

# London Gateway Logistics Park Local Development Order

Design Code







# London Gateway Logistics Park Design Code

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## **Introduction**

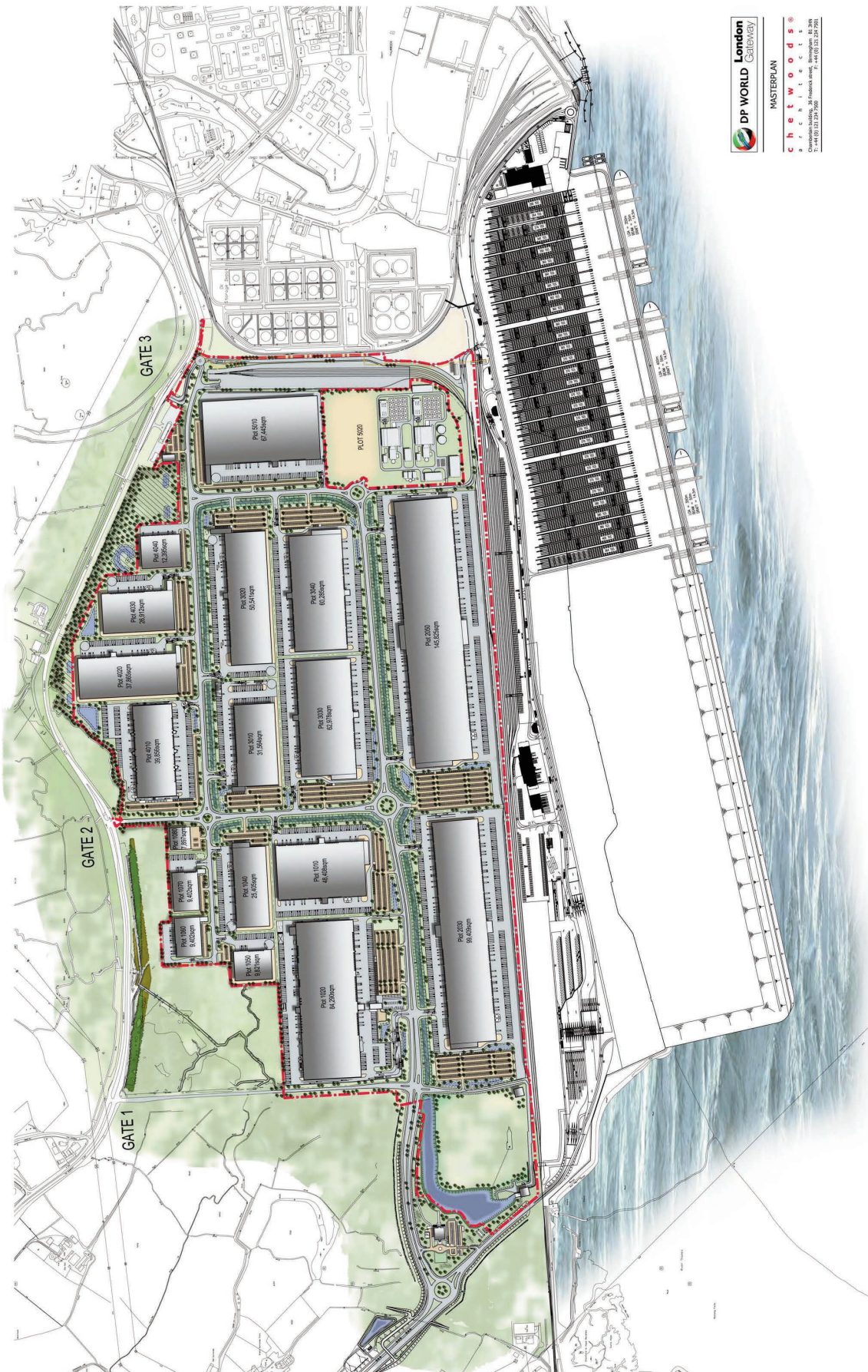
1. The London Gateway Logistics Park Design Code forms part of the London Gateway Logistics Park Local Development Order (LDO) and must be read in conjunction with it.
2. The Design Code sets out the minimum standards to be applied to the building plots, infrastructure and amenity space on site. Its purpose is to ensure that a high and consistent standard of design is maintained throughout the logistics park to provide a sustainable and stimulating working environment whilst at the same time enabling the diverse requirements of individual occupiers to be met.
3. Development must accord with all aspects of the Design Code in order to benefit from the permitted development rights conferred by the LDO.

## **Concept Masterplan**

4. The concept masterplan (see Figure 1) shows an indicative arrangement of routes and spaces that shall provide structure to the logistics park. Strategically located primary infrastructure corridors shall allow a plot-by-plot development of the site. The concept masterplan is intended as a guide only. The layout shall be flexible and responsive to existing and future commercial requirements. The release of plots and associated infrastructure requirements shall be in response to commercial need.
5. Development along the northern boundary shall be characterised by smaller plots of varying depth and buildings restricted in height to no more than 16m to provide a graduation in scale between surrounding areas and the core of the site where larger distribution and industrial buildings up to 42m are to be located. Plots along the southern edge of the Park have the potential to be directly linked to the national rail network and this potential shall be safeguarded as plots are developed.
6. Infrastructure corridors shall accommodate roadways, cycleways and footpaths, and provide service zones for utilities and treated foul and surface water drainage. The positioning of the primary infrastructure will inform the precise location and maximum size of the building plots within the development.
7. The Park shall be accessed via the new London Gateway Access Road to the west of the Site once it is operational. This access road shall also serve the London Gateway Port. Gates 1 and 3 shall provide emergency access to the Manorway for emergency vehicles and buses.
8. Amenity spaces shall be linked by an infrastructure network to create an environment that will, over the lifetime of the development, provide an attractive location for prospective investors and occupiers.



Figure 1: Concept Masterplan



## **Phasing**

9. The rate of development of the logistics park shall be subject to market demand but shall proceed in a controlled and co-ordinated manner in accordance with the Code of Construction Practice (CoCP) and associated legal agreements. Suitable plots to meet commercial requirements shall be released in a manner that does not compromise the delivery of the overall development, reflects the principles of the concept masterplan and enables the necessary supporting infrastructure improvements to be brought forward in a timely manner. On plot landscaping, including that adjacent to infrastructure corridors and the Park perimeter boundaries (with the exception of strategic landscaping north, the implementation of which is dealt with separately in a condition in the LDO), shall be implemented within the first full growing season after building completion or occupation when individual plots are developed. New landscaping shall be maintained and remedial action taken as necessary for 5 years after planting to ensure planned schemes are effectively implemented. Maintenance thereafter shall be continued as necessary to meet the aims of the Landscape Management Plan (see Appendix 2).





# Part 1: Plot Design Standards



## PART 1: Plot Design Standards

### A Plot and Building Design Standards

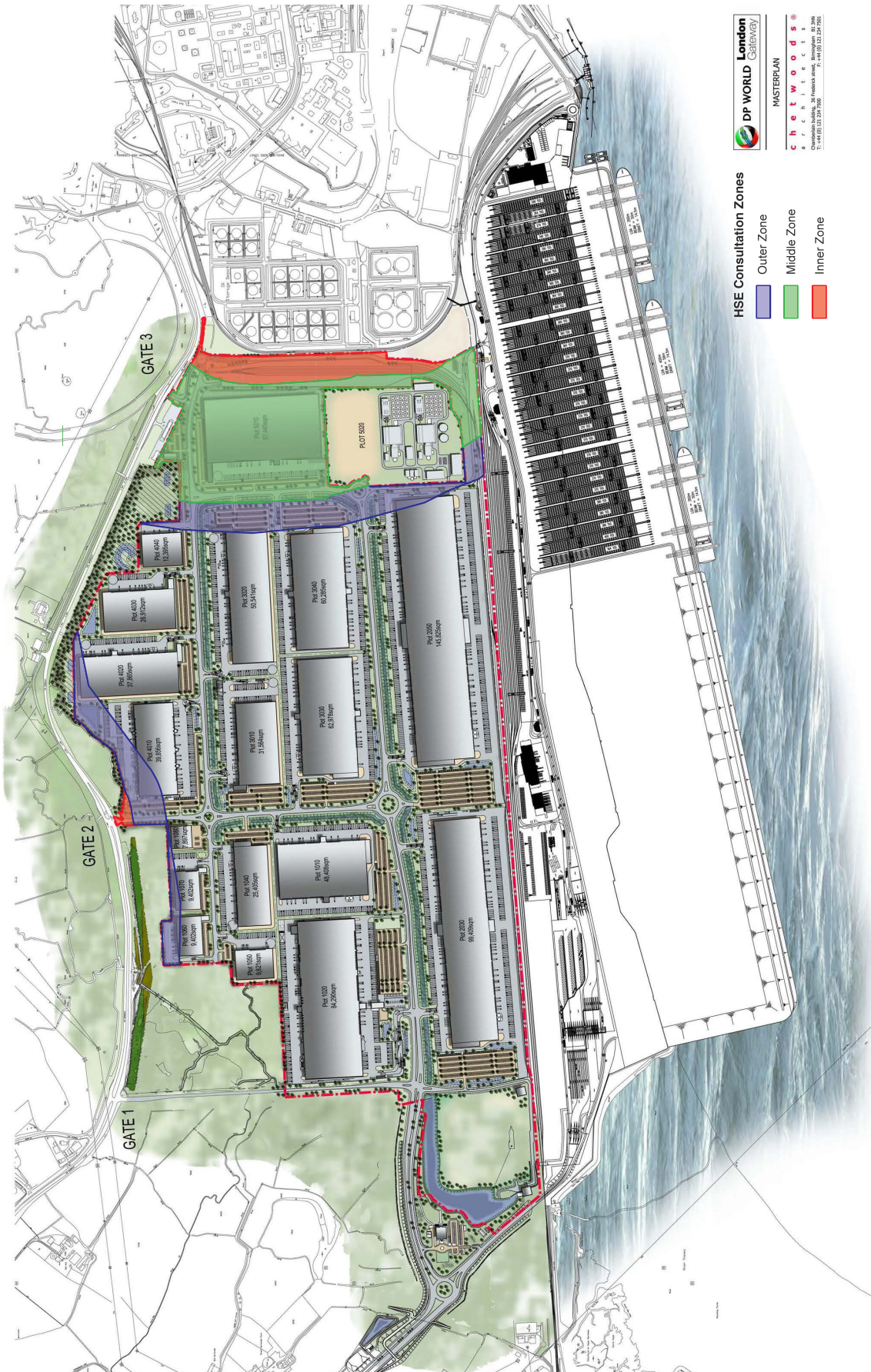
#### A1 Plots

- A1.1 The site shall be developed on a plot-by-plot basis to suit operational requirements.
- A1.2 Building plots shall be based upon standard structural grids of approximately 8m x 32m to maximise material efficiency, co-ordinate with standard warehouse racking systems and ensure an appropriate development density can be achieved whilst maintaining parking, utilities, servicing, and hard and soft landscaping standards.
- A1.3 An area of smaller scale development plots adjacent to the northern boundary shall generally provide sites for units with smaller footprint areas (see paragraph A2.3) and standard, lower clear internal heights. The remainder of the site shall be released for buildings up to 150,000sq.m.
- A1.4 Plots in the Health and Safety Executive Inner Zones (IZ) for the petrol storage site and gas pipelines as shown on Figure 2 shall only be released where:
- the number of occupants in each building is less than 100 and the building has less than 3 occupied storeys.
  - it will be used for parking (cars or HGVs) or rail sidings serving the Park development.
- A1.5 Plots within the HSE middle or outer zone as shown on Figure 2 shall be limited to B8 use.

#### A2 Building Size

- A2.1 The maximum gross internal floorspace of buildings shall not exceed 150,000sq.m.
- A2.2 The minimum gross internal floorspace of buildings shall not be less than 1,000sq.m (unless for ancillary uses).
- A2.3 The gross internal floorspace of Plots adjacent to the northern boundary shall generally be between 1,000sq.m and 50,000sq.m.
- A2.4 'Gross Internal Floorspace' is equivalent to 'Gross Internal Area' as calculated in accordance with the RICS Code of Measuring Practice (sixth edition).
- A2.5 Mezzanine floors shall contribute towards overall gross internal floorspace unless they are solely to provide for safe and efficient access to stacked or stored goods.
- A2.6 Buildings shall maintain a minimum separation distance of at least 8m to the plot boundary.

Figure 2: HSE Consultation Zone



### A3 Height

A3.1 Development shall not exceed the maximum height for the zone/plot in which the building is to be located as shown on the height zoning plan (Figure 4) and shall not exceed the height in AOD set out below:

- 16m zone = 21.1 AOD
- 24m zone = 29.1 AOD
- 28m zone = 33.1 AOD
- 42m zone = 47.1 AOD

A3.2 Building height shall be measured from the warehouse finished floor slab (being generally between 1000mm and 1500mm above external levels to accommodate mechanical handling equipment - see Figure 3). Within this height there will be a clear internal height to haunch, roof pitch and (if required) 1100mm roof edge safety barrier zone. This measurement excludes nominal vent and flue protrusions up to 700mm above roof covering.

#### *Finished Floor Levels*

A3.3 The finished floor level (FFL) within the buildings shall be set between 1000mm and 1500mm above the ground level in the dock levelling bays.

**Figure 3: Building Height**

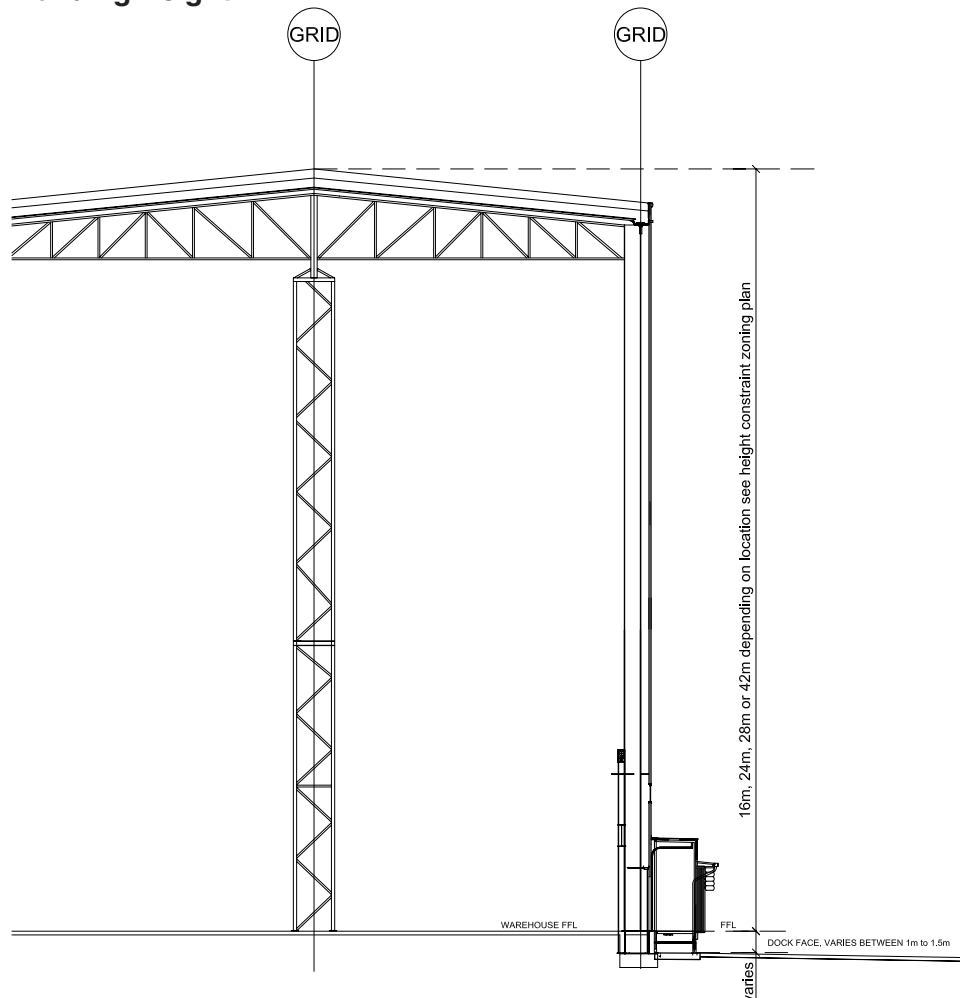
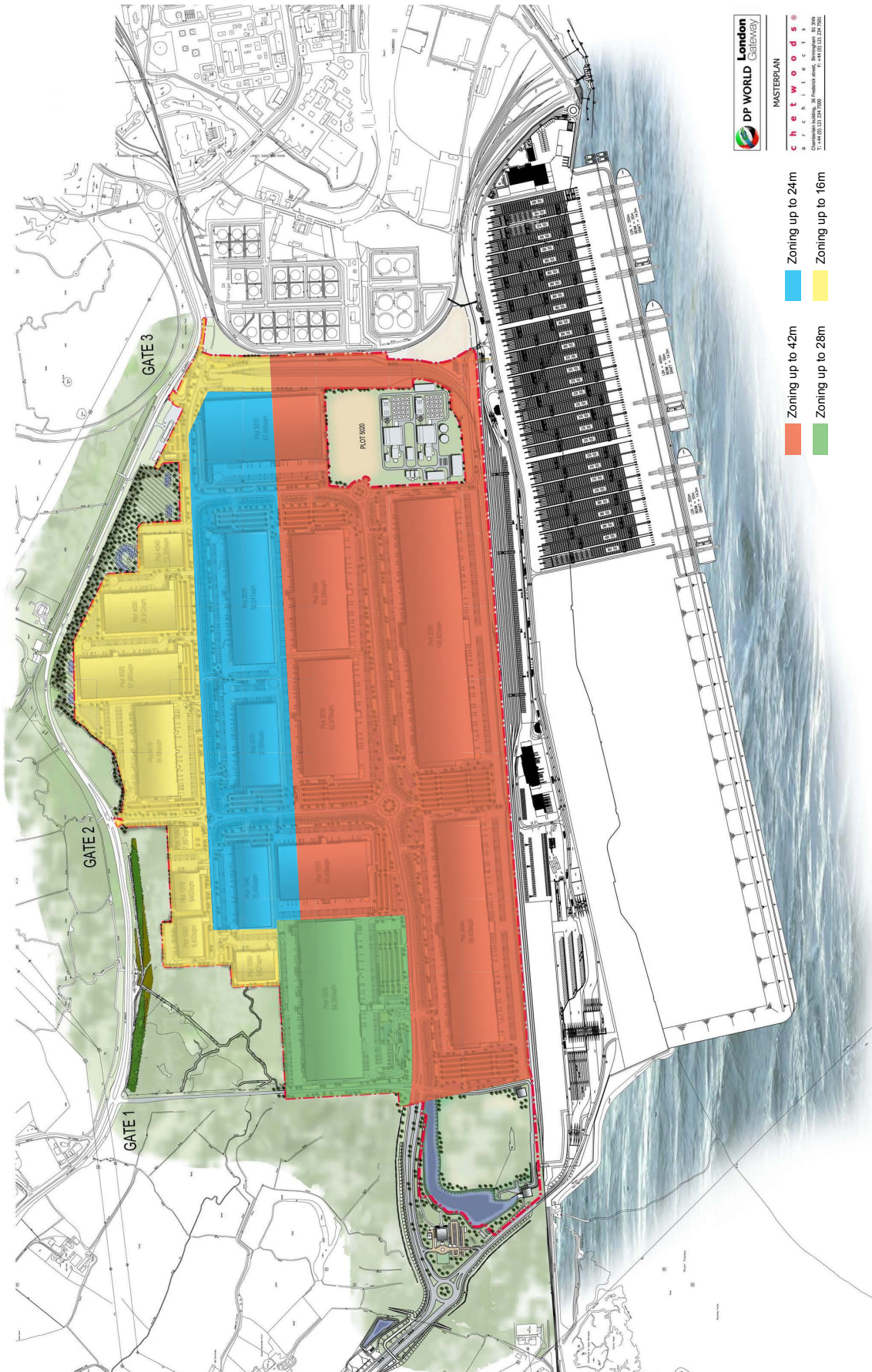




Figure 4: Height Zoning Plan

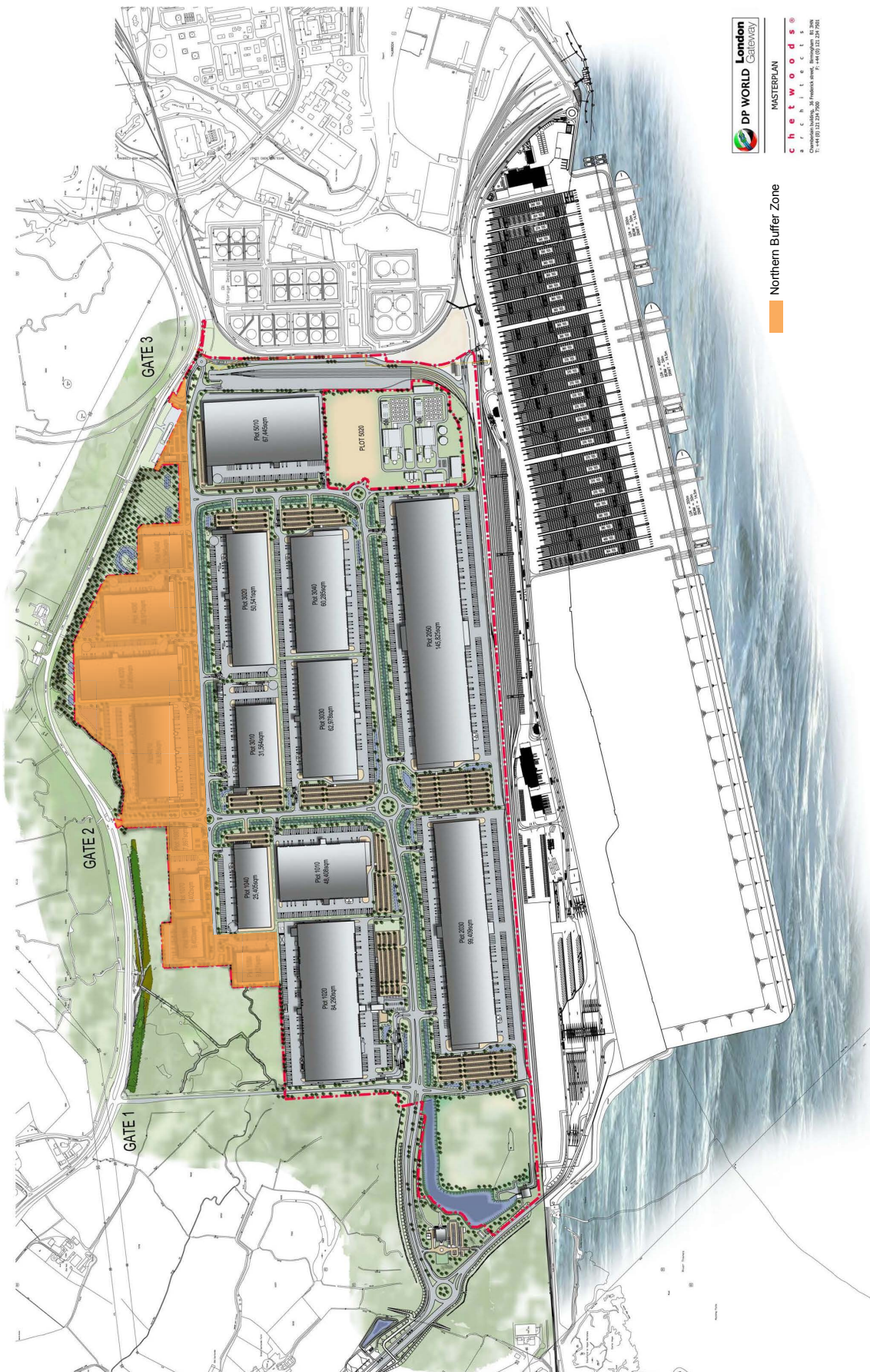




## A4 General Cladding and Roofing Principles

- A4.1 A palette of different materials shall be used in order to achieve articulation and texture in the overall appearance of the area.
- A4.2 The visual impact of the colours and finishes of wall and roof cladding materials shall be considered in relation to the background and context of the building. Commercial buildings will be sited against the Port backdrop of multi-coloured shipping containers, or against the sky on the horizon or otherwise will be viewed in a generally flat and open landscape.
- A4.3 Where buildings over 100,000sq.m are proposed, colours and tones that differ from those of adjacent buildings shall be encouraged to help break up the collective visual mass of a group of buildings and give visual texture to the area when viewed from long distances.
- A4.4 Elevations shall be divided horizontally above the door zone reducing the overall scale of the walls. A minimum of two different cladding profiles laid either horizontally or vertically and two complimenting cladding colours shall be used on both the warehouse and office elevations to achieve a level of consistent elevational treatment around the Park development. Individual occupier operational requirements for canopies over docking bays (if required) shall provide additional articulation of the elevations. Smaller areas of corporate colouration shall be reserved for office elevations fronting onto the internal highway corridors.
- A4.5 Elevations shall be punctuated with a range of coloured sectional overhead loading and access doors either at grade or in conjunction with lowered dock levelled service yards. At least one additional colour shall be selected from a manufacturers standard range of colours to compliment the warehouse cladding colour scheme and tie in with corporate colours on the office elevations.
- A4.6 For buildings in the northern buffer zone as shown on Figure 5, the elevations that face sensitive surrounding areas shall be light in colour and shall reflect the treatment of other elevations as a minimum. The overall massing of the buildings along this zone shall be reduced with the use of barrel vault and/or non-parapet pitched roofs. The use of natural materials such as timber cladding on office elevations shall be encouraged. This design approach, along with the strategic use of landscaping, will allow the buildings to blend in with their surroundings. Elevations that have aspects onto the interior of the site can be of brighter colours to highlight company identity and complement port and introspective views. Where practical, the 'high bay' areas of distribution units shall be orientated towards the centre of the Site.
- A4.7 Large industrial and warehouse units shall typically be constructed from either prefabricated composite insulated metal panels or sheets of profiled steel or aluminium, spanning between primary or secondary steel frames and cladding rails.
- A4.8 External wall cladding shall be either Loss Prevention Council (LPC) certified Grade B composite panels or a built up system with external coating to provide a minimum 25 year guarantee (Confidex or equal). Colours shall be from the standard range set out below, achieving a 'u' value at least in compliance with building regulations.

Figure 5: Northern Buffer Zone



*HPS200 Cladding Finish*

Colorcoat HPS200 Ultra (or similar) with Galvalloy substrate and Confidex Guarantee from Tata Steel Standard colours with a minimum 25 year guarantee from the Signature, Classic and Matt colour ranges (appropriate in coastal locations) shall be selected.

*Prisma Cladding Finish*

Colorcoat Prisma (or similar) with Galvalloy substrate and Confidex Guarantee from Tata Steel Standard colours with a minimum 25 year guarantee from the Solid and Metallic colour ranges (appropriate in coastal locations) shall be selected.

- A4.9 Doors and dock sheltered openings shall be set within a plinth zone of cladding or pre-cast concrete panels designed to withstand or be protected from increased levels of impact damage and toned to integrate with the components at the base of the building and to reduce the overall visual mass of the structure.
- A4.10 Vertical features such as exposed rainwater pipes and panel joints may be used to reduce the horizontal extent of any elevation and provide points of visual reference.
- A4.11 Any extension or alteration to a building shall have a similar external appearance to the existing building.

**A5 Dock Levellers and Level Access Doors**

- A5.1 Dock levellers may be provided in each unit generally at a ratio of 1 per 929sq.m for single sided facilities and 1 per 464.5sq.m for cross-dock facilities. Level access loading doors may be provided at 1 per 4,645sq.m for single sided facilities and 1 per 2,322.5sq.m for cross dock facilities. Ratios within smaller scale units shall be increased to accommodate market demand.
- A5.2 Dock levellers shall be provided, as required, with flexible shelters to minimise the ingress of air and water into the building. Shelters shall generally be black in colour. Insulated sectional overhead doors shall include safety windows and shall be coloured to suit the overall elevational treatment, or reflect corporate identity. The low level position of these features on the elevation shall allow the perimeter landscaping to provide effective screening.

**A6 Ancillary Office Accommodation**

- A6.1 Offices shall be designed to maximise the use of natural ventilation and light. Double depth offices with links into the main warehouse area, where required, would be acceptable.
- A6.2 Ancillary offices shall be positioned on prominent elevations or corners of buildings fronting onto internal highway corridors. Office elevations shall be distinctive to assist legibility for example through the use of entrance canopies or timber cladding. A freestanding office pod may also be provided on-plot provided it is 'purpose designed' to compliment the design of the principal building.
- A6.3 Glazing shall be provided to all floors of the offices. Entrance door sets for staff and visitors may either be combined or separated to suit operational



requirements. Routes to the offices from the car park and footpaths shall be defined.

## **A7 Roofscape and Plant**

A7.1 Roof planes set at low pitches (6 degrees) shall generally be specified with roof lights at 15% where operational requirements permit, to provide natural light to the warehouse. Alternatively equivalent natural light may be provided by the inclusion of some translucent wall panels. Roof mounted plant excluding roof mounted PV, flues and vents shall require screening behind a parapet wall, or integration within office or warehouse components to maintain clean horizontal roofscapes.

A7.2 Roof form and cladding colours should allow for variation in order to disaggregate the mass of roof areas but shall be light in colour. External coating shall provide a minimum 25 year guarantee (Confidex or equal). Colours from the standard range of colours referred to in paragraph A4.8 shall be selected and finished in non-reflective coatings.

### **Fixed Plant**

A7.3 Fixed plants such as chiller units on noise sensitive elements (considered most likely to be offices and restrooms) within and between each plot shall comply with appropriate British standards for these noise sensitive spaces, including BS8233:1999.

A7.4 Chiller units shall be located on the facade of warehouses facing into the site, to prevent a direct line of sight to the closest properties. Where this is not possible, in order to reduce noise impacts at the most affected properties, it is recommended that chiller units and any other ventilation ducts should be limited to less than 85 dB(A) at 1 metre.

A7.5 General working practices shall be put into place to minimise the levels of noise including:

- Awareness training for all staff on noise, particularly noise at night.
- Staff input into methods of improving the noise environment.
- Audit of the noise being generated during operations by foremen and steps taken to enhance the measures to control noise.
- The use of radios for communications instead of verbal instructions.
- Consideration of the use of an alternative to reversing alarms and limits on the use of horns for emergency purposes only.

## **A8 External Building and Site Signage**

A8.1 All signage and advertisements on the Site shall be subject to the Town and Country Planning (Control of Advertisements) (England) Regulations 2007 as amended.

A8.2 Building signage shall be limited to strategic elevations fronting onto the infrastructure corridor where it will inform vehicles and pedestrians on the internal road network.

A8.3 Key signage shall not be permitted above eaves and shall be in scale with the elevations of the building. No display signage unrelated to the corporate name shall be allowed on the building elevations, or within the development site.

A8.4 Development plots shall be signposted within the infrastructure corridors, with occupier signage limited to a position at the thresholds of the site.

A8.5 All illuminated site signage shall incorporate controls to minimise energy consumption and light pollution.

## **A9 Gatehouses**

A9.1 Gatehouses shall be constructed to the material specification or similar standard to that set out in Section A4.8.

## **A10 Sustainable Design Standards**

### **Decentralised, Renewable And Low-Carbon Energy Generation**

A10.1 All development shall be designed so as not to preclude connection to a decentralised, renewable or low carbon energy supply where possible.

A10.2 As a minimum, new development shall provide the following proportions of predicted energy requirements from all sources of decentralised and renewable or low-carbon energy, unless it can be demonstrated that it is not feasible or viable:

- 10% from 2010;
- 15% from 2015; and
- 20% from 2020.

### **BREEAM Standards**

A10.3 Where appropriate buildings shall achieve as a minimum the following BREEAM standards (or equivalent), or other such revised standard as may be included in the Thurrock Core Strategy / Local Plan or other local policy documents:

- BREEAM Very Good up to 2016;
- BREEAM Excellent from 2016;
- BREEAM Outstanding from 2019 (in addition to national standards for zero carbon).

A10.4 These requirements may be relaxed where the developer is able to prove that they are not economically viable, rendering development of the site undeliverable.

A10.5 The above timescales refer to the point at which the prior notification procedure is commenced.

## **B Roads, Parking and Access**

B1.0 The following design standards shall apply to the construction of internal plot access roads, plot-based vehicle parking and servicing.

### **B1 Plot Access**

B1.1 The design of access roads into individual development plots shall comply with the standards for access visibility set out in the Design Manual for Roads and Bridges (DMRB).

B1.2 Pedestrian, cycle and car access to individual plots from the internal site highway network shall be designed to provide separation from goods vehicles and rail routes, for safety and security purposes and to prevent queuing of goods vehicles on the estate roads.

B1.3 Plot accesses onto the road will be a minimum of 90m apart when on the same side of the road.

B1.4 To meet health, safety and security requirements on development plots, footpaths and cycleways shall be terminated at the plot threshold and internal plot layouts shall be designed to accommodate individual occupier requirements whilst maintaining safe routes to the buildings for pedestrians.

B1.5 Security fences or gates shall not obscure sight lines of any junction on the estate roads or any vehicular access to the highway.

#### **Gatehouses**

B1.6 Security gatehouses, or gates to occupier requirements, shall be designed to accommodate incoming queuing goods vehicles whilst maintaining a free flow of cars and cycles to designated parking areas. Security gates or gatehouses at the entrance to individual plots shall be set back to enable at least two HGVs to draw off the highway to avoid queuing on any of the estate roads.

### **B2 Plot Based Vehicle Servicing**

B2.1 The internal plot circulation may be designed to allow cross docking to the larger units and perimeter access for emergency services. Full site circulation shall be maintained on larger units in compliance with Building Regulation requirements.

B2.2 Smaller units may be designed with single sided access and a reduced percentage of perimeter circulation in accordance with Building Regulation requirements.

B2.3 HGV parking and yard circulation areas shall be in accordance with the recommendations of the Freight Transport Association - designing for deliveries (as amended). Typically 16.5m x 3.5m HGV parking space with a 20m pullout/yard circulation zone.

B2.4 HGV circulation on plot shall be designed to allow free flowing circulation to all external areas of the building required by the unit operator, either through the service yards or via a minimum 7.3m wide plot circulation roads.



- B2.5 Where fire escape routes from buildings open onto service yard areas, protected escape steps and refuges shall be provided between lorry docking and parking bays.

#### **HGV Fuel facility**

- B2.6 All areas of hard standing shall be provided with a surface water drainage system fitted with oil and petrol interceptors.
- B2.7 External HGV fuelling facilities shall not exceed a maximum plot coverage of 3% or 3,000sq.m whichever is the lesser. Fuel storage tanks shall be double skinned and may be either below or above ground. Fuelling pumps shall either be open or covered with a canopy with a minimum clear height of 6m and a maximum height to the top of the canopy of 9m and shall be appropriately landscaped. HGV fuelling facilities shall be located in service yards or adjacent to on-plot circulation routes provided they are appropriately screened.

#### **HGV Wash facility**

- B2.8 External HGV wash facilities shall not exceed a maximum plot coverage of 1% or 1,000sq.m whichever is the lesser. Wash facilities may either be open or covered with a maximum height to the top of the enclosure of 7m. However, surface water should be excluded from the wash system, so a covered area would be preferable.

### **B3 Parking Standards**

- B3.1 Individual development plots shall be designed to achieve optimum vehicle parking requirements and to prevent vehicles queuing on the highway while waiting to enter the development plots.
- B3.2 Car parking shall be provided on each plot in accordance with the standards specified in Tables 1 – 4 below and shall be made available for use during the whole of the time that any part of a building is open to any persons employed within the building or to persons visiting the building.
- B3.3 If office accommodation is included in the development then a B1 parking standard shall be applied for that area.
- B3.4 Where a development incorporates two or more land uses to which different parking standards are applicable, the standard appropriate to each use shall be applied in proportion to the extent of the respective use.
- B3.5 The width of standard parking bays with end bays adjacent to solid structures shall be increased by 1m to allow for maneuverability on entry/exit to and from the vehicle. Clear directional marking signs shall be set out using suitable signs and surface arrows.
- B3.6 Landscaping shall be incorporated into parking areas as set out in C4 of this Design Guide.

Table 1: Car Parking Standards for Use Class B1: Business

Use	Vehicle	Cycle	PTW*	Disabled
	Maximum	Minimum	Minimum	Minimum
B1	1 space per 30sq.m**	1 space per 330sq.m for staff	1 space, + 1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	<p><b>200 vehicle bays or less =</b> 2 bays or 5% of total capacity, whichever is greater,</p> <p><b>Over 200 vehicle bays =</b> 6 bays plus 2% of total capacity</p>

\* Powered two wheeled vehicle.

\*\* Parking requirement will be calculated on Gross Internal Area (GIA).

Table 2: Parking Standards for Use Class B2: General Industrial

Use	Vehicle	Cycle	PTW	Disabled
	Maximum	Minimum	Minimum	Minimum
B2	1 space per 50sq.m	1 space per 250sq.m for staff	1 space, + 1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	<p><b>200 vehicle bays or less =</b> 2 bays or 5% of total capacity, whichever is greater.</p> <p><b>Over 200 vehicle bays =</b> 6 bays plus 2% of total capacity</p>

B3.7 In addition to providing parking for disabled drivers as described in the code of practice BS8300:2009 (including amendments), a parking priority scheme for car sharers shall be implemented as required by the LDO Travel Plan. Space for people with disabilities shall be located adjacent to entrances and shall be marked with lines and the International Symbol for Access.

Table 3: Parking Standards for Use Class B8: Storage and Distribution

Use	Vehicle	Cycle	PTW	Disabled
	Maximum	Minimum	Minimum	Minimum
B8	1 space per 150sq.m	1 space per 560sq.m for staff	1 space, + 1 per 20 car spaces (for 1st 100 car spaces), then 1 space per 30 car spaces (over 100 car spaces)	<p><b>200 vehicle bays or less =</b> 2 bays or 5% of total capacity, whichever is greater.</p> <p><b>Over 200 vehicle bays =</b> 6 bays plus 2% of total capacity</p>

Table 4: Car Parking Bay Dimensions:

Standard	2.5m x 5.0m
Disabled/Special Needs	3.6m x 4.8m

## B4 Lorry Parking

B4.1 HGV parking shall be based on operational requirements. Parking bay dimensions shall be in accordance with the standards set out in Table 5.

Table 5: Lorry Parking Bay Dimensions:

Minimum for Vans	3.5m x 7.5m
Minimum for HGVs	
Articulated	3.5m x 16.5m
Rigid	3.5m x 12.0m

B4.2 There shall be no parking on estate roads.

B4.3 For development in excess of 30,000sq.m where 24-hour operation is required, adequate welfare facilities shall be provided within the plot for drivers of commercial vehicles at a rate of one driver/commercial vehicle per 3,500sq.m. If such facilities are unable to be provided on plot (or if there is a shortfall in on plot provision), alternative facilities shall be provided off-plot at an equivalent rate.

## B5 Cycle Parking

B5.1 All cycle parking shall:

- be secure and covered;
- be conveniently located adjacent to entrances to buildings;
- enjoy natural observation;
- be easily accessible from roads/and or cycle routes;
- be well lit;
- be located so not to obstruct pedestrian and cycle routes.

B5.2 Sheffield stands or similar shall normally be provided. Provision shall be made for lockers, changing and shower facilities. The location, type and dimensions for cycle parking shall accord with the Essex Parking Standards 2009 or other such standards adopted by Thurrock Council.

B5.3 Cycle stands shall be manufactured in galvanized steel or brushed grade 316 stainless steel and root fixed below ground. They may include a horizontal bar for additional strength and security and should allow for two bikes per unit and be of hooped form.



B5.4 Cycle shelters shall be manufactured using a galvanized steel frame with galvanized steel, powder coated steel, laminated or tempered safety glass or FSC timber infill and roof panels. Where appropriate shelters shall include lighting elements to ensure safety and visibility for users.



## B6 Materials

B6.1 Materials for road construction shall be compliant with the appropriate British Standard or other relevant specification.

B6.2 Development plot entrances shall be concrete, block paving or asphalt.

- B6.3 Standard profile concrete kerbs shall be used adjacent to footpaths / cycleways and within car parking areas. High profile concrete kerbs shall be used within areas susceptible to HGV damage.
- B6.4 Road marking and parking bays shall be demarcated in white or yellow thermoplastic paint and kerbs shall be used to provide protection to pedestrian areas and prevent damage to landscaped areas by vehicles.
- B6.5 When available, suitably recycled, locally sourced or 'green energy' materials shall be used where these conform to the necessary standards and will meet the necessary performance standards or specification.

## **B7 Standards for Footpaths and Cycleways**

- B7.1 Shared use footways/cycleways shall be a minimum width of 3m.
- B7.2 Where footways/cycleways are liable to vehicle over-run, materials shall be restricted to:
- Bituminous materials to DMRB standards unless there is a need to match existing paths surfaced with Hot Rolled Asphalt (HRA).
  - Resin bound material - Highways Authorities Product Approval Scheme (HAPAS) certified with a minimum design life of 25 years.
  - Where appropriate, concrete block paving, including tumbled blocks, 100mm x 200mm x 80mm.
- B7.3 Where the footway will not be over run or otherwise damaged by vehicles the following paving may be used in addition to that noted above.
- 400mm x 400mm x 65mm standard concrete paving slabs.
  - 400mm x 400mm x 65mm textured concrete paving slabs.

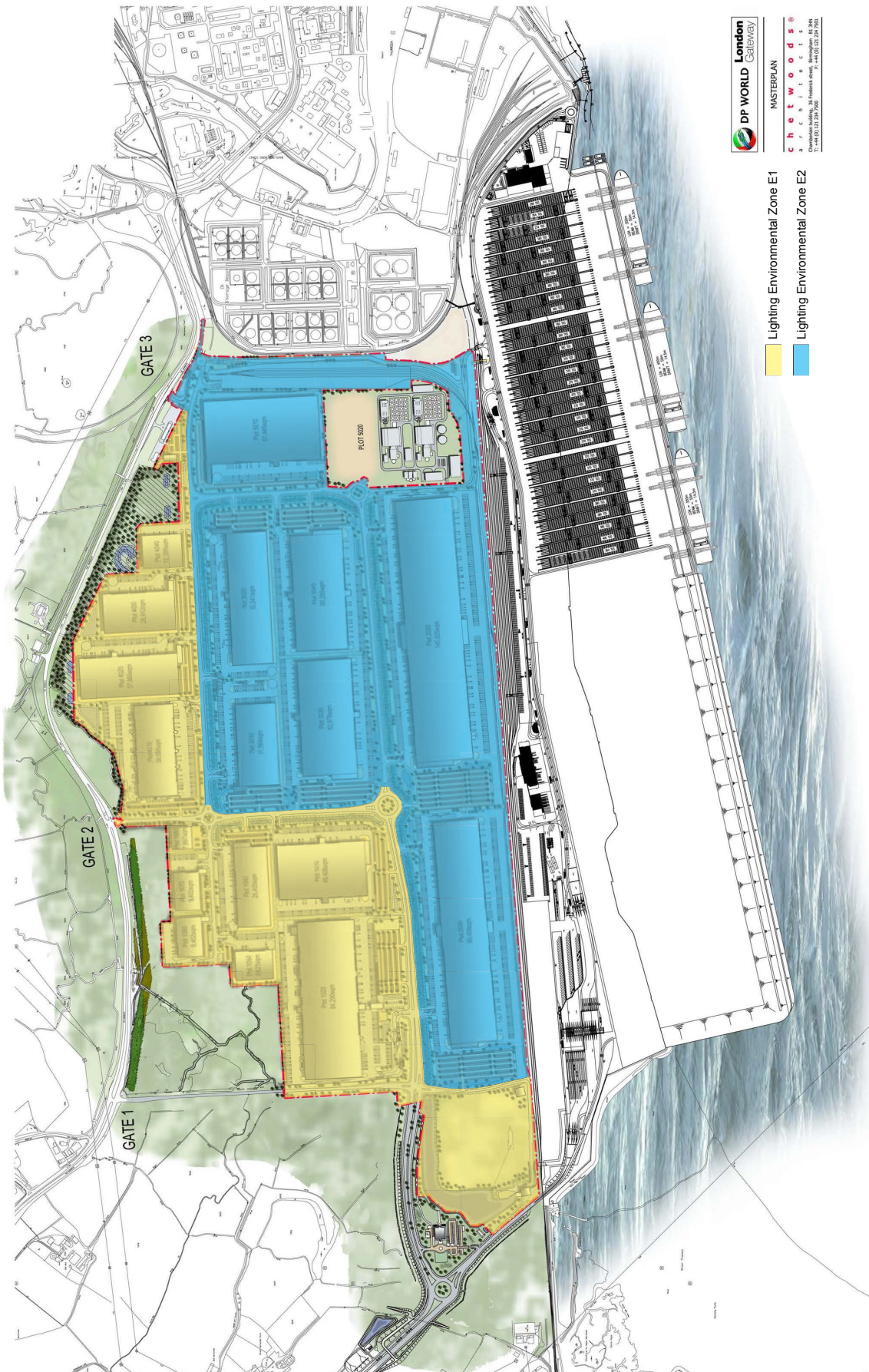
## **B8 Lighting**

### **General Considerations**

- B8.1 The following standards apply to all exterior lighting across the site. References to lighting equipment are indicative and may be amended subject to achieving the stated performance requirements.
- B8.2 Lighting equipment when installed, shall meet the lighting constraints defined in ILP Guidance Notes GN01 for the control of obtrusive light for the Environmental Zone applicable to the location of the site (see Figure 6). Additional care shall be taken to minimise light spill and glare from any lighting installed by ensuring the correct luminaire is selected and installed correctly in line with the recommendations within CIE 150 (2003) and ILP GN01. The design shall ensure the mounting heights employed are the minimum necessary to achieve the lighting performance requirements. Illuminance levels shall not exceed 1.0 lux at 25m and 0.1 lux at 50m from the perimeter site boundary to the Park. The management company, London Gateway Services Limited (LGSL), shall monitor illuminance levels at 50m intervals at points 25m and 50m from the northern and western perimeter site boundaries on at least one occasion between 1 November



Figure 6: Lighting Environmental Zones





and 1 March each year and report their findings to the Environmental Advisory Group (EAG). LGSL shall take whatever steps necessary to ensure compliance with the standards set out above. In the event that any remedial action is required, LGSL shall undertake a further round of monitoring within 14 days of any breach being identified to demonstrate to the satisfaction of the EAG that the standards are being complied with.

- B8.3 The lighting units shall be controlled so that they can be dimmed or switched off in defined work areas should operational conditions allow, subject to Health and Safety requirements, for example staff parking areas outside of shift change times. All lighting may be operated at full output throughout the hours of darkness.
- B8.4 Lighting within the development shall use white light sources with a Colour Rendering Index, Ra >60 throughout. For the purpose of standardising maintenance spares, the lighting units shall be fitted with Philips CPO-TW CosmoPolis ceramic metal halide lamps or similar.
- B8.5 The use of LED lighting may be a viable alternative to the CosmoPolis lamp in some situations on the condition that it is able to achieve an equivalent photometric performance within a luminaire having similar aesthetics to those proposed in the following sections. This particularly applies where the Urbis Furyo range of lanterns is to be used.

#### **Lighting Controls**

- B8.6 The exterior lighting shall be remotely controlled and monitored by a Central Management System (CMS) such as the Harvard Engineering Leafnut/Lucy Zodion Vizion or similar.

#### **Power Distribution**

- B8.7 The exterior lighting shall be supplied by a private cable network fed from feeder pillars mounted externally or from distribution panels within the buildings. Cabling shall be installed in buried ducts.
- B8.8 Where lighting units are mounted on walls of buildings, cabling shall be installed within corrosion and impact resistant conduit or trunking.
- B8.9 Power supplies and cabling for lighting within the Park shall be fully segregated from Thurrock Council owned lighting equipment.
- B8.10 Columns should be mounted a safe distance from carriageways for maintenance access, free pedestrian and cycle passage and to reduce collisions in accordance with the requirements of clauses 3.3 and 3.4 respectively of TD 34/07 of the DMRB.

#### **Lighting Classes**

- B8.11 The lighting classes for roads, footways and cycleways shall be as set out in BS 5489-1: 2013 Code of Practice for the Design of Road Lighting – Part 1: Lighting of roads and public amenity areas, or as subsequently modified, and BS EN

13201:2003 Road Lighting. The lighting classes for outdoor work areas would be as set out in BS EN 12464-2:2007 Light and Lighting – Lighting of workplaces; Part 2: Outdoor work places.

### **On Plot Circulatory Roads**

#### *Performance Requirements*

B8.12 The lighting of on plot circulatory roads shall be designed to lighting class S2. The performance requirement applying a S/P ratio of 1.2 is:

Average illuminance, Eav:	10.0 to 15.0 lux
Minimum illuminance, Emin:	2.0 lux minimum

B8.13 This level can be further reduced dependent upon the Ra value and the S/P ratio of the lamp in accordance with Clause A 3.3.3 of BS5489-1: 2013.

#### *Equipment Details*

B8.14 Luminaire and lamp:	Urbis Furyo 2 lantern or equivalent with 90W CPO-TW
Lighting column and bracket:	Urbis FLO column and Bracket or equivalent of 8m maximum height.
Mounting attitude:	Zero inclination

#### *Installation Geometry*

B8.15 Single Carriageway: Lighting columns shall be mounted in a single sided arrangement at the rear of the cycleway/footway at a nominal longitudinal spacing of 22m.

### **Lorry Docking and Loading Areas**

B8.16 The lighting shall be in accordance with HSG 38, and 5.1.4 and 5.7.2 of BS 12464-2: 2007.

### **Lorry Docking and Loading Areas**

#### *Performance Requirements*

Average illuminance:	50 lux
Overall Uniformity, Uo:	0.40
Glare Rating Limit, GRL:	50

B8.17 Glare to a driver reversing a vehicle shall be avoided and shadowing caused by the vehicle load shall be considered. Glare visible outside the perimeter site boundary of the Park shall be avoided

#### *Lighting Arrangement*

B8.18 Lighting units shall be mounted on the wall of the building. The lighting arrangement for a typical docking and loading area is shown on Figure 7. Building

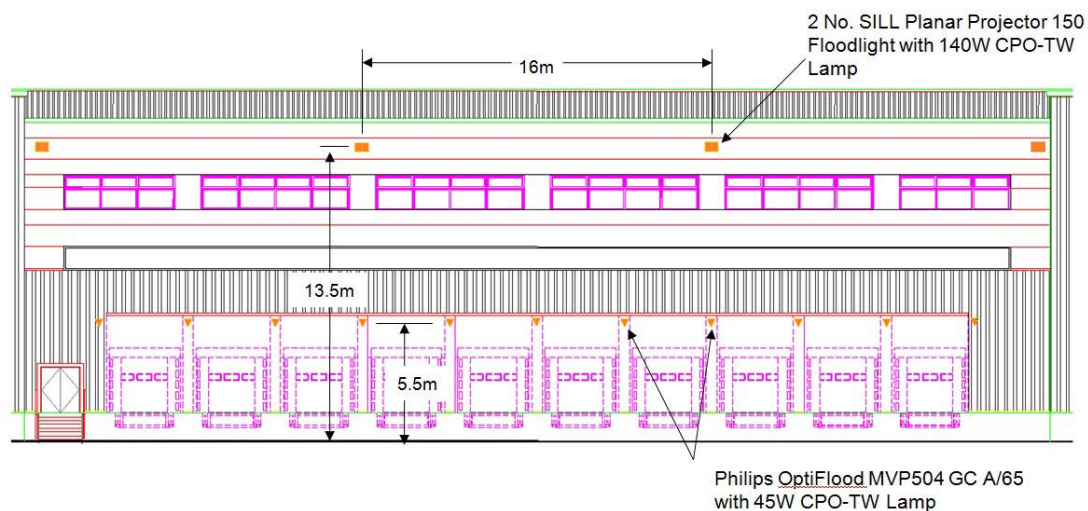
mounted luminaires shall be at the lowest height to achieve the necessary illuminance / uniformity criteria. Care shall also be taken to ensure the luminance of building facades, taking into account the final cladding finish and reflectance, does not exceed that set out within ILP Guidance Notes for the Reduction of Obtrusive Light GN01:2011 for the relevant Environmental Zone.

B8.19 The lighting shall comprise Philips OptiFlood MVP504 GC A double asymmetric floodlights, or equivalent, with 45W CPO-TW lamps or similar mounted at a maximum of 5.5m height between each docking gate.

B8.20 This lighting shall be supplemented by SILL Plane Projector 150 floodlights, or equivalent as approved, with 140W CPO-TW lamps or similar, mounted at high level on the building at a maximum height of 15m. The floodlights shall be mounted in pairs at a nominal spacing of 16m between each group of floodlights. All floodlights shall be mounted with their glazing horizontal to avoid emitting any light directly into the sky.

B8.21 In addition to the fixed exterior lighting, local adjustable lighting shall usually be provided at the docking gate within the building. This shall be switched locally and shall not operate once the docking gate is vacated.

**Figure 7: Lighting arrangement at typical loading dock**



## Distribution and Circulation Areas

### *Performance Requirements*

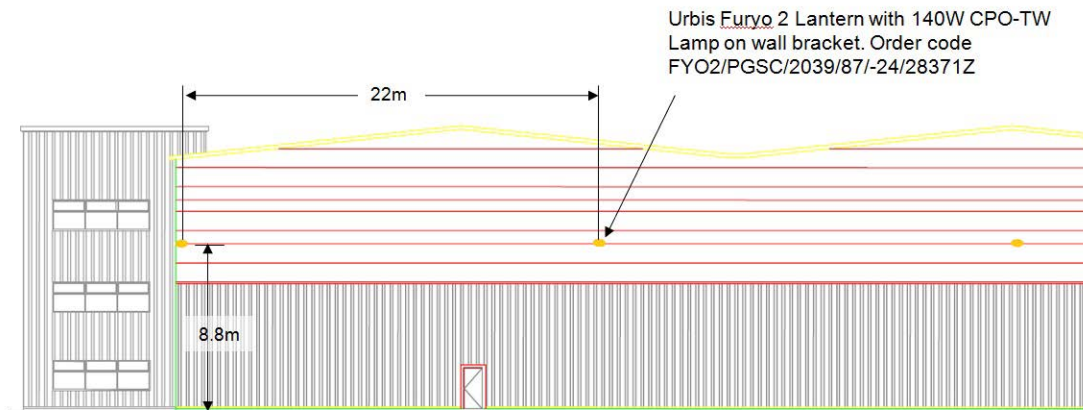
B8.22 The lorry circulation routes shall be lit to an average illuminance of 20 lux with a minimum overall uniformity of 0.40 in accordance with 5.1.3 of BS 12464-2: 2007.

### *Lighting Arrangement*

B8.23 Where the circulation route lies between the HGV parking area and the loading dock area, the lighting installed for those areas shall also provide sufficient lighting of the circulation route.

- B8.24 Where the circulation route is adjacent to warehouses, Urbis Furyo 2 road lanterns or equivalent with 140W CPO-TW lamps may be mounted on wall brackets attached to the building at a height of 8m – 9m and at a spacing of 22m as indicated on Figure 8.

**Figure 8: Wall mounted lanterns**



- B8.25 Where there is no building directly adjacent to the circulation route, Urbis Furyo 2 road lanterns or equivalent, with 140W CPO-TW lamps, shall be mounted on columns of 8m maximum height from the Urbis FLO range with brackets from the FLO range to match the style of lighting units employed on the access roads and car parks.
- B8.26 For very wide circulation areas, the lighting shall be provided by SILL Plane Projector 150 floodlights or equivalent with 140W CPO-TW lamps on 10m columns as proposed for the lorry parking areas.

### **Weighbridges and Fuelling Areas**

#### *Performance Requirements*

- B8.27 The level of lighting in these areas shall be increased compared to that on the general circulation areas. For the fuelling areas it may be necessary to use equipment rated for use in hazardous zones due the presence of explosive vapours unless the lighting is located outside of the hazardous zone. Lighting for specific tasks within these areas shall comply with the requirements of Table 5.6 of BS 12464-2: 2007.

Average illuminance:	50 lux
Overall Uniformity, U <sub>o</sub> :	0.40
Glare Rating Limit, GRL:	50

#### *Lighting Arrangement*

- B8.28 The lighting shall be provided by columns of 10m maximum height with single or twin SILL Plane Projector 150 floodlights or equivalent with 140W CPO-TW lamps.



## Gatehouses

### *Performance requirements*

- B8.29 Gatehouses shall be lit to an average illuminance of 100 lux at ground level with a vertical illuminance at the level of the vehicle driver. Gatehouse security lighting shall be in accordance with the recommendations provided in sections 18.3 and 18.4 of the CIBSE SLL Lighting Handbook (2009) as may be amended.
- B8.30 The entrance shall be lit by multiple luminaires so that the loss of one luminaire will not seriously degrade the lighting available to the guard on duty. The lighting shall be positioned to enable sufficient illumination for the guards and CCTV to see the number plates of vehicles approaching the entrance.

### *Lighting Arrangement*

- B8.31 The proposed lighting shall comprise lighting columns of 8m maximum height with 4 no. SILL Plane Projector 150 floodlights or equivalent equipped with 140W CPO-TW lamps. The floodlights shall be mounted with their glazing horizontal to provide a full cut-off of light above the horizontal. Consideration shall be given to providing back-up power supplies for these lighting units in the event of a power outage.

## Car and Van Parking Areas

### *Performance Requirements*

- B8.32 The lighting of the car and van parking areas shall meet the requirements in Table 5 of BS 5489-1 for outdoor car parks with heavy traffic.
- B8.33 The performance requirements shall be as follows:

Average illuminance, Eav:	20 lux
Overall Uniformity, Uo:	0.25 minimum

### *Equipment Details*

Luminaire and lamp:	Urbis Furyo 2 lantern or equivalent with 90W CPO-TW
Lighting column and bracket:	Urbis FLO column or equivalent with single and twin bracket arm of 8m maximum height.
Mounting attitude:	Zero inclination

### *Installation Geometry*

- B8.34 Lighting columns shall be mounted around the perimeter of a car park and where necessary, within the central area of the parking area. Figure 9 shows a typical arrangement. Where lighting columns are located within the central area they shall be generally located on the raised islands at the end of parking space rows, or where it is necessary to position them between parking spaces, with barrier protection to protect vehicles manoeuvring into them.

**Figure 9: Typical car park lighting layout using 8m high single and twin-arm columns**



### Lorry Parking Areas

#### *Performance Requirements*

- B8.35 The illuminance requirement shall be for 20 lux average and 5 lux minimum in accordance with “HSG 38 – Lighting at work” (HSE 1997).
- B8.36 The lighting columns shall be positioned such that they will not be vulnerable to impact from HGVs reversing into the parking space and will not obstruct the tailgate of the trailer unit. They shall not cause glare visible outside the perimeter site boundary of the Park.

#### *Lighting Arrangement*

- B8.37 The lighting shall comprise columns of 10m maximum height positioned at the rear of the parking area and located centrally between parking spaces at a maximum separation of 5 parking spaces, which equates to a spacing between columns of 17.5m. Each column shall support a SILL Planar Projector 453 floodlight or equivalent equipped with a 140W CPO-TW lamp. The floodlights shall have a double asymmetrical intensity distribution and shall be mounted with their glazing horizontal to provide a full cut-off of light above the horizontal.

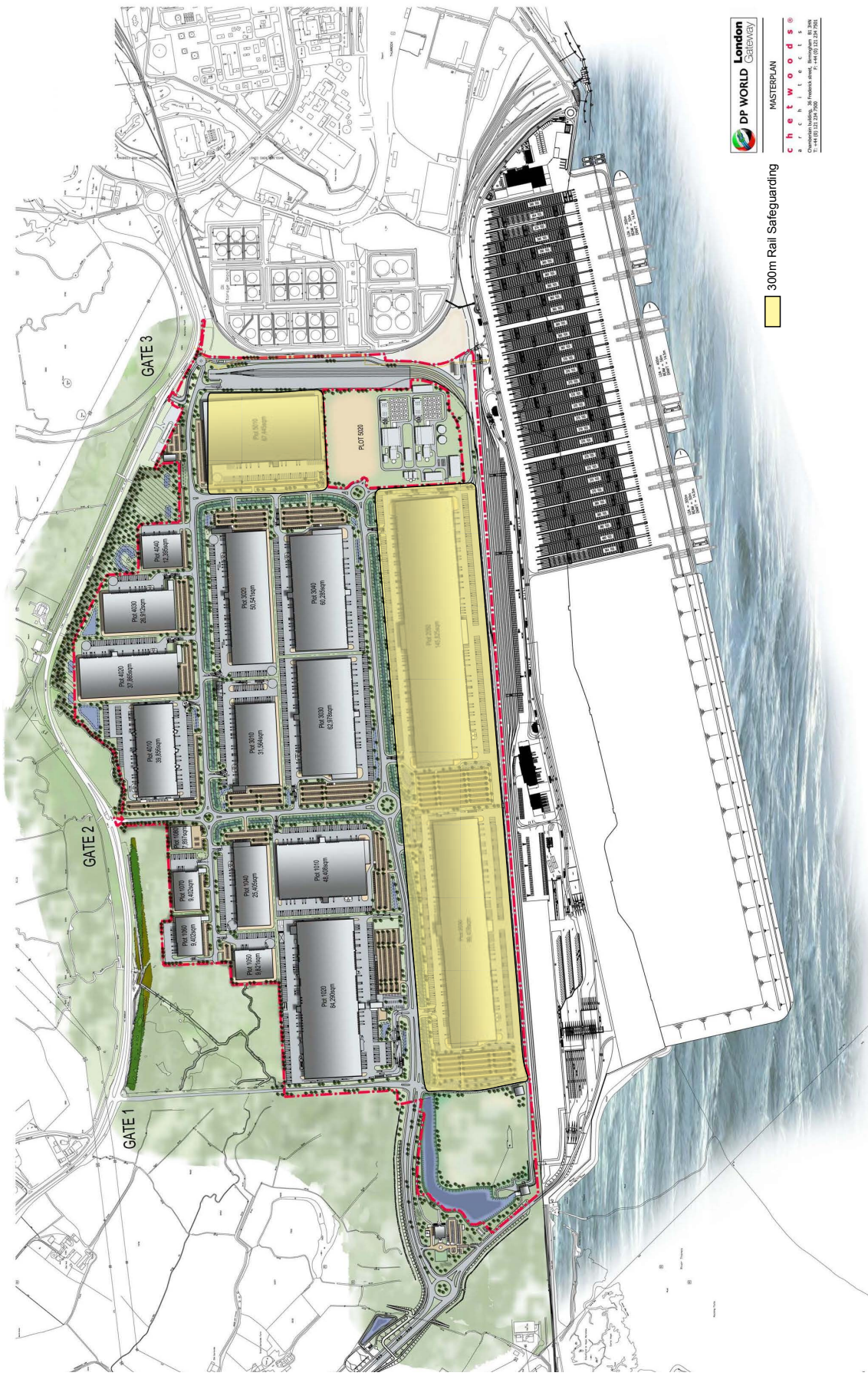
### Boundary Security Lighting

- B8.38 Security lighting shall be in accordance with the principles and guidance detailed in Chapter 18 of the CIBSE SLL Lighting Handbook (2009) as may be amended.

#### *Performance Requirements*

- B8.39 The lighting provided for security at boundary fences for secure areas shall provide an average illuminance of 5 lux with an overall uniformity of 0.1 at ground level on either side of the fence. Light sources with a colour rendering index, Ra, of at least 0.6 shall be used to provide good identification of colours. As set out

Figure 10: Area within which 50ha of land is to be safeguarded for Rail Access





at B8.2, illuminance levels shall not exceed 1.0 lux at 25m and 0.1 lux at 50m from the perimeter site boundary to the Park.

*Lighting Arrangement*

B8.40 Where buildings and other obstructions result in dark shadowing along the boundary, security lighting shall be provided by lighting columns of between 5m and 8m high with Furyo lanterns equipped with CPO-TW lamps or equivalent up to 140W maximum power rating. The exact column height and lamp combination shall be dependent on the geography of the site and the type of fence construction; 5m high lighting units shall generally be satisfactory.

**B9 Plot-by-Plot Rail Connection**

B9.1 No development shall take place within an area comprising not less than 50ha of land situated within a zone 300 metres from either the Thameshaven Branch Line or the Common User Siding (see Figure 10) without provision having been made for rail access to the national rail network via the Thameshaven Branch Line (whether directly or via the Common User Siding). No development shall take place within the site which would prejudice the provision of such rail access.



## C Landscaping

### C1 Street Furniture

C1.1 Street furniture (e.g. seating, cycle storage etc.) shall be in accordance with requirements set out at Part 2, Section I3 of this document.

### C2 Boundary Treatments

C2.1 Individual occupiers shall be responsible for on site security of their development plots. Fencing to the perimeter of each plot shall be designed to be unobtrusive within the perimeter of the landscaped zone, with the minimal amount of impact on landscaping.

C2.2 Car parks to individual plots shall be designed to provide an element of natural surveillance allowing views from the road. Pedestrian, cycle and car access to individual plots from the highway network shall be designed to provide separation from goods vehicles and rail routes.

C2.3 The height of perimeter fencing shall be a maximum of 3m above ground level and shall typically be:

- BS1722-12 Steel Palisade Fencing; and
- BS1722- 14 Open Mesh Steel Panel Fencing Category 1 (General Purpose) and Category 2 (Security) Fencing.

C2.4 Posts and struts for all fences shall be manufactured from Black RAL9005 powder coated galvanised steel and secured with concrete foundations. All fixings and straining devices shall be zinc coated.

C2.5 All Steel Palisade fencing shall have pale tops shaped in accordance with BS1722-12. Fencing shall not have cranked arms, barbed tape concertina or barbed wire entanglement topping.

C2.6 Fencing shall closely reflect the ranges specified below:

#### Manufacturer

Total Security Solutions ([www.total-fencing.co.uk](http://www.total-fencing.co.uk)) Palisade Fencing

Betafence ([www.betafence.co.uk](http://www.betafence.co.uk)) Paladin® Classic



C2.7 Other boundary demarcation requirements shall be determined in response to the individual needs of each phase. All boundary demarcation barriers throughout the development shall be constructed in accordance with BS guidance.

C2.8 Typical systems to be used across the development shall include:

- Wooden knee rail fencing;
- Car park barrier controls;
- Galvanised steel pedestrian barriers;
- Automated sliding gate systems;
- Timber demarcation bollards;
- Timber post and wire fencing;
- Timber post and rail fencing.

C2.9 All timber elements shall be FSC certified. Finishes to metal elements shall be manufactured in Black RAL 9005 powder coated galvanised steel unless for hazard demarcation or similar.



### C3 Feature Elements

C3.1 Lighting for landscaped areas for aesthetic effect may be provided. Examples of suitable products are shown below in Table 6.

C3.2 Feature lighting shall take account of the relevant lighting Environmental Zone classification of the plots location and be limited to the main entrance areas of plots and buildings.

C3.3 Colour and finish of lighting equipment shall be considered in the context of the environmental surroundings. The use of highly reflective finishes shall be avoided where these could cause a traffic hazard.

Table 6: Lighting Equipment

Product Image	Equipment Details	Typical application
	iGuzzini iWay 1m high bollard with integral control gear and 1 35W G12 HIT lamp. Product code B465+B513 or equivalent	Staff exterior seating areas and informal footpaths.
	iGuzzini Light Up Balisage ground recessed luminaire with integral driver and 1.8W warm white LEDs. Product code BD77+5935 or equivalent	Way guidance.
	iGuzzini Mini Woody surface mounted spotlight with integral driver and 3 x 1W warm white LEDs. Product code B591+B989 or equivalent	Tree uplighting and feature lighting.
	iGuzzini Ledstrip Tube LED tape. Product code M826+MWG1 or equivalent	Coloured beading on building facades.

## C4 Soft Landscaping

- C4.1 The on-plot soft landscaping scheme shall comprise tree planting, native and ornamental species shrub planting and seeding. The size of nursery tree stock shall range from transplants to semi-mature size and include a range of native and ornamental species suitable to the site conditions and selected to optimise wildlife benefit and potential for habitat creation.
- C4.2 A range of tree species shall be used that have a variety of canopy forms, leaf textures, seasonal colour and growth habits.
- C4.3 The planting schemes shall take into consideration the required visibility for users of internal roads and pedestrians.
- C4.4 On each individual plot, a minimum perimeter landscape width of 10m shall be provided adjacent to the infrastructure corridors and 5m (including a 0.75m gravel margin) to adjacent plots (see Figure 11). Security fencing along this zone to infrastructure corridors shall be towards the plot side of the landscape strip.
- C4.5 Where adjacent to car parks, landscaping shall include both native understorey and woodland planting (see Figure 12). Where screening delivery yards, landscaping shall be entirely native woodland planting (see Figure 13).

Figure 11: Landscaping for Plot to Plot boundaries

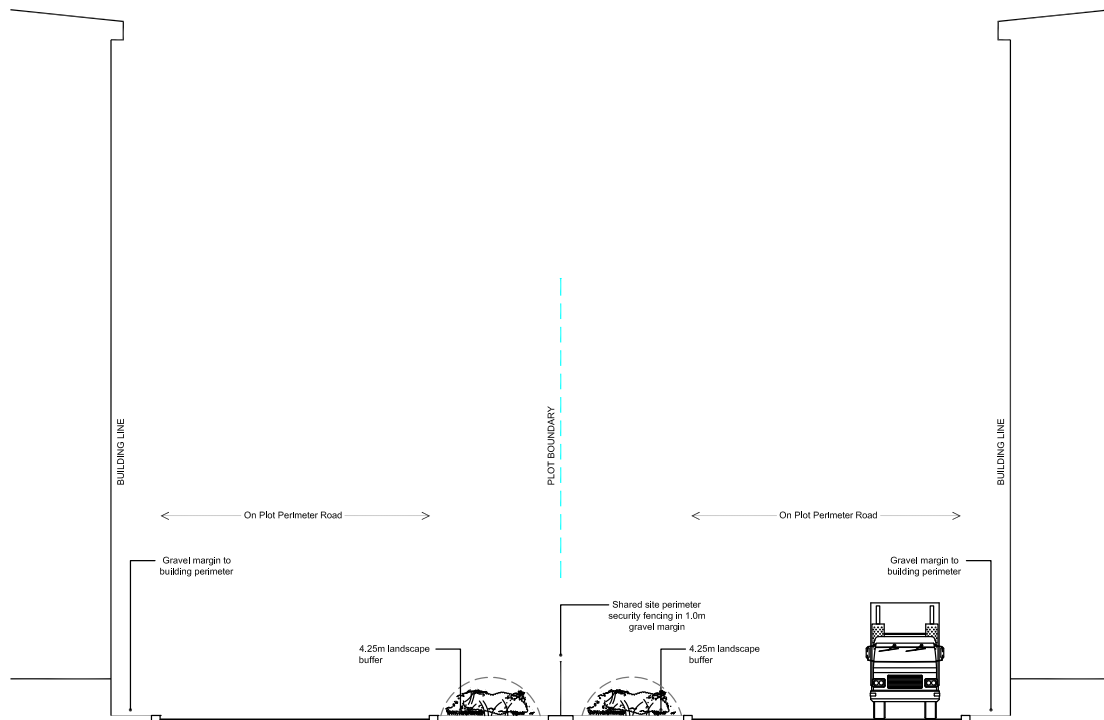


Figure 12: Landscaping between Plot Car Parking and Infrastructure Corridors

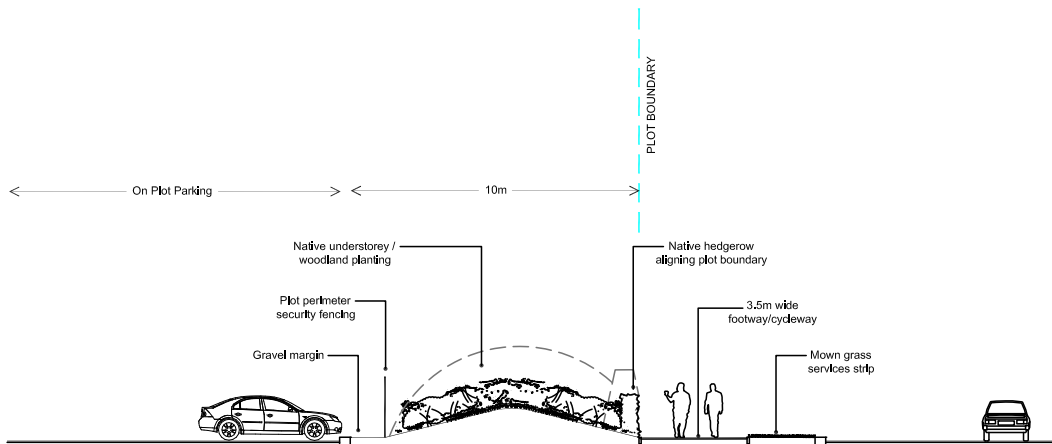
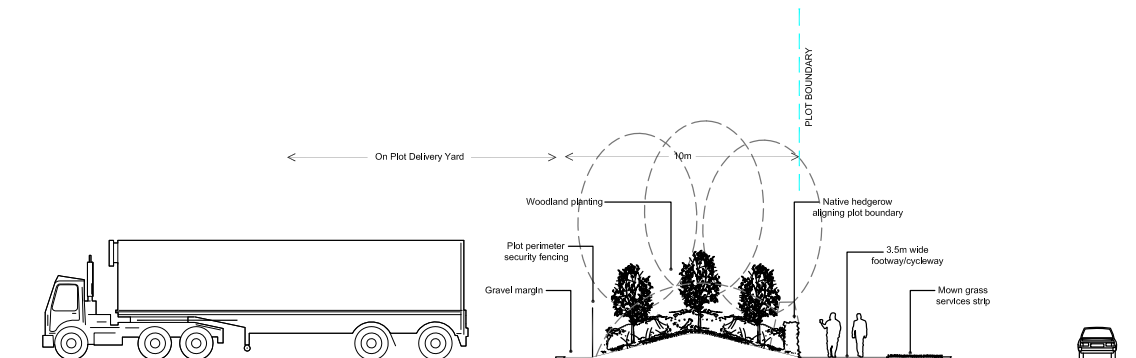


Figure 13: Landscaping between Delivery Yards and Infrastructure Corridors





- C4.6 Ornamental shrub, herbaceous and specimen tree planting shall be included within car parking areas.
- C4.7 Development plots shall be tied into the existing landform along their edge at a gradient not exceeding 1:3. To help screen delivery yards and built form, the re-graded slopes shall be aligned along their upper edge by standard trees in a native hedgerow. Understorey and woodland planting shall also be established on a minimum 50% of the remaining slope area.
- C4.8 The soft landscaping scheme for each plot shall be implemented within the first full growing season after building completion or occupation whichever is the sooner. New landscaping shall be maintained and remedial action taken as necessary for five years after planting. Maintenance thereafter shall continue in accordance with the Landscape Management Plan (Appendix 2).
- C4.9 The soft landscaping scheme for plots shall comply with the detailed soft landscaping specification set out at Appendix 1.
- C4.10 Plant species in general will include (but will not necessarily be restricted to) those listed within Appendix 1.

## **C5 Landscape Management Plan**

- C5.1 A coherent, strategic and integrated approach to the management and maintenance of the soft landscape components associated with the development, shall be adopted in accordance with the Landscape Management Plan set out at Appendix 2 to ensure the successful establishment of vegetation and overall integration within the surrounding landscape.

## **C6 External Finishes**

- C6.1 External finishes shall generally be a selection of concrete, tarmacadam or block paviors / paving slabs with road marking and parking demarcated in white / yellow thermoplastic paint. Parking areas shall generally be constructed of semi-permeable paving where practical. Areas of soft landscaping within the development plots shall be designed with kerb protection to prevent damage caused by vehicles.
- C6.2 High profile kerbing shall be specified within areas susceptible to HGV damage. Landscaping located within car parking areas shall require similar protection from vehicles and pedestrians.

## **C7 Earth Shaping and Planting Regime**

- C7.1 Individual plots shall include earth shaping elements particularly at their perimeter in order to accommodate drainage wetland areas if required as part of the drainage system and sculptural landform and mounding to enhance enclosure and provide additional interest. To enable safe access for planting / maintenance, slopes shall not exceed a gradient of 1:2 where planted with ornamental shrub species and 1:3 in all other locations.

- C7.2 On plot water bodies shall generally be located away from key pedestrian routes. Water bodies shall contain a combination of planting treatments including blocks of trees and shrub planting, wildflower grassland and marginal aquatic species.
- C7.3 The composition of the wildflower seed mix shall include species that are able to thrive in drier conditions at the upper margins of wetlands and damp tolerant varieties capable of establishing on the lower slopes.
- C7.4 Species selection for marginal plants shall be robust and able to cope with changes in water level. Over time there shall be a subtle adaptation in the planting scheme in response to fluctuations in water level and management techniques.
- C7.5 Where stepped access is provided to water bodies, slopes shall not exceed a maximum gradient of 1:3 to allow for emergency egress from the water. Elsewhere, water bodies shall be designed to accommodate areas where the maximum gradient does not exceed a slope of 1:5.
- C7.6 The soft landscaping scheme for plots shall comply with the detailed soft landscaping specification set out at Appendix 1.

### **Safety**

- C7.7 Landscaping shall be utilised as a safety barrier to discourage public access to the ponds. Timber knee rails shall be installed as a guide to pedestrians where planting is not otherwise present.

## **D External Areas**

### **D1 External Storage**

- D1.1 External storage shall not be provided within infrastructure corridors or building service yards fronting the primary site access road except where facilities are single sided and the external storage area is situated behind a 10m wide landscaped zone.
- D1.2 External storage shall have a maximum plot coverage of 2% or 2,000sq.m whichever is the lesser and shall not exceed 6m in height and shall be within fenced areas not exceeding 3m in height.

### **D2 Ancillary Infrastructure**

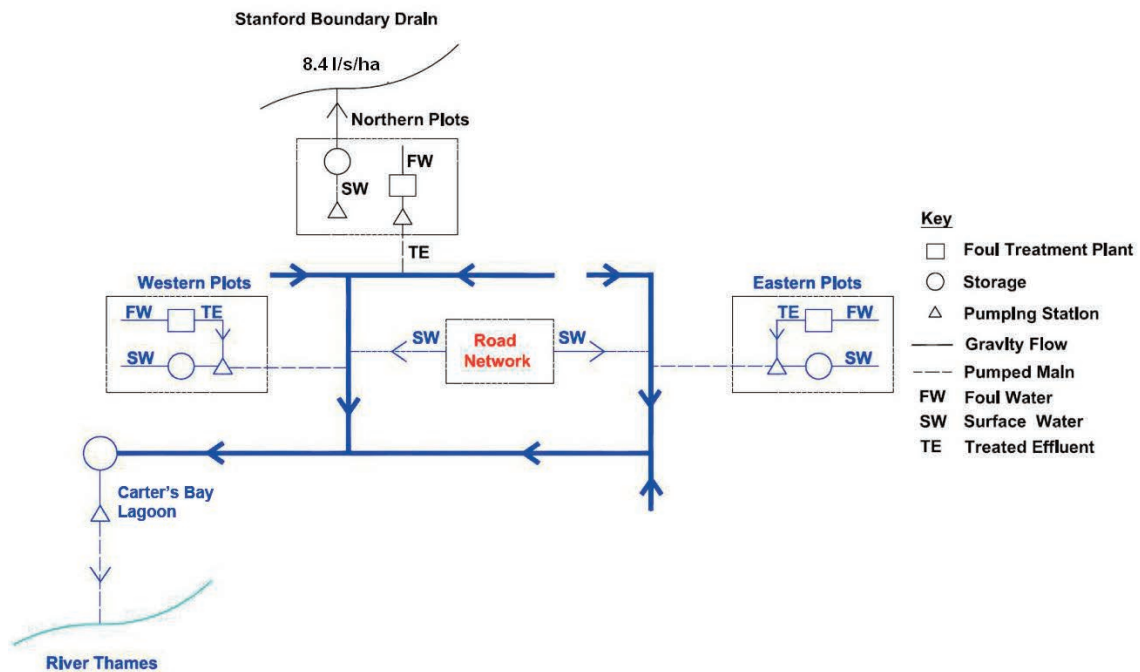
- D2.1 Ancillary infrastructure including permanent plant and equipment necessary to support B1, B2 or B8 uses shall be located in service yards. Such plant and equipment may include (but need not be limited to) external:
- chiller plants;
  - sprinkler tanks and pumphouses;
  - pneumatics;
  - aerosol stores;
  - compressor housing;
  - generators;
  - generator switchgear enclosures;
  - electricity sub stations;
  - refuse areas; and
  - air conditioning units.
- D2.2 Electricity sub stations may also be located on the plot boundary provided they are appropriately landscaped.
- D2.3 The height of ancillary infrastructure shall not exceed the eaves of the associated building.

## E On-Plot Drainage Standards

### E0 Overview

E0.1 An overview of the drainage strategy is depicted in the schematic shown in Figure 14.

Figure 14: Foul and surface water drainage schematic



### E1 Foul Water Drainage and Treatment

- E1.1 Foul water shall be treated on-plot and discharged to the Park swale system or on-plot to a soakaway. All treatment plant installations will require an Environmental Permit under the prevailing Environmental Permitting Regulations.
- E1.2 To avoid the installation of a broad range of different types of treatment plants with different operation and maintenance requirements, a modular submerged aerated filter (SAF) package treatment plant from Conder or equivalent shall be procured and installed in each plot unless other treatment technologies prove to be more effective for the plot application.
- E1.3 Smaller plots may share a treatment plant. Operation and maintenance shall be in accordance with supplier's instructions and the British Water Maintenance and Service Code of Practice.
- E1.4 The size of the on-plot treatment plant will vary depending on the hydraulic and biological load. For preliminary design purposes it can be assumed that an area of approximately 20m x 10m will be required for the plant and associated control



panel. For tertiary treatment, a minimum area of 1sq.m / person shall be provided unless otherwise agreed with the Environment Agency.

- E1.5 The plants shall be sized based on the maximum number of people anticipated to be working within the plot. The flows and loads shall be calculated according to the methodology laid out in the latest edition of British Water's 'Code of Practice – Flows & Loads – Sizing Criteria, Treatment Capacity for Small Wastewater Treatment Systems'. Where a canteen is to be provided, the appropriate loads shall be used in the design. A grease treatment or removal (trap or bacterial dosing system) shall be provided to prevent grease reaching the plants.
- E1.6 The plants shall include primary settlement, biological treatment and humus tanks, and ancillary equipment such as blowers and pipework as required for the operation of the plants. Duty/standby blowers shall be provided.
- E1.7 The treatment plants shall be provided with an alarm system linked to LGSL's control centre either via a GSM model or telephone line. An alarm will be generated if the air pressure in the air supply is low, the blowers have failed or the power supply to the plant has failed. It will also indicate pump or power failure and high water level in the sump.
- E1.8 Desludging shall be carried out periodically (typically every 60-90 days) as instructed by the supplier in accordance with the 'Code of Practice – Guide to Desludging of Sewage Treatment Systems'.
- E1.9 The reed bed downstream of the sampling chamber shall be designed and constructed in accordance with Building Regulations and planted with phragmites australis or similar.
- E1.10 Occupiers will be the Environmental Permit holder and shall be responsible for the design, construction and maintenance of the treatment plant. London Gateway Services Limited (LGSL) will act as the management company to manage the Park and will have the right to monitor plant performance at any time and will have emergency access rights to undertake remedial action should it be necessary. It shall manage the swales, including routine water quality monitoring and shall respond to environmental incidents.
- E1.11 Monitoring shall be undertaken on a quarterly basis or other time period as agreed with the Environmental Advisory Group (EAG). The monitoring results shall be made available to the EAG on request.
- E1.12 The following measures shall be complied with during the design and installation of the foul drainage treatment and pumping installations:
- i. Equipment control panels shall be located in readily accessible locations with very low flood risk potential.
  - ii. Telemetry shall be provided for monitoring by LGSL to ensure rapid response to any potential major pollution risk to the primary surface water drainage system.

- iii. Vehicular access shall be provided to meet the operation and maintenance requirements of the selected treatment and pumping facilities.
  - iv. Provision shall be made for emergency over pumping facilities in the case of pump failure and emergency generator facilities in the case of power failure.
  - v. Wet well venting shall be implemented in accordance with the Dangerous Substances and Explosive Atmosphere Regulations (DSEAR). These regulations will identify potentially hazardous zones that will in turn impact on the location of pumping stations and vent columns in proximity to buildings.
  - vi. A sampling chamber, the design of which shall be agreed with the Environment Agency, shall be provided downstream of each treatment plant and any tertiary treatment that is provided to allow sampling and flow measurement of the final effluent.
  - vii. The risk of pollution from mechanical/electrical/process failure shall be evaluated to inform the choice of installation design solutions.
  - viii. The plants shall be completely enclosed by a fence sufficient to prevent unauthorised access.
- E1.13 Analysis has shown that where dilution of treated effluent with base flows in the swale system to a ratio of 8:1 can be achieved, the treated effluent quality discharged into the swales should be at least SS 30 mg/l; BOD 20 mg/l and NH<sub>3</sub>-N 20mg/l.
- E1.14 The EA will set effluent quality conditions as part of the Environmental Permit for each installation. As a dilution ratio of 8:1 cannot be guaranteed such as during dry spells and in sections of watercourse close to the head of the swales, the effluent quality required for each treatment plant will be decided on a case by case basis and the level of treatment necessary determined accordingly.
- E1.15 A sampling chamber agreed with the Environment Agency, shall be installed downstream of the treatment process to allow sampling and testing of the final effluent prior to discharge to the watercourse. The sampling point shall be identified by signage.
- E1.16 The treated effluent may be drained to an on-plot lagoon containing reeds, which could form part of the treatment process. The final effluent compliance monitoring point shall be located after all the treatment processes. Some treated effluent may soak away through the base of the lagoon. This may require a permit from the Environment Agency under the Groundwater Regulations 2010. Based on the results of a percolation test, the unlined on-plot lagoon could have an appropriate area to allow some of the effluent from the treatment plant to drain away into the ground. However, this percolation should not be relied upon as part of the means of effluent disposal.

- E1.17 Where possible, flow to the lagoon shall be by gravity. Wherever pumping is required a pumping arrangement with duty/standby submersible pumps shall be installed.
- E1.18 The foul water drainage networks for the plots shall be designed in line with Building Regulations Approved Document H, BS EN 752, Civil Engineering Specification for the Water Industry (CESWI) 7th Edition and Sewers for Adoption 7th Edition as applicable to pass flows based on the proposed occupancy of the site and the likely water demand.
- E1.19 Pollution Prevention Guidelines “Treatment and Disposal of Foul Sewage where no Foul Sewer is Available” (PPG4), or the latest equivalent guidance, shall be used as a guide for the treatment and disposal of sewage.

## **E2 Surface Water Drainage**

- E2.1 The surface water drainage for the plots shall be designed in line with Building Regulations Approved Document H, BS EN752, Sewers for Adoption 7th Edition and best practice guidance to pass the 1 in 2 year flow without surcharge in the system.
- E2.2 Sustainable methods of surface water collection, conveyance, disposal and attenuation shall be preferred over traditional methods and shall be implemented on each plot wherever practicable to CIRIA 697 (or latest equivalent guidance) to withstand flooding up to the 1 in 30 year return period.
- E2.3 Flooding for flows up to 1 in 100 year return period + 20% allowance for climate change may be contained within low-risk areas such as car parks and landscaped areas within the plot boundary or from Southern Zone plots as shown on Figure 15, and may be pumped to the Logistic Park swale.
- E2.4 Surface water runoff from the plots in the Southern Zone shall be discharged to the Park swale either by gravity at an unlimited rate or pumped at a maximum rate of 90 litres per second per hectare.
- E2.5 Surface water runoff from the Northern Zone plots (as shown on Figure 15) shall be pumped into on-plot balancing storage facilities which will then outfall at a controlled discharge rate into the adjacent Stanford Boundary Drain (SBD).
- E2.6 The allowable discharge to SBD shall be limited to the equivalent Greenfield runoff rate as calculated in accordance the Institute of Hydrology Report No. 124, i.e. QBAR = 2.6l/s/ha; 1 in 30 year return period = 6.0l/s/ha; 1 in 100 year return period = 8.4l/s/ha.
- E2.7 Occupiers shall undertake their own risk assessment of their plot, given the nature of their business, and provide back-up pumps and power if necessary.

Figure 15: Drainage catchment zones

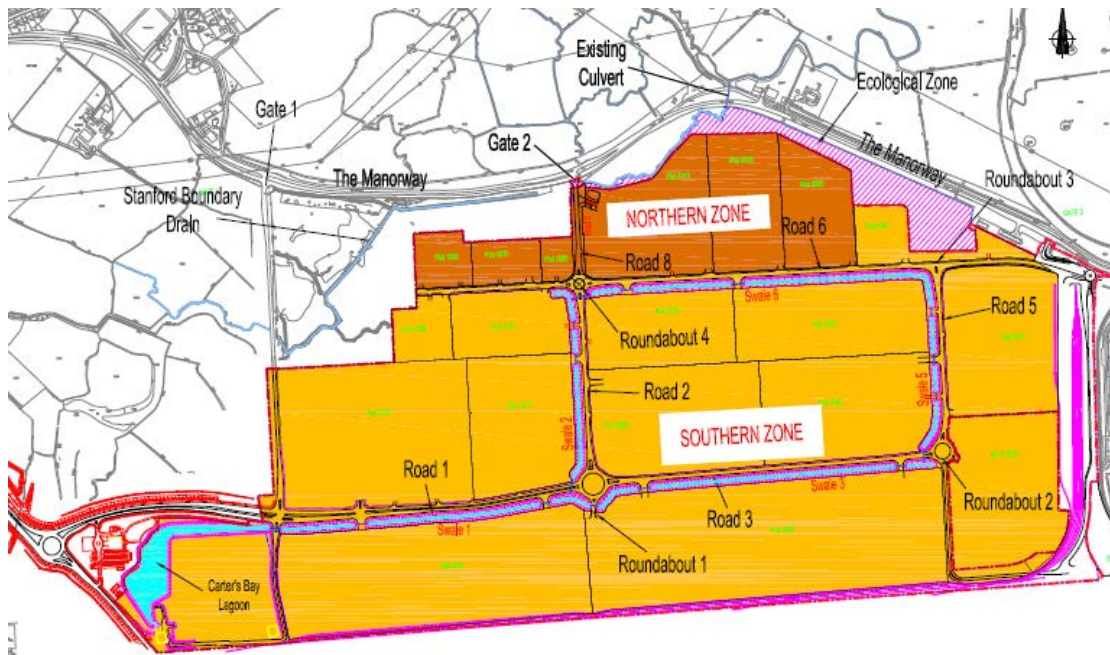


Table 7: Summary of Design Parameters

Item	Parameter	Nominal
Allowable Discharge	To Northern Plots to Stanford Boundary Drain	8.4 l/s/ha
	From Southern Plots to the Swale – by gravity	Unlimited
	From Southern Plots to the Swale – by pumping	90 l/s/ha
Design Standard	On-Plot drainage system	1 in 30 year without flooding  1 in 100 year + 20% Climate Change with flooding routed to safe areas such as car parks or pumped to the swale (Southern Plots only)
	Final effluent consent	To be determined through environmental permit.

### E3 Pollution Control

E3.1 A Pollution Prevention Plan shall be prepared for each plot by the occupier. It shall have regard to the processes and risks associated with the proposed business activities and this shall be made available for inspection at any time. Equipment



to contain spillages, including oil booms but also drain blockers and dams to contain soluble pollutants shall be made readily available.

- E3.2 The swales alongside plot access roads throughout the site shall be inspected, at least on a weekly basis, for signs of pollution, such as oil on the water surface. A programme of monitoring the water quality in the swales and the treatment plan discharges thereto shall be agreed with the Environment Agency prior to occupation of the plots. Where pollution is evident, as with visible oil, appropriate clean-up measures, such as absorbent booms shall be used to remove it. Oil booms shall be removed on completion of the clean-up to avoid re-release of oil or potential blockages.
- E3.3 The drainage system from each plot shall require oil separators, grease traps and other containment at source, as necessary for the nature of each business.
- E3.4 Any oil, fuel or chemical storage tanks, buildings, ancillary handling facilities, filling, drawing and overflow pipes shall be enclosed within an impervious bunded area of at least 110% of the tank capacity and the bunded area shall be fully constructed in accordance with current Oil Storage Regulations before the relevant part of the development to which it first relates is first occupied or brought into use.
- E3.5 Parking areas in excess of 50 spaces, and areas accessed by commercial vehicles or HGV's, shall be drained to the drainage network via an on-site oil separator designed in accordance with Pollution Prevention Guidelines 'Use and Design of Oil Separators' (PPG3). Silt shall be managed at source.
- E3.6 In the event of a major pollution incident occurring on-plot, the system shall be isolated or discharge to the swale shall be shut down until the pollution incident has been cleaned up.
- E3.7 Plot drainage shall be separated from the main surface water drainage system at the following locations to allow for the containment of pollutants:
- Loading areas where spillage of cargo may occur;
  - Skip/waste storage areas;
  - Areas where chemicals and oils are stored;
  - Boiler/chiller areas where condensates are discharged.
- E3.8 On-plot vehicle fuelling point or lorry/car washing facilities shall be isolated and any surface water runoff shall be discharged to the foul drainage system, provided the foul drainage system is designed to treat this, before discharging into the swale. Alternatively, this run-off shall be treated as trade effluent, and shall be isolated and taken off site for disposal at a licensed facility.
- E3.9 Any effluent other than of a domestic nature shall be isolated, taken off site for disposal or treated separately as appropriate.
- E3.10 Surface water runoff from waste storage areas and any other high risk areas shall be treated appropriately and discharged in accordance with relevant Building Regulations, PPG and SUDS guidance.



# Part 2: Infrastructure Standards



## PART 2: Infrastructure Standards

### F Highway Design Standards

F1.0 The following highway design standards shall apply to the construction of internal site access roads, footways and cycleways. Road infrastructure connections for each phase of development shall be provided to wearing course prior to operational use of any building.

#### F1 Internal Access Roads

F1.1 The general layout and hierarchy of the internal access roads is shown on Figure 16.

F1.2 The primary and secondary infrastructure corridors shall be constructed to accommodate the road carriageway, service corridors, verges (including a shared use cycleway and footway) and landscaped drainage channel (swales) in step with the phased development of the site.

F1.3 Dual carriageways and single carriageway roads shall be constructed to the dimensional standards identified on the cross sectional drawings set out at Figures 17 and 18.

F1.4 All roads shall be constructed in accordance with requirements set out in the Design Manual for Roads and Bridges (DMRB).

F1.5 Security fences or gates shall not obscure sight lines of any junction on the public highway or any vehicular access to the highway.

#### F2 Road Drainage

F2.1 The carriageways in the Park shall be provided with infiltration drains to intercept surface water runoff and allow it to soak into the fill and filter drains to intercept the silt and minimise the requirement for periodic de-silting of the channel.

F2.2 The roundabouts shall be provided with a surface water drainage system comprising a combined drainage and kerb system as defined in HA39 of the DMRB. These shall be connected to the swale drainage system via deep trap gullies and a watertight carrier drain or gully tail.

#### F3 Pollution Control

F3.1 Equipment to contain spillages including oil booms, drain blockers and dams to contain soluble pollutants, shall be made readily available by London Gateway Park Development Limited (LGPDL).

F3.2 Spillage containment facilities shall be provided at roundabouts and major junctions where an increased risk of vehicle collision/overturning exists. Slots for stop logs at the upstream end of the culverts shall be included within the design of the culverts.



Figure 16: Layout and hierarchy of internal access roads

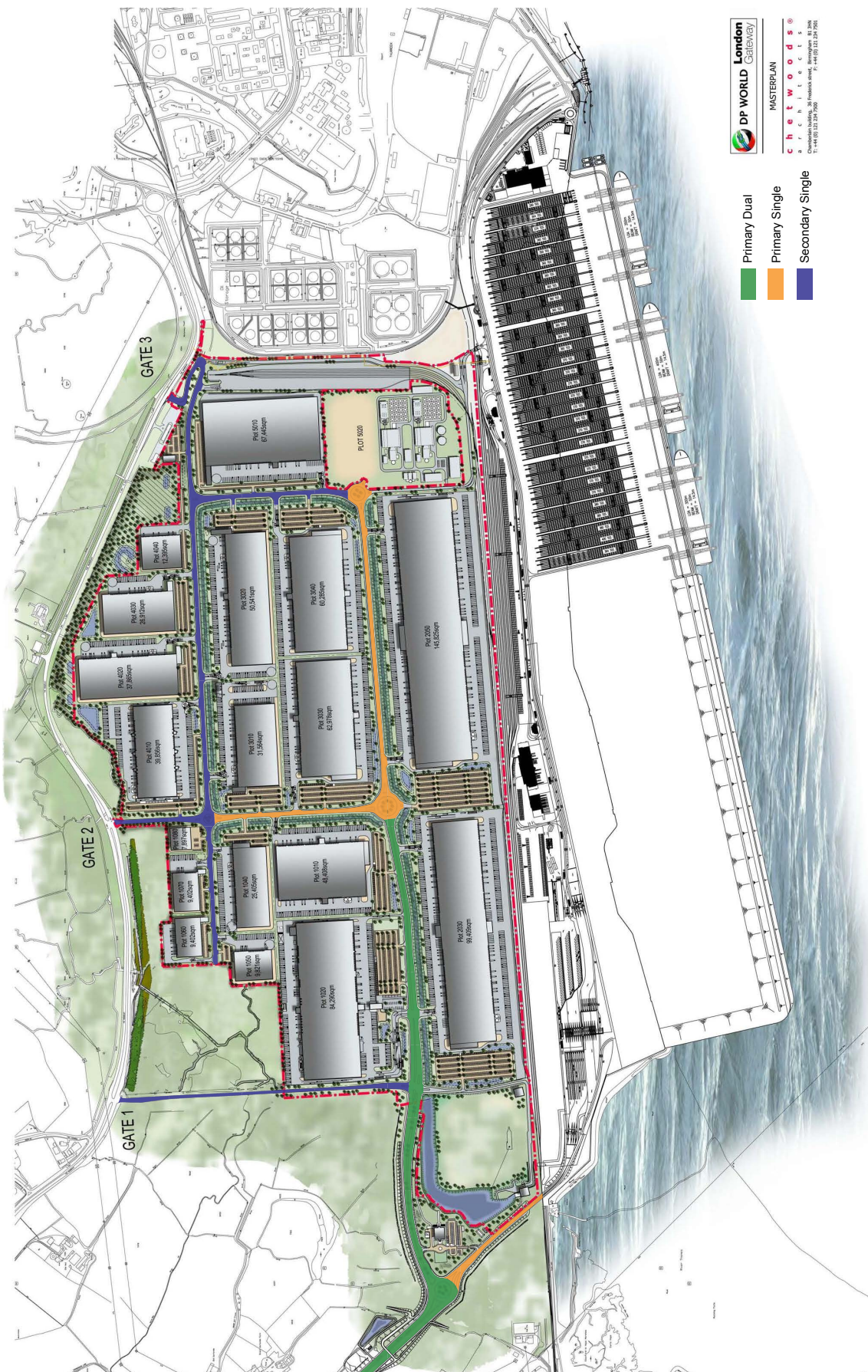
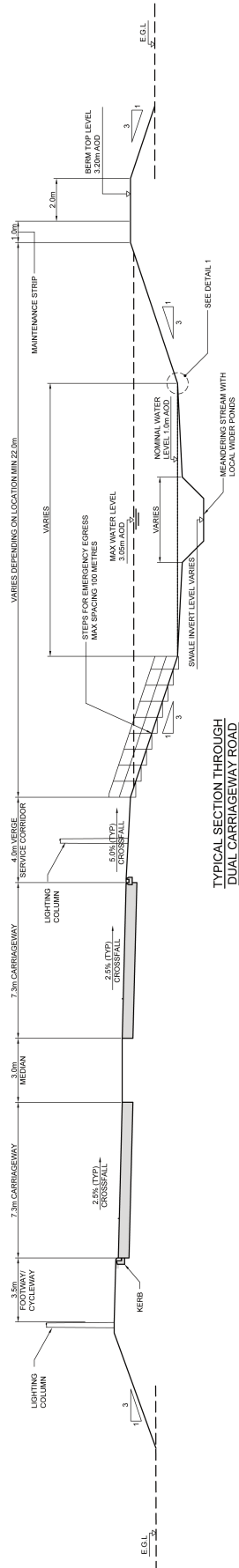
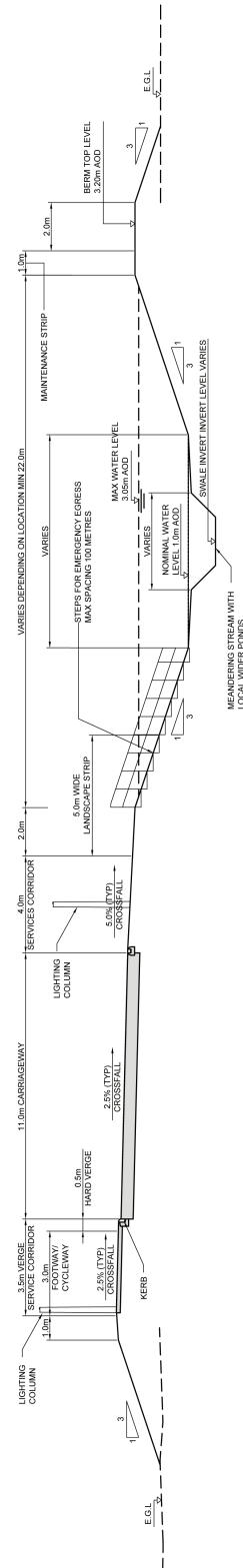


Figure 17: Dual carriageway cross section



TYPICAL SECTION THROUGH DUAL CARRIAGEWAY ROAD

Figure 18: Single carriageway cross section



TYPICAL SECTION THROUGH SINGLE CARRIAGEWAY ROAD

## F4 Materials

- F4.1 Materials for road construction shall be compliant with the appropriate British Standard or other relevant specification.
- F4.2 Primary and secondary roads, roundabouts and development plot entrances shall be predominantly asphalt.
- F4.3 Standard profile concrete kerbs shall be used adjacent to footpaths / cycleways. High profile concrete kerbs shall be used at HGV entrances and HGV accessible locations.
- F4.4 Road marking shall be in white or yellow thermoplastic paint and kerbs shall be used to provide protection to pedestrian areas.
- F4.5 When available, suitably recycled, locally sourced or 'green energy' materials shall be used where these conform to the necessary standards and will meet the necessary performance standards or specification.

### Standards for Footpaths and Cycleways

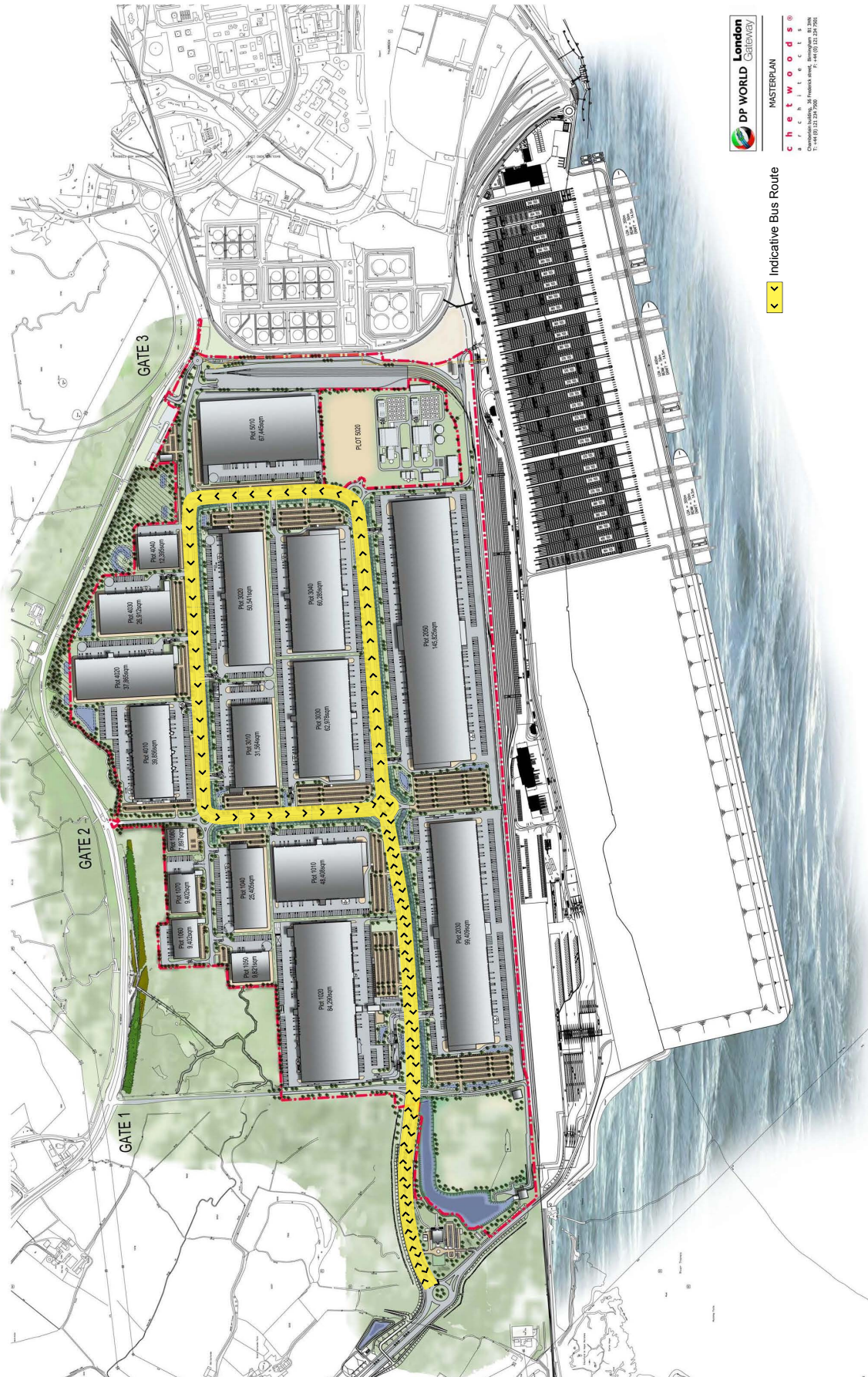
- F4.6 Footways/cycleways shall be a minimum of 3m width.
- F4.7 Where footways/cycleways are liable to vehicle over-run, materials shall be restricted to:
- Bituminous materials to DMRB standards unless there is a need to match existing paths surfaced with Hot Rolled Asphalt (HRA).
  - Resin bound material - Highways Authorities Product Approval Scheme (HAPAS) certified with a minimum design life of 25 years.
  - Where appropriate, concrete block paving, including tumbled blocks, 100mm x 200mm x 80mm.
- F4.8 Where the footway will not be over run or otherwise damaged by vehicles the following paving may be used in addition to that noted above.
- 400mm x 400mm x 65mm standard concrete paving slabs
  - 400mm x 400mm x 65mm textured concrete paving slabs.

## F5 Bus routes and facilities

- F5.1 An indicative bus route through the logistics park is shown on Figure 19. Raised level bus stop kerbs shall be incorporated along the bus route to create a level entry platform.
- F5.2 A bus stop flag with timetable case shall be provided at all bus stops. Where appropriate the flag shall be attached to other street furniture to minimise clutter, otherwise it shall be fitted to a proprietary bus stop pole. Bus stop pole, flags and timetable cases shall be from the current range set out in the Essex County Council Street Materials Guide or any such subsequent guidance as may be produced by Thurrock Council.



Figure 19: Indicative bus route



- F5.3 Where provided, bus shelters shall be metal framed in black to RAL 9005, with a low barrelled or vaulted roof. Shelters shall be fitted with end panels to provide protection from the weather with a clear view panel on the bus approach side. Shelters shall be in accordance with the Accessible Bus Stop Design Guide (Bus Priority Team technical advice note BP1/06 January 2006) prepared by Transport for London (TFL) or the latest equivalent guidance.
- F5.4 Bus shelters shall be fitted with bench seating with armrests, although perch seating may be installed if space is limited. All bus shelters shall be fitted with plates showing the bus stop name on the kerb face and at both ends and shall have an information board installed.

## F6 Soft landscaping

### Infrastructure Corridors

- F6.1 Landscaping aligning the infrastructure roads shall include a range of planting treatments created in linear sections not exceeding 80m in length.
- F6.2 The central reservation of infrastructure roads shall be planted, alternating between single species formal hedgerows and groundcover shrubs. Hedgerow / shrub planting sections shall not exceed 40m in length.
- F6.3 Landscaping aligning the secondary infrastructure roads shall be predominantly native and smaller in scale than that proposed on primary infrastructure roads.
- F6.4 A native hedgerow shall be planted where 10m planted buffer strips on plots abut infrastructure areas to establish a dense edge and deter access.
- F6.5 Service corridors aligning infrastructure roads shall be grass seeded or turfed.
- F6.6 The planting schemes shall take into consideration the required visibility for road users.

### Roundabouts and Plot Entrances

- F6.7 Specimen trees, ornamental shrub planting and formal hedgerows shall be permitted at key nodes to provide interest.
- F6.8 To assist users in wayfinding around the site, species at the approach to roundabouts shall be selected for their foliage or stem colour and shall be consistent with that used at the nearest roundabout to the plot. This colour shall be applicable as a theme for that roundabout and applied to any architectural or artistic features contained within it.

## F7 Lighting Requirements

### General Considerations

- F7.1 The general standards set out for Plots at paragraphs B8.38 – B8.40 shall apply to all exterior lighting across the site. References to lighting equipment are indicative and may be amended subject to achieving the stated performance requirements.



- F7.2 Lighting equipment when installed, shall meet the lighting constraints defined in ILP Guidance Notes GN01 for the control of obtrusive light for the Environmental Zone applicable to the location of the site (see Figure 6). Additional care shall be taken to minimise light spill and glare from any lighting installed by ensuring the correct luminaire is selected and installed in line with the recommendations within CIE 150 (2003) and ILP GN01. The design shall ensure the mounting heights employed are the minimum necessary to achieve the lighting performance requirements. Illuminance levels shall not exceed 1.0 lux at 25m from the Site boundary and 0.1 lux at 50m from the Site boundary.
- F7.3 Lighting columns shall have foundations suited to the ground conditions to maintain lifetime stability and safety and may need to be piled.

### Lighting Classes

- F7.4 The lighting classes for roads footways and cycleways would be as set out in BS 5489-1: 2013 Code of practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas or as subsequently modified and BS EN 13201:2003 Road Lighting. The lighting classes for outdoor work areas would be as set out in BS EN 12464-2:2007 Light and Lighting – Lighting of workplaces; Part 2: Outdoor work places.

### Primary and Secondary Roads

#### *Performance Requirements*

- F7.5 The lighting of the primary and secondary roads shall be designed to lighting class ME3b of BS5489-1:2013. The performance requirements are:

Average luminance, Lav:	1.0cd/m <sup>2</sup>
Overall Uniformity, Uo:	0.40 minimum
Longitudinal Uniformity, Ul:	0.60 minimum
Threshold Increment, TI:	15% maximum

- F7.6 At roundabouts and junctions luminance performance criteria shall not apply and these should be treated as Conflict Areas where CE class illuminance criteria shall apply.

- F7.7 At junctions with primary or secondary roads, the lighting shall meet class CE2 of BS 5489-1 as follows:

Average illuminance, Eav:	20 lux
Overall Uniformity, Uo:	0.40 minimum

#### *Equipment details*

Luminaire and lamp:	Urbis Furyo 2 lantern or equivalent with 140W CPO-TW
Lighting column and bracket:	Urbis FLO column and bracket or equivalent of 10m maximum height
Mounting attitude:	Zero inclination

*Installation Geometry*

- F7.8 Dual Carriageway: Lighting columns shall be mounted in an opposite arrangement at the rear of the services corridor or boundary of the services corridor and cycleway/footway at a nominal longitudinal spacing of 38m.
- F7.9 Single Carriageway: Lighting columns shall be mounted in a single sided arrangement at the rear of the cycleway/footway at a nominal longitudinal spacing of 36m.

**Lighting for Formal Footways and Cycleways**

- F7.10 Where there is a footway or cycleway alongside the carriageway, the Surround Ratio of the luminaires installed for the carriageway lighting shall provide sufficient lighting of the footway and cycleway without the need for supplementary lighting.
- F7.11 Where footways are remote from other lit areas dedicated lighting shall be provided to lighting class S4 of BS 5489-1.

*Performance Requirements*

- F7.12 The performance requirement for lighting class S4 is:

Average illuminance, Eav:	5 to 7.5 lux
Minimum illuminance, Emin:	1.0 lux

- F7.13 This level can be further reduced dependent upon the Ra and the S/P ratio of the lamp in accordance with Clause A 3.3.3 of BS5489-1:2013.

*Equipment Details*

Luminaire and lamp:	Urbis Furyo 1 lantern or equivalent with 45W CPO-TW
Lighting column and bracket:	Raising and lowering column and 0.5m bracket of 5m maximum height.
Mounting attitude:	Zero inclination

*Installation Geometry*

- F7.14 Single Carriageway: Lighting columns shall be mounted in a single sided arrangement at the rear of the cycleway/footway at a nominal longitudinal spacing of 30m.

**Lighting for Bus Stops**

- F7.15 Lighting columns shall be positioned so as not to obstruct bus doors and shall be located outside the boarding/alighting zone. An enhanced level of street lighting shall not be necessary at bus stops.
- F7.16 Electrical supply for bus shelter lighting and communications shall not originate from the street lighting supplies.

**F8 Signage**

- F8.1 Estate signage shall accord with Traffic Signs Regulations and General Directions 1981 (or any revisions thereto) to maintain a coordinated appearance to the development.

**F9 Emergency Access**

- F9.1 Gates 1 and 3 shall be utilised to provide an alternative access route for emergency vehicles and buses. These routes shall comprise a minimum of single lane roadways of 3.7m width with locked gates to the perimeter of the site.
- F9.2 Access requirements for fire and rescue vehicles shall comply with Part B, Section 16 of the Building Regulations (Volume 2, 2006 Edition, Amended 2007 and 2010).

## G Park Drainage Standards

### G1 Surface Water Drainage

G1.1 The runoff from the road network shall drain via a network of swales to a balancing pond (Carter's Bay Lagoon) before being pumped to the River Thames.

### G2 Swales

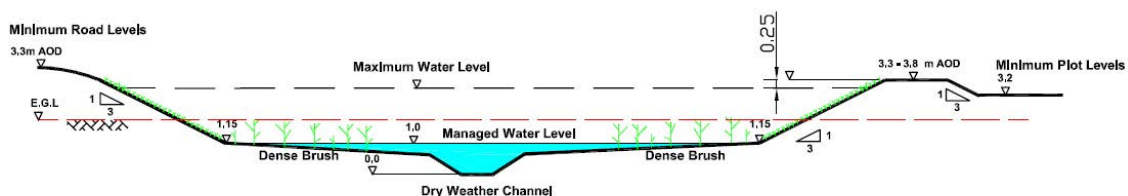
G2.1 A network of swales shall act as the arteries of the drainage system, conveying the flow to the balancing pond. The swales will also act as a balancing and storage system under storm conditions.

G2.2 The swales shall be sized to fit within the corridor allowed in the Masterplan. The overall widths of the swales may vary between 18m to 26m. The invert level of the swales shall be set at 0.6m AOD at the head falling to Ordnance Datum (0.0m AOD) at the outfall to Carter's Bay Lagoon. Culverts shall be used at road crossings and entrances to plots.

G2.3 The depth of water flow in any swale shall be limited to allow a minimum freeboard 0.25m during the 1 in 100 year event + 20% allowance for climate change to provide a margin of safety against flooding.

G2.4 A typical swale cross section is shown in Figure 20 below:

**Figure 20: Swale cross section**



G2.5 The maximum water level at the heads of the swales shall be approximately 3.31m AOD. A minimum clean water flow in the swales shall be ensured at all times to provide the required dilution for the treated sewage effluent discharging from the plots as required by the Environmental Permit. A model describing how this will be achieved shall be agreed with the Environment Agency, in advance.

G2.6 The groundwater table varies across the site. The base of the swales is expected to be permanently submerged within the groundwater table. The groundwater level is expected to be between approximately 1.25m AOD at the head of the system and 1.0m AOD at the receiving lagoon. Adjacent to the permanent water shall be an area of landscaping described as "dense brush".

### Planting Regime in Swales and Ponds

G2.7 The swales shall contain a combination of planting treatments, including meadow and damp tolerant wild flora seeding, marginal / aquatic planting, native shrub

planting and standard tree planting. Variation shall be achieved along their length through the use of differing plant species.

- G2.8 The composition of the wildflower seed mix shall include species that are able to thrive in drier conditions at the upper margins of wetlands and damp tolerant varieties capable of establishing on the lower slopes.
- G2.9 Species selection for marginal plants shall be robust and able to cope with changes in water level. Over time there shall be a subtle adaptation in the planting scheme in response to fluctuations in water level and management techniques.
- G2.10 Hedgerows and shrub planting shall be provided along the swale corridor (see Figure 21) to provide low level screening and to discourage public access to the swales and guide movement. Timber knee rails shall be installed as a guide to pedestrians where planting is not otherwise present.
- G2.11 Drainage swales aligning the infrastructure roads shall include a range of native planting treatments along their length. Whilst narrower than those adjacent to the primary infrastructure roads, drainage swales on secondary roads shall still include a range of planting treatments.
- G2.12 Steps shall be incorporated into drainage swales to allow access for maintenance and safety. Slopes within swales and water bodies shall not exceed a maximum gradient of 1:3.
- G2.13 For safety, where stepped access is not otherwise provided, water bodies shall be designed to accommodate areas where the maximum gradient does not exceed a slope of 1:5.

### **G3 Carter's Bay Lagoon**

- G3.1 The swale network shall drain to a 3.1ha attenuation pond named Carter's Bay Lagoon. This may be constructed in two phases in line with development requirements.
- G3.2 The effective depth above the baseflow level shall be maintained for storm flows by pumping down to the permanent water level in the Carter's Bay Lagoon. Pump controls shall be set to maintain the level in the lagoon / swales to approximately 1.0m AOD during dry weather flow. The invert level of the lagoon shall be set at Ordnance Datum (0.0 m AOD).
- G3.3 The lagoon shall have a side slope of 1 in 3. A safety ledge / berm of approximately 5m width shall be provided around the wet area of the lagoon for maintenance.
- G3.4 The lagoon shall be provided with safety features as detailed in CIRIA Guide C697 or the latest equivalent guidance. As a minimum, stepped egress points and danger warning signs incorporating buoyancy aids shall be provided at appropriate intervals.
- G3.5 Provision shall be made to facilitate the emptying of the lagoon using the pumping station.



G3.6 A typical plan and cross-section of the lagoon is shown on Figure 22.

G3.7 Summary of Carter's Bay Lagoon detail is as follows:

Surface Area:	3.1 ha
Bank Level:	3.2 m AOD
Invert Level:	0 to -0.3m AOD (Inlet to Outlet)
Permanent Water Level	1.0m AOD
Berm width above permanent water:	5m

### **Planting and Ecological Requirements**

G3.8 Carter's Bay Lagoon shall contain a combination of planting treatments including blocks of trees and shrub planting, wildflora grassland and marginal aquatic species (see Figure 23).

G3.9 To provide safe high-tide roosting habitat for Ringed Plover, anchored floating shingle rafts shall be provided within the lagoon. The total site area of the shingle rafts shall be 500sq.m, with a minimum sized raft of 100sq.m, a minimum shingle substrate depth of 100mm and 150mm high perimeter lip.

G3.10 The profile of the lagoon shall be terraced to enable public access and for maintenance. Slopes shall not exceed a maximum gradient of 1: 3 but shall be appropriate to aid establishment of planting.

G3.11 Shallow shelves shall be incorporated into the lower margins of wetlands, to aid establishment of marginal and aquatic species. Species selection for marginal plants shall be robust and able to cope with changes in water level.

G3.12 The composition of the wildflower seed mix shall include species that are able to thrive in drier conditions at the upper margins and damp tolerant varieties capable of establishing on the lower slopes.

G3.13 Planting surrounding Carter's Lagoon shall assist in screening views towards the pumping station from the surrounding area and in providing an attractive setting for those employed within the area to walk around.

G3.14 The raised embankment shall be tied back into the adjacent land at a gradient not exceeding 1:3 and be seeded with wildflowers.

## **G4 The Pumping Station and Outfall Arrangement**

G4.1 The pumping station at the southern end of the Carter's Bay Lagoon shall lift the surface water runoff from Carter's Bay Lagoon to the Thames.

G4.2 A pumping rate to the Thames of no more than 2m<sup>3</sup>/s will ensure the water level in the swales does not exceed the maximum permitted and will reduce the water level in the balancing lagoon in good time to provide capacity for subsequent storms.

G4.3 Construction of the pumping station shall be phased to meet the drainage requirement of the Park. As the site is developed additional pumps and associated equipment shall be installed.

Figure 21: The Drainage Swales, Wetlands and Edge Landscape

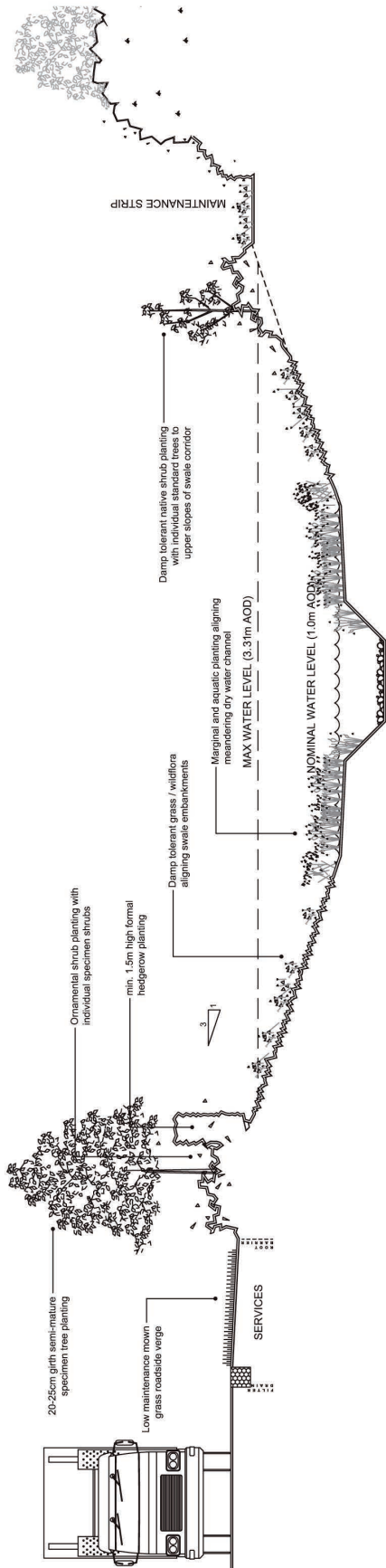


Figure 23: Carter's Bay Lagoon Planting Treatment

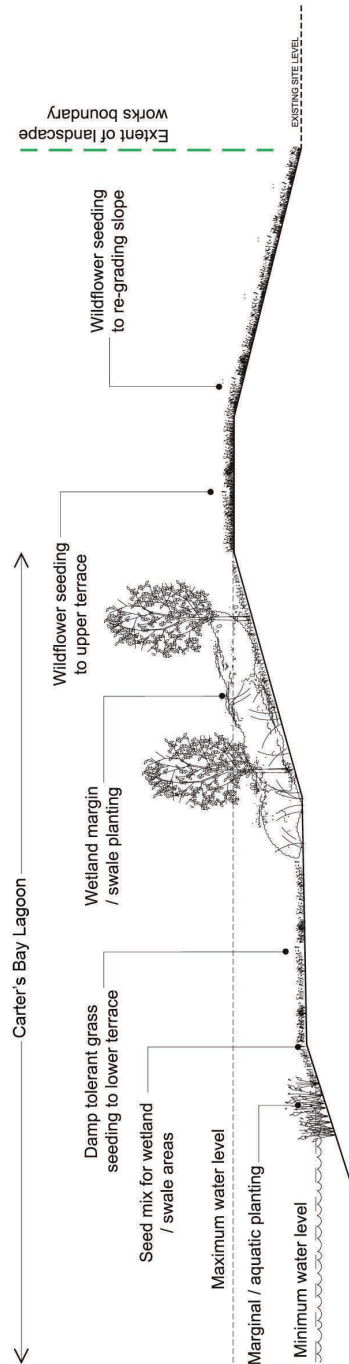
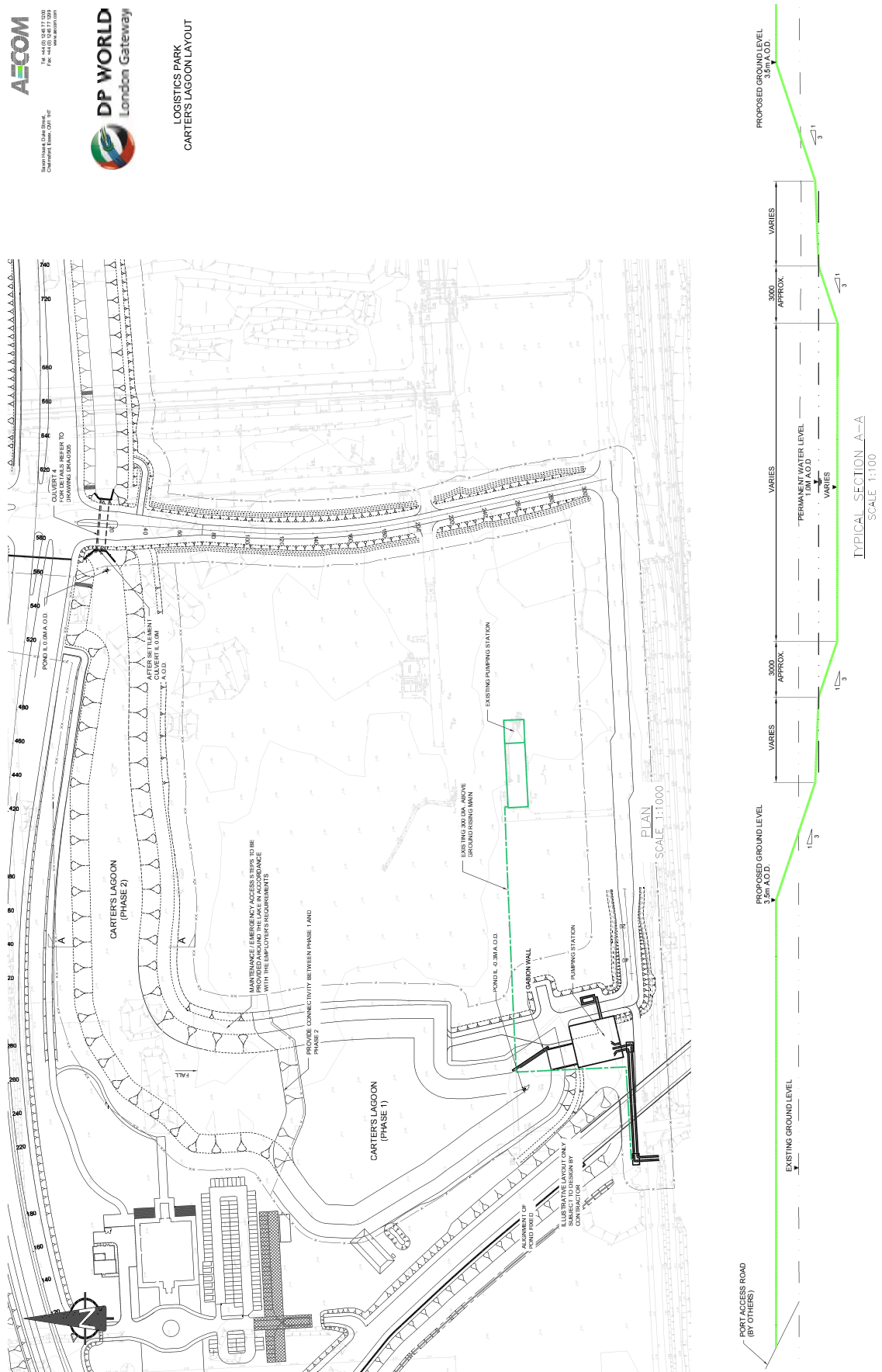


Figure 22: Typical plan and cross-section of Carter's Bay Lagoon



- G4.4 The two outfall pipes shall be extended up to the new pumping station and be used as rising mains to allow the discharge of surface water from the lagoon to the Thames. The rising mains shall be approximately 130m long.
- G4.5 A minimum pumping rate to the tidal estuary to be defined in the model agreed with the Environment Agency (see paragraph G2.5) shall be maintained sufficient to maintain a low flow within the swale system without excessive drawdown of groundwater local to the swales.
- G4.6 One of the existing outfall pipes may be used for gravity drainage to allow the draining of the lagoon by gravity down to 1.0m AOD when the water level in the lagoon is above the tide level.
- G4.7 LGPDL shall monitor the outfall for signs of scour. In the event that scour is occurring appropriate action shall be taken to minimise its effect. This may include the construction of concrete or stone blocks/teeth onto the outfall apron.

### **Standby Generator**

- G4.8 Two additional standby pumps shall be provided in the pump station.
- G4.9 A standby generator shall be installed adjacent to the pumping station. The standby generator shall be required when approximately 70% of the site is occupied.

## **G5 Pollution Control**

- G5.1 Equipment to contain spillages, including oil booms but also drain blockers and dams to contain soluble pollutants shall be made readily available by LGPDL. A “long-stop” containment facility shall be provided at Carter’s Bay Lagoon.
- G5.2 Slots for stop logs at the upstream end of the culverts carrying the swales beneath Park roads and plot accesses shall be included within the design of culverts.
- G5.3 The swale / attenuation pond drainage systems may be provided with planting and reed beds that promote treatment, where feasible to do so, without compromising their primary purpose of conveying water to the pumping stations.

## **G6 Operation and Maintenance**

- G6.1 Trash screens shall only be required at the inlet channels to the pumping station. Debris shall be mechanically removed and the bar spacing sized to avoid debris from damaging the pumps. Provision shall be made at the pumping station intake, for example with a scum board, to prevent floating debris and oil from entering the pumping station and being discharged into the estuary.
- G6.2 The swale shall be maintained through a simple regime of occasional grass cutting, annual clearance of more excessive vegetation and major clearance / reshaping every 5 to 10 years.

- G6.3 The pumping station shall include telemetry. Debris screens at the inlet channels shall be periodically cleaned and the pumps, valves and other equipment shall be periodically inspected and maintained as required.

Table 8: Summary of Design Parameters

Item	Parameter	Nominal	Minimum	Maximum
Swale	Width		18m	26m
	Depth		2.8m	3.4m
	Water level		1m AOD	3.31m AOD
	Water depth		1m	3m
	Side slope	1:3		
	Dry weather channel - side slope	1:2		
	Dry weather channel - base width	1m		
	Road crossing culvert effective area		2 sq.m	4 sq.m
Carter's Bay Lagoon	Area	3.1ha		
	Depth		3.1m	3.4m
	Invert Level		0.0m AOD	-0.3m
	Water depth		1.0m	2.6m
	Bank Level	3.2m AOD		
Pumping Station	Discharge to Thames		0	2 cu.m/s
	Static Head (1 in 200 yr)	4.2m		
	Static Head (1 in 1 yr)	2.7m		
Allowable Discharge	From Park to Thames	Unlimited		
Design Standard	Swale	1 in 100 year + 20% Climate Change		



## **H Land Raising**

### **H1 Land Raising**

- H1.1 Earth re-profiling shall raise the site to the levels set out in Section D of the CoCP. The raised site shall be tied into the existing landform along its edge at a gradient not exceeding 1:3.
- H1.2 The fill material for land raising shall meet the requirements of the Environmental Permit (Reference EPRIYP3691 EK/A001).

## I General Landscaping Requirements

### I1 Soft Landscape Specification

- I1.1 Native shrub, woodland planting and areas of mown and wildflower grassland shall predominate unless otherwise described in this Design Code.
- I1.2 Plant species in general will include (but will not necessarily be restricted to) those listed within Appendix 1.

### I2 Strategic Landscaping Framework

#### Edge of Site

- I2.1 Re-graded slopes to plots shall be aligned along their upper edge by standard trees in a native hedgerow. Understorey and woodland planting will also be established on a minimum of 50% of the remaining slope area.

#### Strategic Landscaping North

- I2.2 Strategic landscaping to the north of the site shall be in accordance with the Structural Landscape Plans included at Appendix 3.

#### Strategic Landscaping West

- I2.3 A strategic landscaping scheme shall be provided along the western edge of the Park to reduce disturbance to wintering birds in accordance with the landscape plans shown at Appendix 4. The landscaping shall incorporate a native mix 'Instant Hedge' and a 1.2m high timber screen fencing planted on top of a 1m mound (above adjacent plot levels) to the west of the Gate 1 access road, Understorey and woodland planting shall be established on a minimum 50% on the regraded slope at the Site edge.
- I2.4 A 10m strip of strategic planting shall be provided along the western most plot boundary in accordance with paragraphs C4.4.

### I3 Street Furniture, Boundary Treatments & Feature Elements

- I3.1 Street furniture and boundary features within infrastructure corridors shall be selected to provide visual interest to the scheme and respond to the individual needs of each development phase.
- I3.2 Street furniture (i.e. seating, cycle storage) shall be grouped together and located in close proximity to key building entrances.
- I3.3 Street furniture products shall be applied in families which are complementary to one another.

## Finishes

13.4 All street furniture items shall conform to the following finishes:

- Timber elements: FSC certified hardwood (Iroko, Oak or similar).
- Stainless steel elements: Grade 316 stainless steel (satin polished or brushed finish).
- Galvanised elements: Hot dip galvanised to BS EN ISO 1461.
- Concrete elements: White / light grey smooth finish.
- Powder coated galvanised mild steel elements: RAL 7016 Anthracite Grey.

13.5 All street furniture and boundary treatments shall closely reflect the ranges specified.

### Bollards:

- shall be manufactured in galvanised steel or brushed grade 316 stainless steel.
- shall be tubular with a flat or domed top or square with a flat top.
- may vary in height from 900-1200mm and in section from 76mm to 204mm diameter depending on their intended use.
- may include reflective banding, recessed banding, internal luminaries and other such accessories.
- may be fixed, collapsible, telescopic, retracting or removable depending on their intended use.
- unless required to do otherwise all bollards will be root fixed below ground.



*Manufacturers (or similar)*

*Broxap ([www.broxap.com](http://www.broxap.com))*

*Bailey Streetscene ([www.baileystreetscene.co.uk](http://www.baileystreetscene.co.uk))*

*Woodhouse ([www.woodhouse.co.uk](http://www.woodhouse.co.uk))*

*Heavy Duty Bollard*

*Steel Bollard*

*Geo Bollard*

### Seating:

- shall be composite galvanized steel or brushed grade 316 stainless steel with FSC hardwood timber; or pre-cast smooth finished concrete.
- may include backrests, armrests, centre armrests and anti-skateboard devices.
- shall be root fixed below ground where manufactured in composite steel and timber.
- Concrete seating units will be of sufficient weight to resist movement.



*Manufacturers (or similar)*

*Factory Furniture ([www.factoryfurniture.co.uk](http://www.factoryfurniture.co.uk))*

*Falco ([www.falco.co.uk](http://www.falco.co.uk))*

*Woodhouse ([www.woodhouse.co.uk](http://www.woodhouse.co.uk))*

*Soca Bench*

*FalcoBloc Bench*

*Geo Bench*

**Litter Bins / Cigarette Ash Waste Bins:**

- shall be manufactured in galvanised steel or brushed grade 316 stainless steel and may include areas of FSC hardwood timber.
- shall be root fixed below ground.
- shall have side apertures to minimise rainwater ingress.
- shall be powder coated galvanised steel in RAL 7016 Anthracite Grey
- maintenance access entry points shall be fitted with secure locking devices.



*Manufacturers (or similar)*

*Factory Furniture ([www.factoryfurniture.co.uk](http://www.factoryfurniture.co.uk))*

*Falco ([www.falco.co.uk](http://www.falco.co.uk))*

*Voss ([www.vossstreetfurniture.co.uk](http://www.vossstreetfurniture.co.uk))*

*Large Round Bin*

*FalcoBloc Bin*

*LB10t Litter Bin*

I3.6 Additional street furniture items may be incorporated into the development. Where required, selection shall reflect the character indicated within the street furniture ranges specified.

I3.7 The detailed specification for boundary treatment set out at Part 1 Section C2 of this document shall also apply across all off-plot areas of the site where required.

**Feature Elements**

I3.8 Where appropriate opportunities for public artwork to help orientate and provide interest to users shall be incorporated at key locations across the park.

- I3.9 Lighting of landscaped areas for aesthetic effect may be provided in accordance with the product specification set out at Part 1 Section C3.

#### **I4 Landscape Management Plan**

- I4.1 A coherent, strategic and integrated approach to the management and maintenance of the soft landscape components associated with the development shall be adopted in accordance with the Landscape Management Plan set out at Appendix 2 to ensure the successful establishment of vegetation and overall integration works within the surrounding landscape.



## **J Service Infrastructure**

J1.0 Service infrastructure upgrades to serve the development shall be required.

### **J1 Gas Supply**

J1.1 The existing Mains (high/intermediate/medium pressures) run parallel to the Manorway on the northern edge of the site. The new gas main shall connect to this supply and shall be routed through to Gate 2 where it shall run in parallel with the proposed central access road to individual plot gas governor/governor meters throughout the Park.

### **J2 Potable and Non-Potable Water Supply**

J2.1 Potable water supply shall be drawn from the existing Essex and Suffolk network and shall be routed throughout the Park via Gates 1 and 2.

J2.2 Measures to reduce potable water consumption shall be implemented where practicable following an appropriate feasibility study. Non-potable water shall be used for landscape maintenance wherever possible through the re-use and recycling of rainwater, the import of treated effluent from nearby wastewater treatment facilities or abstraction from shallow groundwater and/or drainage swales on site, taking account of site constraints and license requirements. Abstractions from controlled water including groundwater shall be undertaken only following due process and permitting under the Water Resources Act.

### **J3 Electricity Supply**

J3.1 An 11kV distribution network shall be installed across the site to serve individual plot requirements. Secondary substations shall be installed on individual plots. The 11kV distribution network shall be fed from two 33kV/11kV primary substations, which are fed from the 33kV switching station.

J3.2 A number of new primary sub stations shall be located within the Park.

### **J4 Telecommunications**

J4.1 The new fibre optic and traditional copper lines required shall branch off from the surrounding BT network. In addition a new fibre optic network shall be provided for Virgin Media Telecommunications. These currently run from The Manorway roundabout to Coryton roundabout parallel with the south side of the road and follow existing cabling through Gate 1 and 3 and along the existing access road.

J4.2 A private fibre optic network shall be installed to support communications of various items such as CCTV, WLAN, BMS, ANPR and access control systems. This shall be accommodated in the infrastructure service corridors.

### **J5 Fire fighting systems**

J5.1 Fire hydrants, sprinkler mains and sprinkler storage tanks shall be appropriately sited, as required.

**J6 Utility Infrastructure**

- J6.1 Inspection and access chambers, junction boxes, cabinets and feeder pillars shall be located where they will not affect highway safety, cause unreasonable inconvenience to any user of the road network, or detract from the character of the street.
- J6.2 Utility infrastructure shall usually be accommodated within the main infrastructure corridors (within 2m of ground level) and within road verges or footpaths.
- J6.3 Alternative routes or variations to the corridor dimension shall be considered where appropriate to meet the specific requirements of a development. To ensure that all parties are agreeable to such alternatives or variations, the developer shall obtain the written agreement of each individual service provider and any other party who would be affected.

**J7 Sub-stations, Pumping Houses and Other Non-commercial Buildings.**

- J7.1 Sub-stations, pumping houses and other non-commercial buildings shall be constructed to the material specification set out in Part 1 at Section A4.8.



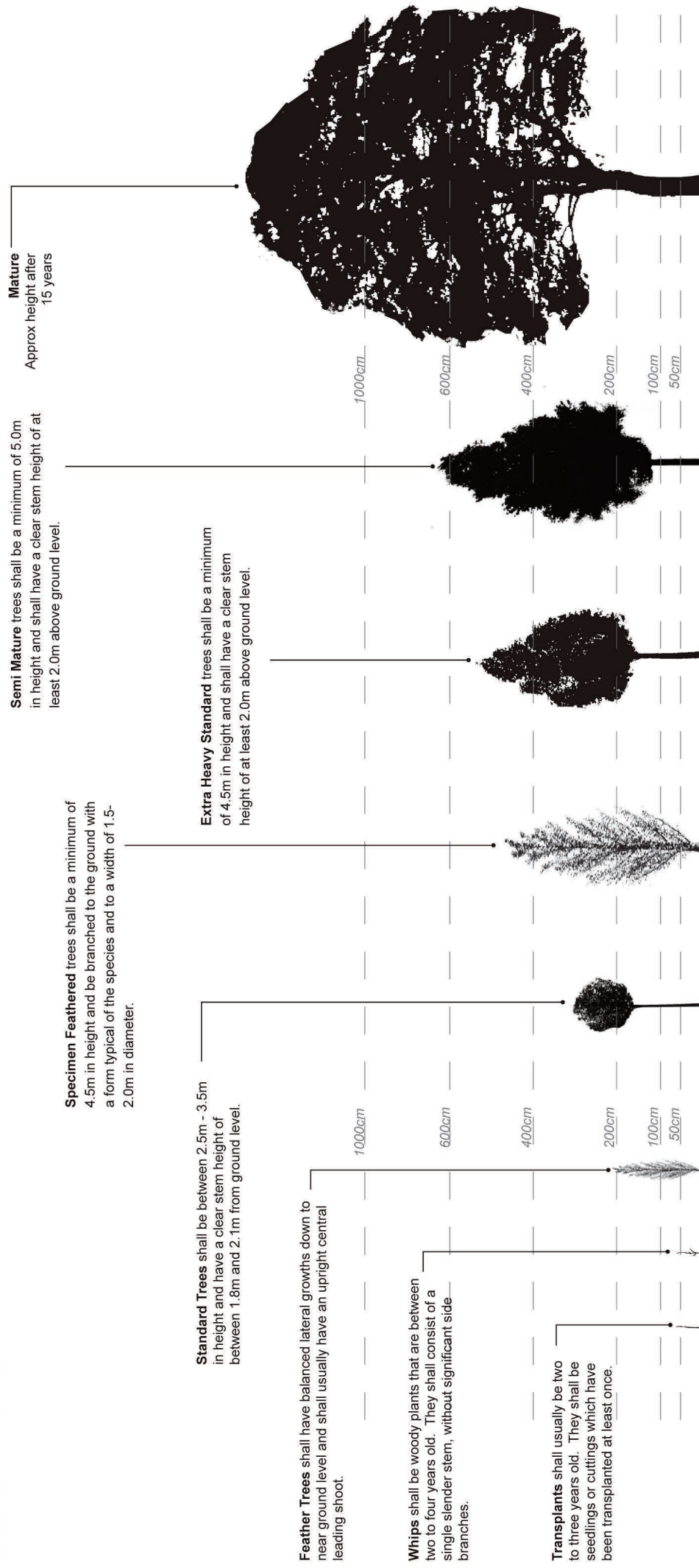
Appendix 1:  
Soft Landscape Palette





Soft landscaping across the site shall be selected to provide interest and vibrancy to the development; to meet the specific site conditions experienced at London Gateway; and to optimise wildlife benefit and potential for habitat creation. Selection shall include (but shall not necessarily be restricted to) the following palette of tree, plant and seed species.

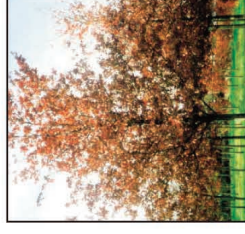
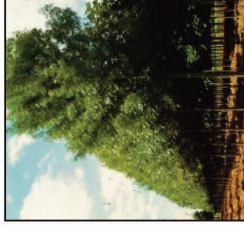
## Illustrative Tree Sizes



## Specimen Trees

Specimen trees shall include Semi Mature, Extra Heavy Standard and Specimen Feathered species in advanced state of growth. Tree species shall be planted within woodland areas to create a high canopy structure and within the park (singularly, in small groups and as linear blocks) to provide structure and a sense of scale against the large built form. Tree planting aligning the infrastructure roads shall provide a distinctive identity to the park, with larger species focussed at key nodes, such as roundabouts, entrance points, etc. Semi Mature trees shall be secured below ground; Extra Heavy Standards double staked with rubber belt and spacer; and Specimen Feathered single staked with a rubber belt and spacer. Where specimen trees and EHS are proposed to be arranged in rows or closely spaced groups these shall be of the same species and specification. Where necessary rabbit guards shall be installed following planting to assist in long term establishment. Tree selection shall include, but shall not necessarily be restricted to the following species.

Species	Form	Minimum	Root Type	Supply	Clear Stem	Tree Pit Size
<i>Acer campestre</i>	Semi-Mature	20-25cm	Rootballed	500-550	min. 200	2000(L) x 2000(W) x 1000(D)
<i>Alnus glutinosa</i>	Semi-Mature	20-25cm	Rootballed	500-550	min. 200	2000(L) x 2000(W) x 1000(D)
<i>Carpinus betulus</i>	Semi-Mature	20-25cm	Rootballed	500-550	min. 200	2000(L) x 2000(W) x 1000(D)
<i>Prunus avium</i>	Semi-Mature	20-25cm	Rootballed	500-550	min. 200	2000(L) x 2000(W) x 1000(D)
<i>Quercus robur</i>	Semi-Mature	20-25cm	Rootballed	500-550	min. 200	2000(L) x 2000(W) x 1000(D)
<i>Salix alba</i>	Semi-Mature	20-25cm	Rootballed	500-550	min. 200	2000(L) x 2000(W) x 1000(D)
<i>Taxodium distichum</i>	Semi-Mature	20-25cm	Rootballed	500-550	min. 200	2000(L) x 2000(W) x 1000(D)
<i>Acer campestre</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Alnus glutinosa</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Betula pendula</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Carpinus betulus</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Populus tremula</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Prunus avium</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Quercus robur</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Salix alba</i>	Extra Heavy Standard	16-20cm	Rootballed	450-500	min. 200	1500(L) x 1500(W) x 1000(D)
<i>Betula pendula</i>	Specimen Feathered	(width 150-200)	Rootballed	min.450		1500(L) x 1500(W) x 1000(D)
<i>Populus tremula</i>	Specimen Feathered	(width 150-200)	Rootballed	min.450		1500(L) x 1500(W) x 1000(D)



## Formal Hedgerow Planting

Single species tree and shrub hedgerows shall be used to frame views; provide height to low level planting; and give a formal edge to ornamental shrub planted areas. Unless abutting alternative fencing, hedgerows shall be supported with a post and 3 wire fence; into trenches wide enough to accommodate root growth; at a minimum density of 5 plants / linear metre and in a double staggered row.

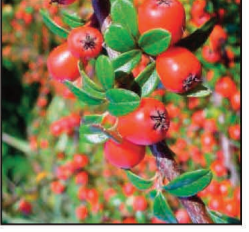
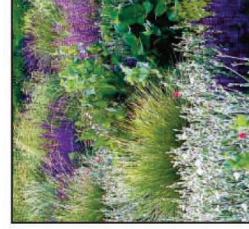
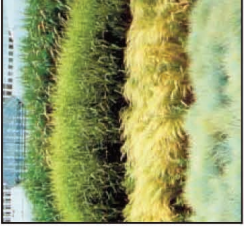
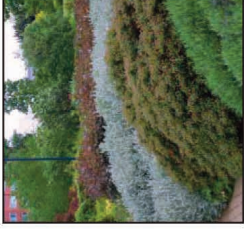
Species	Form	Root Type	Height (cm)
<i>Carpinus betulus</i>	Transplant 1+2	Bagged	100-125
<i>Ligustrum ovalifolium</i>	Cutting 0+2	Bagged	80-100
<i>Ligustrum ovalifolium</i> 'Aureum'	Shrub	Container (15L)	40-60
<i>Photinia x fraseri</i> 'Red Robin'	Shrub	Container (15L)	40-60



## Ornamental Shrubs and Groundcover Planting

Ornamental shrub planting shall be concentrated within accent locations around the development (e.g. roundabout junctions, plot entrance points, etc). Planting shall include a combination of taller specimen shrub species (achieving in excess of one metre ultimate height), low ground cover species (averaging 600mm height) and specimen shrub planting to provide stature at key points. Throughout the development, shrubs shall be planted in single species groups of 2 - 12sqm. Detailed shrub selection shall ensure groundcover shrubs and those of a more compact nature are located nearer to the front of planting beds, with those of a more upright form located further to the rear. Planting design shall take into consideration highway visibility splay requirements, ensuring species selection is appropriate to maintain clear visibility within these areas. Rabbit guards shall be installed to vulnerable species following planting to assist in long term establishment. Plant selection shall include, but shall not necessarily be restricted to the following species.

Species	Supply Size	Density
<i>Amelanchier canadensis</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Amelanchier canadensis</i>	150-175cm 25L	Specimen Shrub
<i>Anemone x hybrida 'Honorine Jobert'</i>	full pot 3L	350c/s (8 plants per m <sup>2</sup> )
<i>Berberis frikartii 'Amstelveen'</i>	30-40cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Berberis verruculosa</i>	30-40cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Calamagrostis x acutiflora 'Karl Foerster'</i>	full pot 3L	400c/s (6 plants per m <sup>2</sup> )
<i>Ceanothus 'Blue Mound'</i>	30-40cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Ceanothus thyrsiflorus repens</i>	30-40cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cistus x corbariensis</i>	30-40cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cornus alba 'Aurea'</i>	60-80cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Cornus alba 'Kesselringii'</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cornus alba 'Sibirica</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cornus alba 'Sibirica</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cornus alba 'Sibirica</i>	125-150cm 25L	Specimen Shrub
<i>Cornus stolonifera 'Flaviramea'</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cornus stolonifera 'Flaviramea'</i>	80-100cm 15L	Specimen Shrub
<i>Cornus stolonifera 'Kelseyi'</i>	30-40cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Corylus avellana</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Cotoneaster cashmiriensis</i>	30-40cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Cotoneaster conspicuus 'Decorus'</i>	30-40cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cotoneaster 'Coral Beauty'</i>	40-60cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Cotoneaster 'Cornubia'</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Cotoneaster franchetii</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cotoneaster microphyllus</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Cotoneaster serotinus</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Crataegus monogyna</i>	40-60cm 1+1 OG	700c/s (2 plants per m <sup>2</sup> )
<i>Eleaegnis x ebbingei</i>	60-80cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Escallonia 'Apple Blossom'</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Euonymus fortunei 'Emerald 'n' Gold'</i>	20-30cm 3L	450c/s (5 plants per m <sup>2</sup> )
<i>Genista lydia</i>	30-40cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Geranium 'Johnson's Blue'</i>	full pot 3L	350c/s (8 plants per m <sup>2</sup> )
<i>Hebe albicans 'Red Edge'</i>	20-30cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Hebe pinguifolia 'Sutherlandii'</i>	20-30cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Hedera helix 'Hibernica'</i>	20-30cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Heuchera 'Greenfinch'</i>	full pot 3L	400c/s (6 plants per m <sup>2</sup> )
<i>Ilex aquifolium 'J.C. van Tol'</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Lonicera nitida 'Maygreen'</i>	40-60cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Lonicera pileata</i>	30-40cm 2L	500c/s (4 plants per m <sup>2</sup> )
<i>Mahonia aquifolium 'Apollo'</i>	15-20cm 2L	400c/s (6 plants per m <sup>2</sup> )
<i>Mahonia x media 'Winter Sun'</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Miscanthus 'Silberfeder'</i>	full pot 3L	400c/s (6 plants per m <sup>2</sup> )
<i>Osmarea burkwoodii</i>	30-40cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Phormium tenax 'Purpureum'</i>	100-120cm 25L	Specimen Shrub
<i>Prunus lusitanica</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Rosa canina</i>	40-60cm 1+1 OG	700c/s (2 plants per m <sup>2</sup> )
<i>Rosa 'White Max Graf'</i>	40-60cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Rubus 'Betty Ashburner'</i>	30-40cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Rudbeckia fulgida 'Goldstrum'</i>	full pot 3L	350c/s (8 plants per m <sup>2</sup> )
<i>Salix eleagnos 'Rosmarinifolia'</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Sambucus nigra 'Black Beauty'</i>	40-60cm 3L	700c/s (2 plants per m <sup>2</sup> )
<i>Spirea japonica 'Firelight'</i>	20-30cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Spirea japonica 'Goldflame'</i>	20-30cm 3L	600c/s (3 plants per m <sup>2</sup> )
<i>Viburnum davidii</i>	20-30cm 3L	500c/s (4 plants per m <sup>2</sup> )
<i>Viburnum tinus 'Eve Price'</i>	30-40cm 3L	350c/s (8 plants per m <sup>2</sup> )
<i>Viburnum opulus</i>	40-60cm 1+1 OG	500c/s (4 plants per m <sup>2</sup> )
<i>Vinca minor</i>	15-20cm 2L	400c/s (6 plants per m <sup>2</sup> )





## Native Woodland Planting

Woodland planted areas shall establish to form the upper canopy structure across the Development. Species selection and percentage mix shall conform to the densities provided below, with plants arranged on a 1.5 x 1.5m grid. Tree species (\*) shall be planted in single species groups of 3-5 within the planting matrix and shrubs planted in single species groups of 7-15. Extra Heavy Standard and Feathered trees shall be planted in single species groups at minimum 3.0m spacing. All woodland planting areas shall be grass seeded with a shade tolerant grass to suppress weed growth and reduce maintenance requirements. Rabbit guards shall be installed following planting to assist in long term establishment.

Species	Form	Girth (cm)	Root Type	Height (cm)	%
<i>Acer campestre</i> *	EHS	14-16	Bagged	425-500	3
<i>Populus nigra var betulifolia</i> *	EHS	14-16	Bagged	425-500	2
<i>Populus tremula</i> *	EHS	14-16	Bagged	425-500	2
<i>Quercus robur</i> *	EHS	14-16	Bagged	425-500	3
<i>Acer campestre</i> *	Feathered		Bagged	175-200	5
<i>Populus nigra var betulifolia</i> *	Feathered		Bagged	175-200	3
<i>Populus tremula</i> *	Feathered		Bagged	175-200	3
<i>Quercus robur</i> *	Feathered		Bagged	175-200	4
<i>Acer campestre</i> *	Transplant (1+1)		Bagged	40-60	4
<i>Corylus avellana</i>	Transplant (1+1)		Bagged	40-60	8
<i>Crataegus monogyna</i>	Transplant (1+1)		Bagged	40-60	38
<i>Ilex aquifolium</i>	Shrub		Container	40-60	4
<i>Populus nigra var betulifolia</i> *	Transplant (1+1)		Bagged	40-60	2
<i>Populus tremula</i> *	Transplant (1+1)		Bagged	40-60	2
<i>Prunus spinosa</i>	Transplant (1+1)		Bagged	40-60	7
<i>Quercus robur</i> *	Transplant (1+1)		Bagged	40-60	4
<i>Salix caprea</i>	Transplant (1+1)		Bagged	40-60	6

## Understorey Native Shrub Planting

Native shrub planting shall be predominate across the development. In combination with Native Woodland planting it shall create the basis of the landscape infrastructure, providing seasonal interest and the creation of wildlife habitat. Species selection and percentage mix shall conform to the densities provided below, with plants arranged on a 1.0 x 1.0m grid in single species groups of 7-15. Native shrub planted areas shall be grass seeded with a shade tolerant grass to suppress weed growth and reduce maintenance input. Rabbit guards shall be installed following planting to assist in the long term establishment.

Species	Form	Root Type	Height (cm)	%
<i>Cornus sanguinea</i>	Transplant (1+1)	Bagged	40-60	10
<i>Cornus alba 'sanguinea'</i>	Transplant (1+1)	Bagged	40-60	10
<i>Cornus stolonifera 'Flaviramea'</i>	Transplant (1+1)	Bagged	40-60	10
<i>Crataegus monogyna</i>	Transplant (1+1)	Bagged	40-60	40
<i>Ilex aquifolium</i>	Shrub (3L)	Container	40-60	5
<i>Prunus spinosa</i>	Transplant (1+1)	Bagged	40-60	10
<i>Salix caprea</i>	Transplant (1+1)	Bagged	40-60	5
<i>Rosa canina</i>	Transplant (1+1)	Bagged	40-60	10

## Native Hedgerow Planting

Native hedgerows shall be used to provide a dense, formal edge to native woodland and understorey planted areas. Incorporating a range of species, they shall provide seasonal interest and create a diverse wildlife habitat. Species selection and percentage mix shall conform to the densities provided below, with plants arranged into trenches wide enough to accommodate root growth; at a minimum density of 5 plants / linear metre; and in a double staggered row. The base of hedgerows shall be mulched to suppress weed growth. Rabbit guards shall be installed following planting to assist in long term establishment.

Species	Form	Root Type	Height (cm)	% Mix
<i>Corylus avellana</i>	Transplant 1+1	Bagged	60-90	25
<i>Crataegus monogyna</i>	Transplant 1+1	Bagged	60-90	25
<i>Ilex aquifolium</i>	Shrub	Container (2L)	30-45	10
<i>Prunus spinosa</i>	Transplant 1+1	Bagged	60-90	15
<i>Rosa canina</i>	Transplant 1+1	Bagged	60-90	10
<i>Viburnum lantana</i>	Transplant 1+1	Bagged	60-90	15

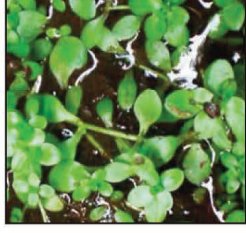




## Wetland Margin / Swale Planting

Native tree and shrub planting shall be established to the upper slopes of wetland areas and swales. Species selection and percentage mix shall conform to the densities provided below, with plants arranged on a 1.0 x 1.0m grid. Tree species (\*) shall be planted in single species groups of 3-5 within the planting matrix and shrubs planted in single species groups of 7-15. Standard trees shall be planted at minimum 3.0m spacings within the matrix. Wetland marginal planting shall include a weed suppress weed growth and reduce maintenance requirements. Rabbit guards shall be installed following planting to assist in long term establishment.

Species	Form	Root Type	Height (cm)	% Mix
<i>Acer campestre</i>	Standard (8-10cm)	Bagged	250-300	2
<i>Alnus glutinosa</i>	Standard (8-10cm)	Bagged	250-300	4
<i>Prunus avium</i>	Standard (8-10cm)	Bagged	250-300	2
<i>Quercus robur</i>	Standard (8-10cm)	Bagged	250-300	2
<i>Salix alba</i>	Standard (8-10cm)	Bagged	250-300	2
<i>Acer campestre*</i>	Transplant (1+1)	Bagged	40-60	3
<i>Alnus glutinosa*</i>	Transplant (1+1)	Bagged	40-60	9
<i>Corylus avellana</i>	Transplant (1+1)	Bagged	40-60	9
<i>Crataegus monogyna</i>	Transplant (1+1)	Bagged	40-60	35
<i>Prunus avium*</i>	Transplant (1+1)	Bagged	40-60	4
<i>Prunus spinosa</i>	Transplant (1+1)	Bagged	40-60	5
<i>Quercus robur*</i>	Transplant (1+1)	Bagged	40-60	5
<i>Salix alba*</i>	Transplant (1+1)	Bagged	40-60	5
<i>Salix caprea</i>	Transplant (1+1)	Bagged	40-60	8
<i>Salix cinerea</i>	Transplant (1+1)	Bagged	40-60	5



## Marginal / Aquatic Planting

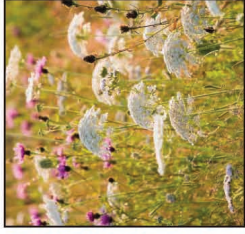
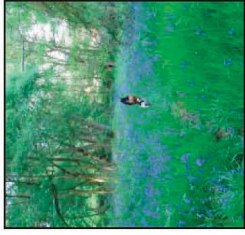
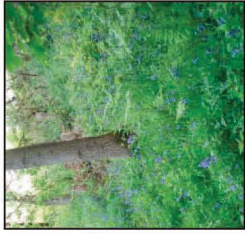
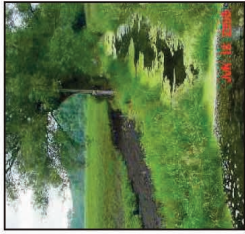
Water bodies and drainage balancing features shall include extensive areas of marginal planting. Shallow planting shelves shall be incorporated into the design of balancing ponds and drainage swales to optimise the visual and habitat benefits of these features. Marginal and aquatic species shall be planted at 5 plants / per sqm. in single species groups of 20-30 plants randomly throughout wetland areas.

Species	Common Name
<i>Callitriche stagnalis</i>	Common water starwort
<i>Lythrum salicaria</i>	Purple-loosestrife
<i>Mentha aquatica</i>	Water mint
<i>Myosotis scorpioides</i>	Water forget me not
<i>Phragmites australis</i>	Common Reed
<i>Potamogeton crispus</i>	Curled pondweed
<i>Potamogeton pectinatus</i>	Fennel-like pondweed
<i>Ranunculus aquatilis</i>	Water crowfoot
<i>Veronica beccabunga</i>	Brooklime



## Seed Mixes

Grass and wildflower seed mixes shall be applied at a rate in accordance with suppliers recommendations. Indicated specification for wildflower areas and wetland / swale areas assumes the use of a clay based landscape fill material. Specification for these areas shall be amended as necessary to reflect findings from soil assessments and agreed with project ecologists prior to sowing.



### Seed Mix for Mown Grass Areas

Seed mix for mown grass areas shall be applied to roadside verges, service corridors, within visibility splays, roundabout margins and soft landscaped areas where a more managed appearance is desired.

Species	% Mix
<i>Festuca rubra rubra</i>	30
<i>Lolium perenne</i>	25
<i>Festuca brevipila</i>	20
<i>Cynosurus cristatus</i>	12.5
<i>Agrostis capillaris</i>	10
<i>Trifolium repens</i>	2.5

### Seed Mix for Wetland / Swale Areas

Seed mix for wetland / swale areas shall be applied to the embankments of balancing ponds, swales and ditches across the development.

Wildflora Species (20%)	Grass Species (80%)
<i>Achillea ptarmica</i>	<i>Agrostis capillaris</i>
<i>Angelica sylvestris</i>	<i>Alopecurus pratensis</i>
<i>Caltha palustris</i>	<i>Anthoxanthum odoratum</i>
<i>Cardamine partensis</i>	<i>Cynosurus cristatus</i>
<i>Filipendula ulmaria</i>	<i>Deschampsia cespitosa</i>
<i>Hypericum tetrapterum</i>	<i>Festuca rubra</i>
<i>Iris pseudacorus</i>	
<i>Lotus pedunculatus</i>	
<i>Lycopus europaeus</i>	
<i>Lythrum salicaria</i>	
<i>Pulicaria dysenterica</i>	
<i>Ranunculus acris</i>	
<i>Scrophularia auriculata</i>	
<i>Silene flos-cuculi</i>	
<i>Succisa pratensis</i>	

### Seed Mix for Shaded Areas

Seed mix for shaded areas shall be applied beneath areas of native woodland planting and understory native shrub planting to suppress weed establishment.

Wildflora Species	% Mix
<i>Festuca rubra</i>	25
<i>Festuca arundinacea</i>	25
<i>Cynosurus cristatus</i>	20
<i>Phleum bertolonii</i>	5
<i>Poa nemoralis</i>	5
<i>Stachys sylvatica</i>	3
<i>Borago officinalis</i>	2.2
<i>Silene dioica</i>	2
<i>Silene latifolia</i>	2
<i>Geum urbanum</i>	2
<i>Teucrium scorodonia</i>	1.5
<i>Galium album</i>	1.1
<i>Torilis japonica</i>	1
<i>Filipendula ulmaria</i>	1
<i>Hypericum perforatum</i>	1
<i>Meiblotus albus</i>	1
<i>Hyacinthoides non-scripta</i>	0.5
<i>Stellaria holostea</i>	0.5
<i>Digitalis purpurea</i>	0.4
<i>Lychnis flos-cuculi</i>	0.4
<i>Clematis vitalba</i>	0.3
<i>Allium ursinum</i>	0.1

### Seed Mix for Wildflower Areas

Seed mix for wildflower areas shall be applied within open areas where a more 'naturalistic' appearance is acceptable and where temporary earthworks are required (e.g. where adjacent plot treatments are still to be determined)

Wildflora Species (20%)	Grass Species (80%)
<i>Achillea millefolium</i>	<i>Agrostis capillaris</i>
<i>Centaurea nigra</i>	<i>Alopecurus pratensis</i>
<i>Galium verum</i>	<i>Anthoxanthum odoratum</i>
<i>Leucanthemum vulgare</i>	<i>Cynosurus cristatus</i>
<i>Lotus corniculatus</i>	<i>Festuca rubra</i>
<i>Plantago lanceolata</i>	<i>Phleum bertolonii</i>
<i>Primula veris</i>	
<i>Prunella vulgaris</i>	
<i>Ranunculus acris</i>	
<i>Rhinanthus minor</i>	
<i>Rumex acetosa</i>	
<i>Silaum silaus</i>	
<i>Silene flos-cuculi</i>	
<i>Trifolium pratense</i>	
<i>Vicia cracca</i>	

## Landscape Soils

The development shall include a significant amount of earth re-profiling, raising the site to circa 3.6m AOD in the north and east and 3.2m AOD in the south west. In addition to the main land raise elements, significant earth shaping shall take place on the individual plots and phases to include mounding and sculpting to enhance enclosure and accommodate drainage requirements. An engineered fill layer shall be used to raise the site and a new 'landscaping soil profile' (to include topsoil and subsoil layers) shall be placed over this fill layer to provide appropriate growing conditions in areas to receive soft landscaping.

Different planting environments require certain soil properties in order to meet their inherent cultural requirements and to minimise the stress caused during transplanting and the establishment phase of a new landscape scheme. In order to ensure that each planting environment has soils that meet its specific requirements, a series of soil types that are likely to be required for the landscape scheme have been identified (see Table 1 below).

Table 1.: Soil Types

Soil Type	Planting Environment
General Purpose Topsoil #	Specimen trees in soft landscape areas Ornamental shrubs and groundcover planting Formal hedgerow planting Native woodland planting Understorey native shrub planting Native hedgerow planting Mown grass areas Meadow grass for shaded areas
Low Fertility Topsoil	Wetland margin / swale planting Marginal / aquatic planting Willflower seeded areas (sp. wildflower) Damp tolerant seeded areas (i.e swales / wetlands)
Landscape Subsoil	All soft landscape areas
Urban Tree Soil	Specimen trees in hard landscape areas
Washed Sand	Specimen trees in hard landscape areas

# localised adjustments to composition and fertility may be made to suit specific requirements of certain species

General Purpose Topsoil shall either have the soil characteristics of Multipurpose Topsoil (as defined within BS33882:2007) or be a manufactured topsoil specifically developed by a suitably qualified soil scientist to meet the demands of the proposed planting types and species.

Low Fertility Topsoil shall either have the soil characteristics of Specific Purpose - Low Fertility Topsoil (as defined within BS33882:2007) or be a manufactured topsoil specifically developed by a suitably qualified soil scientist to meet the demands of the proposed planting types and species.

Landscape Subsoil shall be a Class 4 granular fill material with a moderate to high drainage rate in order to compliment the overlying topsoils. The quality of the subsoil shall be suitable for the proposed planting types and species.

Urban Tree Soil shall be an engineered topsoil specifically designed to leave space for air, water and root growth and prevent subsidence of the surrounding area.

Washed Sand shall be used as subsoil in the lower part of specimen tree pits in hard landscape areas. Washed sand shall be a suitably graded, quarried washed sand that shall provide sufficient porosity when in a compacted state to allow suitable drainage and aeration.

All landscape soils shall be tested to ensure they are not contaminated with hazardous material or substances including controlled waste; or hazardous wastes; or radioactive wastes. All topsoils shall be tested to ensure they do not contain concentrations of toxins, pathogens or other extraneous substances harmful to plant life. All soils shall be handled in accordance with best practice.

Landscape soils shall be deposited to the vertical depths indicated in Table 2 below.

Table 2.: Soil Profiles

Planting Type	Topsoil Thickness	Subsoil Thickness	Soil Profile Thickness
Specimen trees in soft landscape areas	400mm	600mm	1000mm*
Specimen trees in hard landscape areas	600mm	400mm	1000mm
Ornamental shrubs and groundcover planting	300mm	700mm	1000mm*
Formal hedgerow planting	300mm	700mm	1000mm*
Native woodland planting	300mm	700mm	1000mm*
Understorey native shrub planting	300mm	700mm	1000mm*
Native hedgerow planting	300mm	700mm	1000mm*
Wetland margin / swale planting	300mm	200mm	Variable
Marginal / aquatic planting	300mm	200mm	Variable
Mown grass areas	150mm	350mm	500mm
Meadow grass for shaded areas	300mm	700mm	1000mm
Willflower seeded areas	150mm	350mm	500mm
Damp tolerant seeded areas	150mm	350mm	500mm

\* a proportion of this layer may need to be replaced with gravel for drainage or water attenuation purposes.

## Tree Pits

Tree species shall be planted into pits of sizes as indicated in Table 3 below:

Table 3.: Tree Pit Sizes

Tree Size	Tree Pit Size
Whips and feathered trees up to 2.5m in height	600mm diameter x 450mm depth
Formal and informal hedgerows	Trenches sufficient to accommodate roots when fully spread
Standard trees	800 x 800 x 600mm depth
Extra heavy standard and feathered specimen trees	1500 x 1500 x 1000mm depth
Semi mature trees	2000 x 2000 x 1000mm depth



Appendix 2:  
Landscape Management Plan





## Introduction

The requirements for the maintenance of landscape works within the London Gateway Logistics Park and the Variable Structural Landscape Zone are set out below.

The development shall adopt a coherent, strategic and integrated approach to the management and maintenance of the soft landscape components associated with the development; ensuring the successful establishment of vegetation and overall integration works within the surrounding landscape; a management approach that is appropriate to both nature conservation and the users of the site and its amenity.

### Key Objectives

The key objectives shall be:

- To retain and enhance the value of existing landscape features;
- To successfully establish and integrate new landscape proposals and site vegetation with the surrounding landscape;
- To maximise the nature conservation value of both new and existing habitats on the site;
- To accommodate appropriate public use of the site, by promoting a management regime which is appropriate to the site's role;
- To fulfil legal requirements, including nature conservation, environmental protection and general public safety; and
- To ensure the successful establishment and managed growth of all planting and seeded areas.

### Description of the Works

The works shall be applicable to the maintenance of proposed trees, shrubs, hedgerows, woodland planting, mown grass and meadow grass areas to be implemented; any street furniture or paving to be installed; and any existing vegetation to be retained as part of the Development.

Maintenance work within these areas may include:

- Ground preparation;
- Minor topsoiling;
- Grass cutting;
- Edge trimming;
- Tree hedge and shrub pruning;
- General tree care;
- Watering;
- Treatment of pests and diseases;
- Creation of habitat features;
- Woodland management;
- Tree felling;
- Brush removal;
- Rubbish and debris removal;
- Cleaning of hard surfaces to remove moss, algae, chewing gum, etc.
- Cleaning and repairing of damaged street furniture and boundary treatments; and
- The management of drainage swales and wetlands to ensure successful vegetation establishment and functionality.

## Landscape Management Requirements

### General Maintenance Requirements

The following general prescriptions shall apply to management of the development:

- All legally designated weeds or invasive plants (identified in Schedule nine, Part II of the Wildlife and Countryside Act 1981 or the Weeds Act 1959) shall be controlled and disposed of in accordance with relevant Natural England; DEFRA; or Environment Agency guidance
- Vegetation, which suppresses or otherwise inhibits the development of planted species and proper management of habitats shall be restricted and/ or removed;
- Any species which colonise the site, and are incongruous with the planting scheme and / or the surrounding context, shall be removed;
- All herbicides shall be systemic, biodegradable, and non residual, and only used where necessary and appropriate;
- All areas shall be subject to a regular system of litter collection and removal.
- All swale and water body embankments shall be subject to regular vegetation clearance, to ensure that a Manning coefficient of 0.075 can be maintained.
- All permanent water channels shall be subject to regular vegetation clearance, to ensure that a Manning coefficient of 0.01 can be maintained.

## Street Furniture

### Street Furniture

#### **General Maintenance**

Contractors shall undertake the following operations to all street furniture items throughout the life of the development:

- Surface cleaning (in accordance with guidance below);
- Inspect and notify facilities management team of superficial or physical damage to street furniture items; and
- Inspect and tighten (as necessary) all fixtures and fixings.

#### **Cleaning Requirements**

##### Timber Surfaces

- Clean annually with a stiff brush to prevent a verdigris type build up;
- Remove and sand with 100 grit sandpaper any splinters and graffiti; to ensure an even and smooth surface finish.

##### Galvanised Surfaces

- Clean quarterly using a damp cloth and warm soapy water only.

*NB: Scourers and abrasive cleaners are NOT suitable for these types of finish and may damage them.*

##### Powder Coated Surfaces

- Clean quarterly using a damp cloth and warm soapy water only.

*NB: Scourers and abrasive cleaners are NOT suitable for these types of finish and may damage them.*

##### Stainless Steel

- Clean quarterly using a stainless steel polish and a lint free cloth.

*NB: To remove ground in dirt a stainless steel finishing pad may be required.*

##### Concrete

- Clean annually using an abrasive sponge and warm soapy water only.

## **Feature Planting**

### **Semi Mature, Extra Heavy Standard & Specimen Feathered Tree Planting**

#### ***Establishment Maintenance***

To ensure their survival and optimal development, these trees shall be subject to intensive establishment maintenance. Contractors shall undertake the following operations as necessary during the first 24 months after planting:

- Maintenance of a 1.2m diameter weed free area around the base of each tree, through the application of a 75mm depth mulch;
- Treatment against pests and diseases with spraying and dusting;
- Application of a slow release fertiliser around the base of all trees to ensure soil fertility is maintained at appropriate levels;
- The removal of any vandalised, unhealthy or dead specimens as soon as possible and replacement with trees of a similar size to those adjacent, during the next available planting season;
- Inspection, adjustment and maintenance of guards, stakes, anchors and ties;
- Re-firming of plants after strong winds, frost heave or other disturbances;
- Removal of any vandalised, unhealthy or dead trees and replacement with plants of the same specification, during the next available planting season; and
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth.

#### ***Ongoing Maintenance***

Following initial establishment, Contractors shall undertake the following operations as necessary during years 2-12+ after planting:

- The formative pruning of specimens to achieve optimum growth rates and maintain a good shape, clear of any vehicular or pedestrian circulation routes; and
- The removal of redundant guards, stakes and ties at appropriate times to ensure the optimum health of individual trees.

### **Specimen Shrub, Ornamental Shrub and Groundcover Planting**

#### ***Establishment Maintenance***

To ensure the successful establishment of these planting areas, the Contractors shall undertake the following operations as necessary during the first 12 months after planting:

- Hand weeding of planting beds during the first year;
- Application of a translocated herbicide to shrub planting areas;
- Spot treatment, using a glyphosphate based herbicide only (to prevent damage to desired plant material) of herbaceous planting;
- Annual replenishment of mulch to agreed contract levels;
- Application of a slow release fertiliser to ensure soil fertility is maintained at appropriate levels;
- Treatment against pests and diseases with spraying and dusting;
- Pruning of shrubs for floral, foliage and stem colour effect and to remove weak, dead and diseased branches;
- Pruning of species to ensure correct form;
- Pruning of species to promote flowering/berry production/retention (where appropriate);
- Training and tying of shrubs and climbers to walls / frames;
- Remove dead growth and trim herbaceous perennial plants, avoiding damage to any new shoots that have emerged;
- Remove any vandalised, unhealthy, dead or short-living plants (as soon as possible) and replace with plants of a similar size to those adjacent, during the next available planting season;
- Removal of ornamental plants that are losing aesthetic appeal and/or function;
- Maintain and replace frames, ties and guards;
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth.

#### ***Ongoing Maintenance***

Following initial establishment (and in addition to the tasks listed above) Contractors shall also undertake the following operations as necessary during years 2-12+ after planting:

- Heavy pruning of overgrown shrubs and climbers;
- The selective removal of shrubs and other plants from planting beds;
- Removal of redundant guards, stakes and ties at appropriate times to ensure the optimum health of individual plants;

### **Formal Hedgerow Planting**

#### ***General Maintenance***

Contractor shall undertake the following operations within the first 12 months after planting then throughout the life of the development:

- Hand weeding to maintain a 1m diameter weed free area around the base of hedgerow;
- Re-securing of the geotextile weed suppressant fabric with pegs (where applicable);
- Inspect and secure hedgerow support fencing until full hedge establishment;
- Treatment against pests and diseases with spraying and dusting;
- Application of a slow release fertiliser around the base of hedgerow plants to ensure soil fertility is maintained at appropriate levels;
- Trimming to encourage sound bushy growth, avoid large bare areas at the base and to maintain an attractive, consistent and densely clipped form;
- Trimming to a height not exceeding 1.5m within swale areas and 1.2m where outside of swale areas;
- Remove any vandalised, unhealthy or dead plants and replace with plants of a similar size to those adjacent, during the next available planting season;
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth;
- Remove redundant fencing once hedgerow is fully established; and
- Remove any litter and/ or bulky debris to ensure tidiness;



## Structure Planting

### Woodland Understorey Planting

#### **Establishment Maintenance**

To ensure the successful establishment of woodland planting areas, Contractors shall undertake the following operations as necessary during the first 12 months after planting:

- Maintenance of a 1m diameter weed free area around the base of each woodland shrub, through the application of a translocated herbicide;
- Spot treatment of pernicious weeds (e.g. brambles, etc);
- Treatment against pests and diseases with spraying and dusting;
- Application of a slow release fertiliser around the base of all woodland shrubs to ensure soil fertility is maintained at appropriate levels;
- Inspection, adjustment and maintenance of guards, stakes and ties;
- Re-firming of plants after strong winds, frost heave or other disturbances;
- Removal of any vandalised, unhealthy or dead shrubs and replacement with plants of a similar size to those adjacent, during the next available planting season;
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth; and
- Mowing of underlying grassed areas to a height of 50mm, whenever parts of the sward achieve a height of 125mm.

#### **Ongoing Maintenance**

Following initial establishment (and in addition to the tasks listed above) Contractors shall also undertake the following operations as necessary during years 2-12+ after planting:

- Formative pruning to achieve optimum growth rates and maintain a good shape, clear of any vehicular or pedestrian circulation routes;
- Removal of redundant guards, stakes and ties at appropriate times to ensure the optimum health of individual plants;
- Cleaning out and deadwooding operations (as required);
- Thinning of planting to ensure a desirable woodland character (approximately every 10 to 15 years).

### Woodland Specimens

#### **Establishment Maintenance:**

Contractors shall undertake the following operations as necessary during the first 12 months after planting, to ensure the satisfactory establishment and development of the woodland specimens:

- Clearance of any woodland shrub species within a 1m diameter of the base of each tree;
- Maintenance of a 1m diameter weed free area around the base of all woodland specimens, through the application of a translocated herbicide;
- Spot treatment of pernicious weeds (e.g. brambles, etc);
- Treatment against pests and diseases with spraying and dusting;
- Application of a slow release fertiliser around the base of all woodland specimens to ensure soil fertility is maintained at appropriate levels;
- Inspection, adjustment and maintenance of guards, stakes and ties;
- Re-firming of plants after strong winds, frost heave or other disturbances;
- Removal of any vandalised, unhealthy or dead shrubs and replacement with plants of a similar size to those adjacent, during the next available planting season;
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth; and
- Mowing of underlying grassed areas to a height of 50mm, whenever the sward achieves a height of 125mm.

#### **Ongoing Maintenance**

Following initial establishment (and in addition to the tasks listed above) Contractors shall also undertake the following operations as necessary during years 2-12+ after planting:

- Formative pruning to achieve optimum growth rates and maintain a good shape, clear of any vehicular or pedestrian circulation routes;
- Removal of redundant guards, stakes and ties at appropriate times to ensure the optimum health of individual plants;
- Cleaning out and deadwooding operations (as required);
- Thinning of planting to ensure a desirable woodland character (approximately every 10 to 15 years);
- Formative pruning to achieve optimum growth rates and maintain a good shape, clear of any vehicular or pedestrian circulation routes;
- Cleaning out and deadwooding operations (as required); and
- Thinning of planting to ensure a desirable woodland character (approximately every 10 to 15 years).

### Native Hedgerow Planting

#### **General Maintenance**

Contractor shall undertake the following operations within the first 12 months after planting then throughout the life of the development:

- Hand weeding to maintain a 1m diameter weed free area around the base of hedgerow;
- Re-securing of the geotextile weed suppressant fabric with pegs (where applicable);
- Inspect and secure hedgerow support fencing until full hedge establishment;
- Treatment against pests and diseases with spraying and dusting;
- Application of a slow release fertiliser around the base of hedgerow plants to ensure soil fertility is maintained at appropriate levels;
- Trimming to encourage sound bushy growth, avoid large bare areas at the base and to maintain an attractive, consistent and densely clipped form;
- Trimming to a height not exceeding 1.8m where aligning infrastructure corridors and 2.5m in all other areas;
- Remove any vandalised, unhealthy or dead plants as soon as possible and replace with plants of a similar size to those adjacent, during the next available planting season;
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth;
- Remove redundant fencing once hedgerow is fully established; and
- Remove any litter and/ or bulky debris to ensure tidiness;

## **Lagoon / Swale Planting**

### Lagoon / Swale Shrub Planting

#### **Establishment Maintenance:**

Contractors shall undertake the following operations as necessary during the first 12 months after planting, to ensure the satisfactory establishment and development of the lagoon / swale shrub planting areas:

- Re-securing of the geotextile weed suppressant fabric with pegs;
- Treatment against pests and diseases with spraying and dusting;
- Application of a slow release fertiliser around the base of plants to ensure soil fertility is maintained at appropriate levels;
- Inspection, adjustment and maintenance of guards, stakes and ties;
- Re-firming of plants after strong winds, frost heave or other disturbances;
- Remove any vandalised, unhealthy or dead shrubs and replacement with plants of a similar size to those adjacent, during the next available planting season; and
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth.

#### **Ongoing Maintenance**

Following initial establishment (and in addition to the tasks listed above) Contractors shall also undertake the following operations as necessary during years 2-12+ after planting:

- Formative pruning to achieve optimum growth rates and maintain a good shape;
- Removal of redundant guards, stakes and ties at appropriate times to ensure the optimum health of individual plants;
- Cleaning out and deadwooding operations (as required); and
- Thinning to ensure a desirable 'dense brush' character.

### Lagoon / Swale Standard Trees

#### **Establishment Maintenance**

Contractors shall undertake the following operations as necessary during the first 24 months after planting, to ensure the satisfactory establishment and development of the lagoon / swale standard trees:

- Clearance of any shrub species within a 1m diameter of the base of each tree;
- Re-securing of the geotextile weed suppressant fabric with pegs;
- Treatment against pests and diseases with spraying and dusting;
- Application of a slow release fertiliser around the base of all trees to ensure soil fertility is maintained at appropriate levels;
- Inspection, adjustment and maintenance of guards, stakes and ties;
- Re-firming of plants after strong winds, frost heave or other disturbances;
- Remove any vandalised, unhealthy or dead trees and replacement with specimens of the same specification, during the next available planting season; and
- Watering of plants to ensure moisture levels are maintained appropriate for optimum growth.

#### **Ongoing Maintenance**

Following initial establishment (and in addition to the tasks listed above) Contractors shall also undertake the following operations as necessary during years 2-12+ after planting

- Formative pruning to achieve optimum growth rates and maintain a good shape;
- Removal of redundant guards, stakes and ties at appropriate times to ensure the optimum health of individual plants;
- Cleaning out and deadwooding operations (as required); and
- Thinning to ensure a desirable 'dense brush' character.

### Marginal / Aquatic Planting

#### **Establishment Maintenance**

Contractors shall undertake the following operations as necessary throughout the life of the development:

- Remove from site all rubbish and debris from the entire surface of the waterbody, including any partially submerged items;
- Remove from site all invasive weeds from waterbodies by handweeding (digging, forking, hoeing or pulling);
- Maintain clear of obstructive elements / vegetation all inlets and outlets;
- Annually remove (as required) silt from the base of water channels; and
- Remove as required any obstructive elements within the swales to ensure a desirable character.



## Grassland

### Mown Grass

#### **Establishment Maintenance**

Contractors shall undertake a 'first cut' once the grass has achieved an initial growth of 75mm. The sward shall be mown to a height of 40mm and the mower shall have no roller and be sufficiently sharp to avoid root pulling.

#### **Ongoing Maintenance**

Following initial establishment Contractors shall undertake the following operations as necessary throughout the life of the development:

- Mowing the established grass sward with a rotary machine to a height of 50mm, whenever the sward achieves a height exceeding 75mm;
- Edging off all paths and kerb edges prior to the mowing season;
- Frequent trimming (or herbicide control) of areas where grass abuts structures such as fences or walls, and around trees and obstacles;
- Watering of areas, using a fine rose spray, to ensure moisture levels are maintained appropriate to develop healthy sward growth;
- Reinstatement and repair of damaged or worn areas including ruts, molehills, etc. (to maintain a healthy, vigorous sward, free from disease, fungal growth, discolouration, scorch or wilt); and
- Application of a selective herbicide, suitable for suppressing perennial weeds

### Wildflora & Damp Grassland

#### **Establishment Maintenance**

Contractors shall undertake a 'first cut' once the grass has achieved an initial growth of 75-100mm. The sward shall be mown to a height of 50mm and the mower shall have no roller and be sufficiently sharp to avoid root pulling.

#### **Ongoing Maintenance**

Following initial establishment Contractors shall undertake the following operations as necessary throughout the life of the development:

- 2no. cut per annum of wildflora areas. Mowing to be undertaken at the middle and end of each growing season and to a height of 50mm;
- 2no. cut per annum of grassland areas (or more if required in order to maintain a Manning coefficient of 0.075). Mowing to be undertaken at the middle and end of each growing season and to a height of 50mm;
- Removing arisings from all areas following each cut, to ensure nutrient levels are kept to a minimum;
- The annual control of undesirable herbaceous species through the sensitive modification of mowing regimes, hand pulling or weed wiping/ spot spraying with herbicides;
- The cutting back at regular intervals (at least every 1-2 years) of any brambles or other noxious weeds which establish within these areas, and;
- The re-sowing, and where necessary resolution of any underlying problems, of areas where grass/ flora swards fail to establish or die out.

## Existing Vegetation

### Existing Vegetation (to be retained)

#### **General Maintenance**

Existing vegetation shall be subject to a high level of protection and monitoring to ensure their health is maintained throughout the life of the development. Contractors shall (as required) undertake the following operations to existing trees to be retained:

- Selective pruning to ensure appropriate spacing in relation to screening requirements and the satisfactory development of the trees for their ecological value, without the trees becoming elongated as a result of overcrowding;
- Crown reduction, shaping, lifting and thinning (as required);
- Cleaning out and deadwooding operations (as required);
- Thinning to ensure a desirable woodland character (approximately every 10 to 15 years); and
- Remove from site any arisings which result from works to existing trees.

All maintenance activities shall be undertaken in accordance with BS3998 and be carefully monitored to eliminate undue stress. Contractors shall comply with the current Forestry and Arboriculture Safety & Training Council (FASTCO) recommendations in relation to all aspects of the arboricultural works.



# Maintenance Schedule

## Street Furniture

### General Maintenance Requirements

- Visual checks for superficial damage
- Repairs to street furniture
- Inspect and secure all fixtures and fittings
- Clean timber surfaces to remove vermin build up
- Remove splinters / graffiti to timber surfaces
- Cleaning of metal surfaces
- Cleaning of concrete surfaces

## Feature Planting

### General Maintenance Requirements

- Spraying or dusting of trees against pests and disease:
- Application of fertiliser to base
- Inspection, adjustment and maintenance of stakes and ties
- Replace damaged / vandalised / unhealthy stock
- Watering of area to ensure moisture levels are appropriate
- Removal of redundant guards, fencing, stakes and ties
- Removal of litter

## Semi Mature, Extra Heavy Standard & Specimen Feathered Tree Planting

### General Maintenance Requirements

- 1-5 Weed control around base of each tree
- 1-5 Re-firming of trees after strong winds
- 7-12+ Selective thinning for optimum growth
- 7-12+ Formative pruning for optimum growth

## Specimen, Shrub, Ornamental Shrub and Groundcover Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 2-5 Herbicide treatment of shrub planting area
- 1-5 Spot treatment of herbaceous areas
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 1-12+ Formative pruning and removal of dead growth
- 1-12+ Remove dead growth and trim herbaceous species
- 7-12+ Selective thinning for optimum growth
- 7-12+ Heavy pruning of overgrown shrubs and climber

## Formal Hedgerow Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 1-5 Re-firming of hedgerow to encourage bushy growth
- 5-12+ Trimming of hedgerow to maintain height and clipped form

## Structure Planting

### General Maintenance Requirements

- 1-5 Spraying or dusting of trees against pests and disease:
- 1-5 Application of fertiliser to base
- 1-5 Inspect and secure all fixtures and fittings
- 1-12+ Replace damaged / vandalised / unhealthy stock
- 1-5 Watering of area to ensure moisture levels are appropriate
- 1-12+ Removal of redundant guards, fencing, stakes and ties
- 1-12+ Removal of litter

## Woodland Understorey Planting

### General Maintenance Requirements

- 1-5 Weed control around the base of each plant
- 1-5 Spot treatment of pernicious weeds (e.g. Brambles)
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 1-5 Selective thinning for optimum growth
- 1-5 Mowing of underlying grassed area
- 5-12+ Formative pruning for optimum growth and form

## Woodland Specimens

### General Maintenance Requirements

- 1-5 Clearance of woodland shrubs
- 1-5 Weed control around base of each tree
- 1-5 Spot treatment of pernicious weeds (e.g. Brambles)
- 1-5 Re-firming of trees after strong winds
- 1-5 Mowing of underlying grassed area
- 7-12+ Formative pruning for optimum growth

## Native Hedgerow Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 1-5 Trimming of hedgerow to encourage bushy growth
- 5-12+ Trimming of hedgerow to maintain height and clipped form

## Lagoon Swale Planting

### General Maintenance Requirements

- 1-5 Spraying or dusting of trees against pests and disease:
- 1-5 Application of fertiliser to base
- 1-5 Inspect and secure all fixtures and fittings
- 1-12+ Replace damaged / vandalised / unhealthy stock
- 1-5 Watering of area to ensure moisture levels are appropriate
- 1-12+ Removal of redundant guards, fencing, stakes and ties
- 1-12+ Removal of litter

## Lagoon / Swale Shrub Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 3-12+ Selective thinning for optimum growth
- 5-12+ Formative pruning for optimum growth

## Lagoon / Swale Standard Trees

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of trees after strong winds, frost heave, etc
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 3-12+ Selective thinning to retain a dense brush character
- 7-12+ Formative pruning for optimum growth

## Marginal / Aquatic Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 3-12+ Removal (as required) of excess silt

## Grassland

### General Maintenance Requirements

- 1-12+ Removal of litter

## Mown Grass

### General Maintenance Requirements

- 1-12+ Mowing of grass with a rotary machine
- 1-12+ Edging off paths and kerb edges
- 1-12+ Trimming of grass areas abutting structure
- 1-12+ Replacement of damaged or worn areas
- 1-12+ Application of selective herbicide
- 1-5 Watering of area to ensure moisture levels are appropriate

## Wildflower & Damp Grassland

### General Maintenance Requirements

- 1-12+ Trimming of grass areas and removal of risings
- 1-5 Weed control to remove undesirable herbaceous species
- 1-5 Cutting back of pernicious weeds (e.g. Brambles)

## Existing Vegetation

### Existing Vegetation (to be retained)

- 7-12+ Cleaning out, deadwooding and thinning
- 7-12+ Crown reduction, shaping, lifting and thinning
- 7-12+ Formative pruning for optimum growth
- 1-12+ Removal of litter

## Street Furniture

### General Maintenance Requirements

- 4 x Annually Visual checks for superficial damage
- As necessary Repairs to street furniture
- 4 x Annually Inspect and secure all fixtures and fittings
- Annually Clean timber surfaces to remove vermin build up
- 4 x Annually Remove splinters / graffiti to timber surfaces
- 4 x Annually Cleaning of metal surfaces
- Annually Cleaning of concrete surfaces

## Feature Planting

### General Maintenance Requirements

- 1-5 Spraying or dusting of trees against pests and disease:
- 1-5 Application of fertiliser to base
- 1-5 Inspect and secure all fixtures and fittings
- 1-12+ Replace damaged / vandalised / unhealthy stock
- 1-12+ Watering of area to ensure moisture levels are appropriate
- 1-12+ Removal of redundant guards, fencing, stakes and ties
- 1-12+ Removal of litter

## Semi Mature, Extra Heavy Standard & Specimen Feathered Tree Planting

### General Maintenance Requirements

- 1-5 Weed control around base of each tree
- 1-5 Re-firming of trees after strong winds
- 7-12+ Selective thinning for optimum growth
- 7-12+ Formative pruning for optimum growth

## Specimen, Shrub, Ornamental Shrub and Groundcover Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 2-5 Herbicide treatment of shrub planting area
- 1-5 Spot treatment of herbaceous areas
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 1-12+ Formative pruning and removal of dead growth
- 1-12+ Remove dead growth and trim herbaceous species
- 7-12+ Selective thinning for optimum growth
- 7-12+ Heavy pruning of overgrown shrubs and climber

## Formal Hedgerow Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 1-5 Re-firming of hedgerow to encourage bushy growth
- 5-12+ Trimming of hedgerow to maintain height and clipped form

## Structure Planting

### General Maintenance Requirements

- 1-5 Spraying or dusting of trees against pests and disease:
- 1-5 Application of fertiliser to base
- 1-5 Inspect and secure all fixtures and fittings
- 1-12+ Replace damaged / vandalised / unhealthy stock
- 1-5 Watering of area to ensure moisture levels are appropriate
- 1-12+ Removal of redundant guards, fencing, stakes and ties
- 1-12+ Removal of litter

## Woodland Understorey Planting

### General Maintenance Requirements

- 1-5 Weed control around the base of each plant
- 1-5 Spot treatment of pernicious weeds (e.g. Brambles)
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 1-5 Selective thinning for optimum growth
- 1-5 Mowing of underlying grassed area
- 5-12+ Formative pruning for optimum growth and form

## Woodland Specimens

### General Maintenance Requirements

- 1-5 Clearance of woodland shrubs
- 1-5 Weed control around base of each tree
- 1-5 Spot treatment of pernicious weeds (e.g. Brambles)
- 1-5 Re-firming of trees after strong winds
- 1-5 Mowing of underlying grassed area
- 7-12+ Formative pruning for optimum growth

## Native Hedgerow Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 1-5 Trimming of hedgerow to encourage bushy growth
- 5-12+ Trimming of hedgerow to maintain height and clipped form

## Street Furniture

### General Maintenance Requirements

- 4 x Annually Visual checks for superficial damage
- As necessary Repairs to street furniture
- 4 x Annually Inspect and secure all fixtures and fittings
- Annually Clean timber surfaces to remove vermin build up
- 4 x Annually Remove splinters / graffiti to timber surfaces
- 4 x Annually Cleaning of metal surfaces
- Annually Cleaning of concrete surfaces

## Feature Planting

### General Maintenance Requirements

- 1-5 Spraying or dusting of trees against pests and disease:
- 1-5 Application of fertiliser to base
- 1-5 Inspect and secure all fixtures and fittings
- 1-12+ Replace damaged / vandalised / unhealthy stock
- 1-5 Watering of area to ensure moisture levels are appropriate
- 1-12+ Removal of redundant guards, fencing, stakes and ties
- 1-12+ Removal of litter

## Lagoon Swale Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 3-12+ Selective thinning for optimum growth
- 5-12+ Formative pruning for optimum growth

## Lagoon / Swale Shrub Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of trees after strong winds, frost heave, etc
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 3-12+ Selective thinning to retain a dense brush character
- 7-12+ Formative pruning for optimum growth

## Lagoon / Swale Standard Trees

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 1-5 Re-firming of plants after strong winds, frost heave, etc
- 3-12+ Selective thinning to retain a dense brush character
- 7-12+ Formative pruning for optimum growth

## Marginal / Aquatic Planting

### General Maintenance Requirements

- 1-5 Hand weeding to control weed establishment
- 1-5 Re-securing of weed suppressant fabric
- 3-12+ Removal (as required) of excess silt

## Grassland

### General Maintenance Requirements

- 1-12+ Removal of litter

## Mown Grass

### General Maintenance Requirements

- 1-12+ Mowing of grass with a rotary machine
- 1-12+ Edging off paths and kerb edges
- 1-12+ Trimming of grass areas abutting structure
- 1-12+ Replacement of damaged or worn areas
- 1-12+ Application of selective herbicide
- 1-5 Watering of area to ensure moisture levels are appropriate

## Wildflower & Damp Grassland

### General Maintenance Requirements

- 1-12+ Trimming of grass areas and removal of risings
- 1-5 Weed control to remove undesirable herbaceous species
- 1-5 Cutting back of pernicious weeds (e.g. Brambles)

## Existing Vegetation

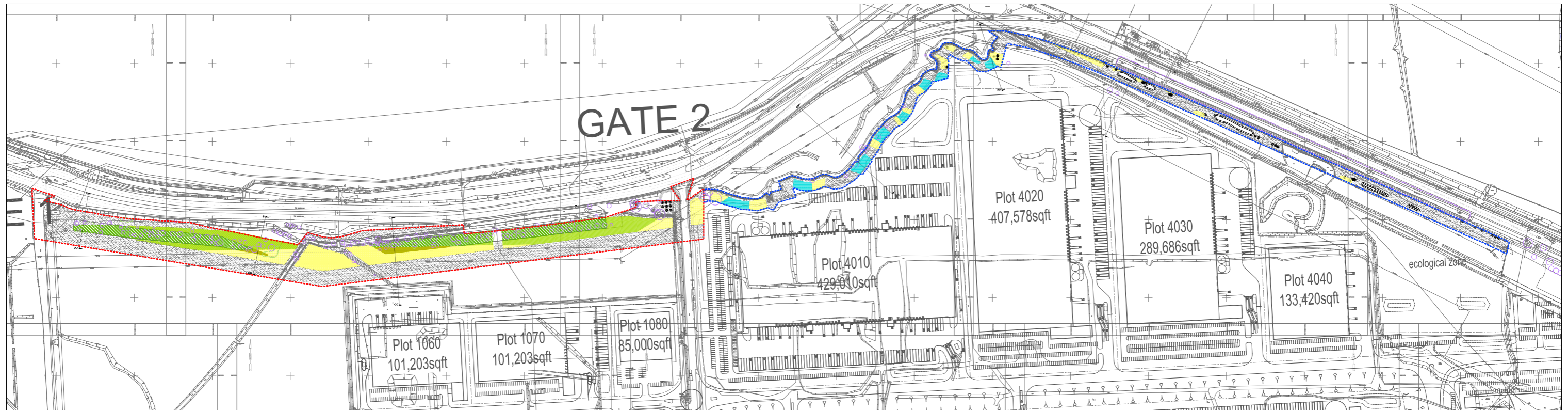
### Existing Vegetation (to be retained)

- 7-12+ Cleaning out, deadwooding and thinning
- 7-12+ Crown reduction, shaping, lifting and thinning
- 7-12+ Formative pruning for optimum growth
- 1-12+ Removal of litter

Appendix 3:  
Structural Landscape Plans



## Structural Landscape Location Plan



### LEGEND

- Boundaries**
- Zone 1A - Variable Structural Landscape Zone
  - Zone 1B - Fixed Structural Landscape Zone
- General**
- Section Line
- Existing Vegetation (to be retained)**
- Woodland / Scrub
  - Individual Trees
  - Grassland
- Proposed Planting**
- Individual Specimen Trees (species to be as listed in planting schedule)
  - Woodland Matrix 1 - Infill to Existing Planting
  - Woodland Matrix 1 - Proposed New Planting
  - Woodland Matrix 2 - Proposed New Planting
  - Understorey Matrix - Infill to Existing Planting
  - Understorey Matrix - Proposed New Planting
- Proposed Ecology**
- Proposed refugia / Hibernacula to be constructed in accordance with ecologists recommendations

- Existing Infrastructure (to be retained)**
- Roads / Highways
  - Pylons
- Levels / Contours**
- Existing Contours
  - Existing Spot Level
  - Existing Slopes / Ditches
  - Proposed Spot Levels
  - Proposed Slopes / Gradients

### PLANTING SCHEDULE

**Extra Heavy Standard Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below.

14-16cm girth  
4.25-5.0m height  
1.8-2.1m clear stem

**Feathered Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below.

1.75-2.0m height 2x transplanted  
Well furnished with lateral shoots to base  
Rootballed

#### Proposed Woodland Planting Mix 1 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size	Quantity	Notes
5	Carpinus betulus*	Hornbeam	400-600mm 1+1	Bagged	
15	Corylus avellana	Hazel	400-600mm 1+1	Bagged	
5	Populus nigra var betulifolia	Black Poplar	400-600mm 1+1	Bagged	
40	Crataegus monogyna	Hawthorn	400-600mm 1+1	Bagged	
5	Ilex aquifolium	Holly	400-600mm 3L	Containerised	
10	Salix alba*	White willow	400-600mm 1+1	Bagged	
10	Salix caprea	Goat willow	400-600mm 1+1	Bagged	
10	Quercus robur*	Pedunculate Oak	400-600mm 1+1	Bagged	

#### Feathered Trees (1.75-2.0m High)

Species are to be as listed above for transplant trees.

#### Proposed Woodland Planting Mix 2 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size	Quantity	Notes
5	Acer campestre*	Field Maple	400-600mm 1+1	Bagged	
10	Alnus glutinosa*	Alder	400-600mm 1+1	Bagged	
10	Corylus avellana	Hazel	400-600mm 1+1	Bagged	
40	Crataegus monogyna	Hawthorn	400-600mm 1+1	Bagged	
5	Salix alba*	White willow	400-600mm 1+1	Bagged	
10	Salix caprea	Goat willow	400-600mm 1+1	Bagged	
5	Salix cinerea	Sallow	400-600mm 1+1	Bagged	
5	Prunus avium*	Wild Cherry	400-600mm 1+1	Bagged	
5	Prunus spinosa	Blackthorn	400-600mm 1+1	Bagged	
5	Quercus robur*	Pedunculate Oak	400-600mm 1+1	Bagged	

#### Feathered Trees (1.75-2.0m High)

Species are to be as listed above for transplant trees.

#### Proposed Understorey Shrub Planting Mix (refer to planting matrix drawing 2)

Transplants planted in groups of 7-15 of the same species on a 1.0m grid. Rows parallel to the Manorway are to be 1.5m apart to allow adequate maintenance access.

%	Species	Common Name	Supply size	Quantity	Notes
5	Cornus sanguinea	Dogwood	400-600mm 1+1	Bagged	
50	Crataegus monogyna	Hawthorn	400-600mm 1+1	Bagged	
5	Ilex aquifolium	Holly	400-600mm 3L	Containerised	
15	Prunus spinosa	Blackthorn	400-600mm 1+1	Bagged	
5	Salix caprea	Goat Willow	400-600mm 1+1	Bagged	
5	Salix cinerea	Sallow	400-600mm 1+1	Bagged	
15	Rosa canina	Dog rose	400-600mm 1+1	Bagged	

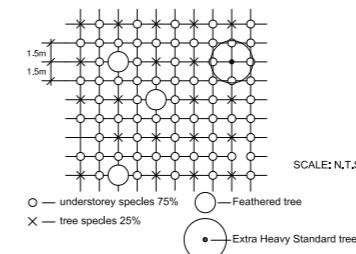
#### Marginal Aquatic Planting to Proposed Scrapes

Scrapes to have gently sloping banks to allow colonisation by marginal aquatic species. Sediment and selected vegetation to be translocated from adjacent pools in accordance with ecologists' recommendations.

**Note:**  
All trees and shrub species to be of native provenance where possible.

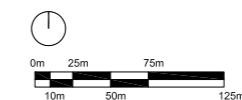
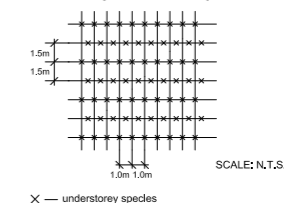
#### Planting Matrix Drawing 1

- Woodland Thicket Mix



#### Planting Matrix Drawing 2

- Woodland Edge Thicket Mix Planting



Rev	Date	By	Notes
D	28.02.2013	PD	Inclusion of LDO in planting plan
C	18.02.2013	PD	Amendments to planting plan following client comments
E	15.05.13	PD	Locations of existing vegetation added
B	26.04.13	PD	Locations of existing vegetation added
A	14.01.13	PD	Woodland planting mix 1 amended to respond to comments from ecologists

Client: DP World (P&O Estates)

Project: London Gateway

Drawing Title: London Gateway Zone 1A & 1B Structural Landscape Location Plan

Drawing Status: For Planning

Scale: 1:2500@A1 Date: 09.11.07 Drawn: PD

Drawing No: 04 4901 04 000E IR Checked: IR Approved: IR

LAND PLANNING BY DESIGN

LOVEJOY

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Caxton House 1 Fore Street Birmingham B2 5ER

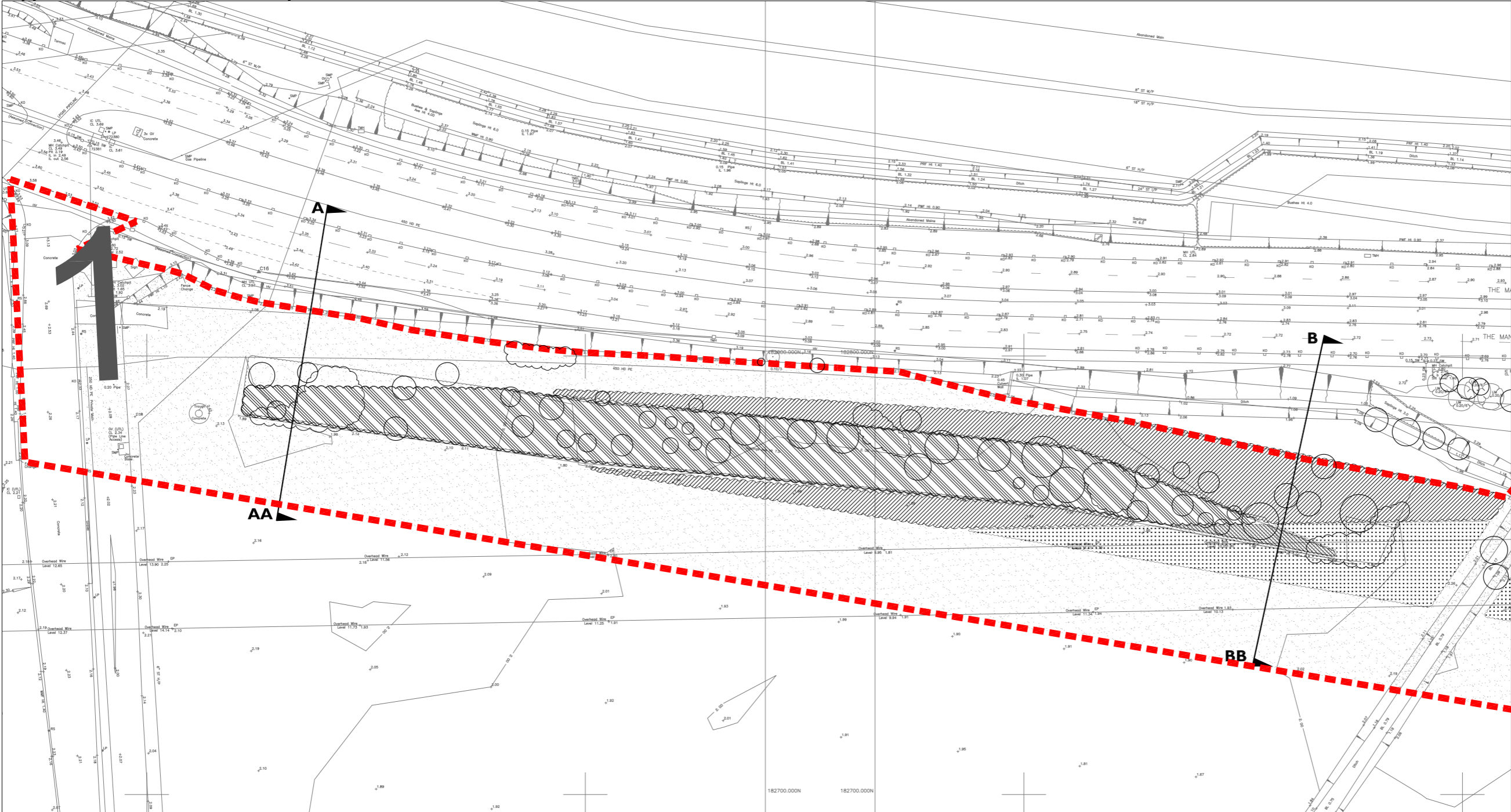
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BIRMINGHAM LONDON



# Appendix 3: Structural Landscape Plans



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### LEGEND

#### Boundaries

- Zone 1A - Variable Structural Landscape Zone
- Zone 1B - Fixed Structural Landscape Zone

#### General

- Section Line

#### Existing Vegetation (to be retained)

- Woodland / Scrub
- Individual Trees
- Grassland

#### Proposed Planting

- Individual Specimen Trees (species to be as listed in planting schedule)
- Woodland Matrix 1 - Infill to Existing Planting
- Woodland Matrix 1 - Proposed New Planting
- Woodland Matrix 2 - Proposed New Planting
- Understorey Matrix - Infill to Existing Planting
- Understorey Matrix - Proposed New Planting

#### Proposed Ecology

- Proposed refugia / hibernacula to be constructed in accordance with ecologists recommendations

#### Existing Infrastructure (to be retained)

- Roads / Highways
- Pylons

#### Levels / Contours

- Existing Contours
- Existing Spot Level
- Existing Slopes / Ditches
- Proposed Spot Levels
- Proposed Slopes / Gradients

0m 5m 15m 25m  
2.5m 10m 25m

Rev	Date	By	Notes
E	20.02.2013	PD	Inclusion of LDO Master Plan
D	15.02.2013	PD	Annotations amended following client comments
C	29.04.08	PD	Locations of existing vegetation added
B	14.01.08	PD	Woodland Planting Mx. 1 amended in response to comments from planners
A	09.11.07	PD	Pipeline easements for planting areas increased to 6m and service easements removed from drawing

Client  
**DP World (P&O Estates)**

Project  
**London Gateway**

Drawing Title  
**London Gateway Zone 1A & 1B Planting Proposals**

Drawing Status  
**For Planning**

Scale	Date	Drawn
1:500@A1	25.09.07	PD

Drawing No.	Checked	Approved
04 4901 04 001E IR	IR	IR

LAND PLANNING BY DESIGN **LOVEJOY**

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BIRMINGHAM LONDON

## PLANTING SCHEDULE

**Extra Heavy Standard Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

14-16cm girth  
4.25-5.0m height  
1.8-2.1m clear stem

**Feathered Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

1.75-2.0m height 2x transplanted  
Well furnished with lateral shoots to base  
Rootballed

### Proposed Woodland Planting Mix 1 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size
5	Carpinus betulus*	Hornbeam	400-600mm 1+1 Bagged
15	Corylus avellana	Hazel	400-600mm 1+1 Bagged
5	Populus nigra var. betulaefolia	Black Poplar	400-600mm 1+1 Bagged
40	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Salix alba*	White willow	400-600mm 1+1 Bagged
10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
5	Salix cinerea	Sallow	400-600mm 1+1 Bagged
5	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
Species are to be as listed above for transplant trees.

### Proposed Woodland Planting Mix 2 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size
5	Acer campestre*	Field Maple	400-600mm 1+1 Bagged
10	Alnus glutinosa*	Alder	400-600mm 1+1 Bagged
10	Corylus avellana	Hazel	400-600mm 1+1 Bagged
40	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Salix alba*	White willow	400-600mm 1+1 Bagged
10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
5	Salix cinerea	Sallow	400-600mm 1+1 Bagged
5	Prunus avium*	Wild Cherry	400-600mm 1+1 Bagged
5	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
Species are to be as listed above for transplant trees.

### Proposed Understorey Shrub Planting Mix (refer to planting matrix drawing 2)

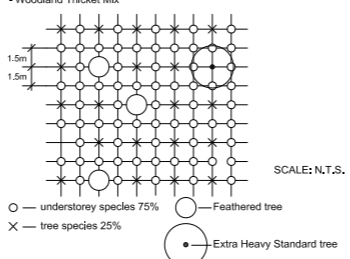
Transplants planted in groups of 7-15 of the same species on a 1.0m grid. Rows parallel to the Manonway are to be 1.5m apart to allow adequate maintenance access.

%	Species	Common Name	Supply size
5	Cornus sanguinea	Dogwood	400-600mm 1+1 Bagged
50	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Ilex aquifolium	Holly	400-600mm 3L Contalherised
15	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Salix caprea	Goat Willow	400-600mm 1+1 Bagged
5	Salix cinerea	Sallow	400-600mm 1+1 Bagged
15	Rosa canina	Dog rose	400-600mm 1+1 Bagged

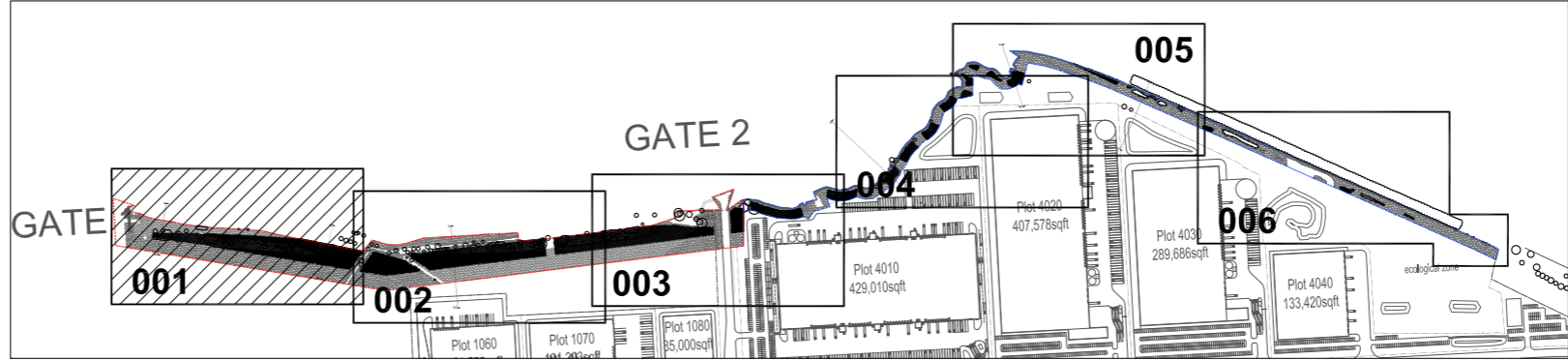
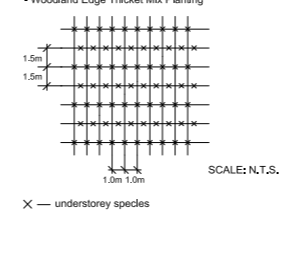
**Marginal Aquatic Planting to Proposed Scrapes**  
Scrapes to have gently sloping banks to allow colonisation by marginal aquatic species. Sediment and selected vegetation to be translocated from adjacent pools in accordance with ecologists recommendations.

**Note:**  
All trees and shrub species to be of native provenance where possible.

### Planting Matrix Drawing 1 - Woodland Thicket Mix



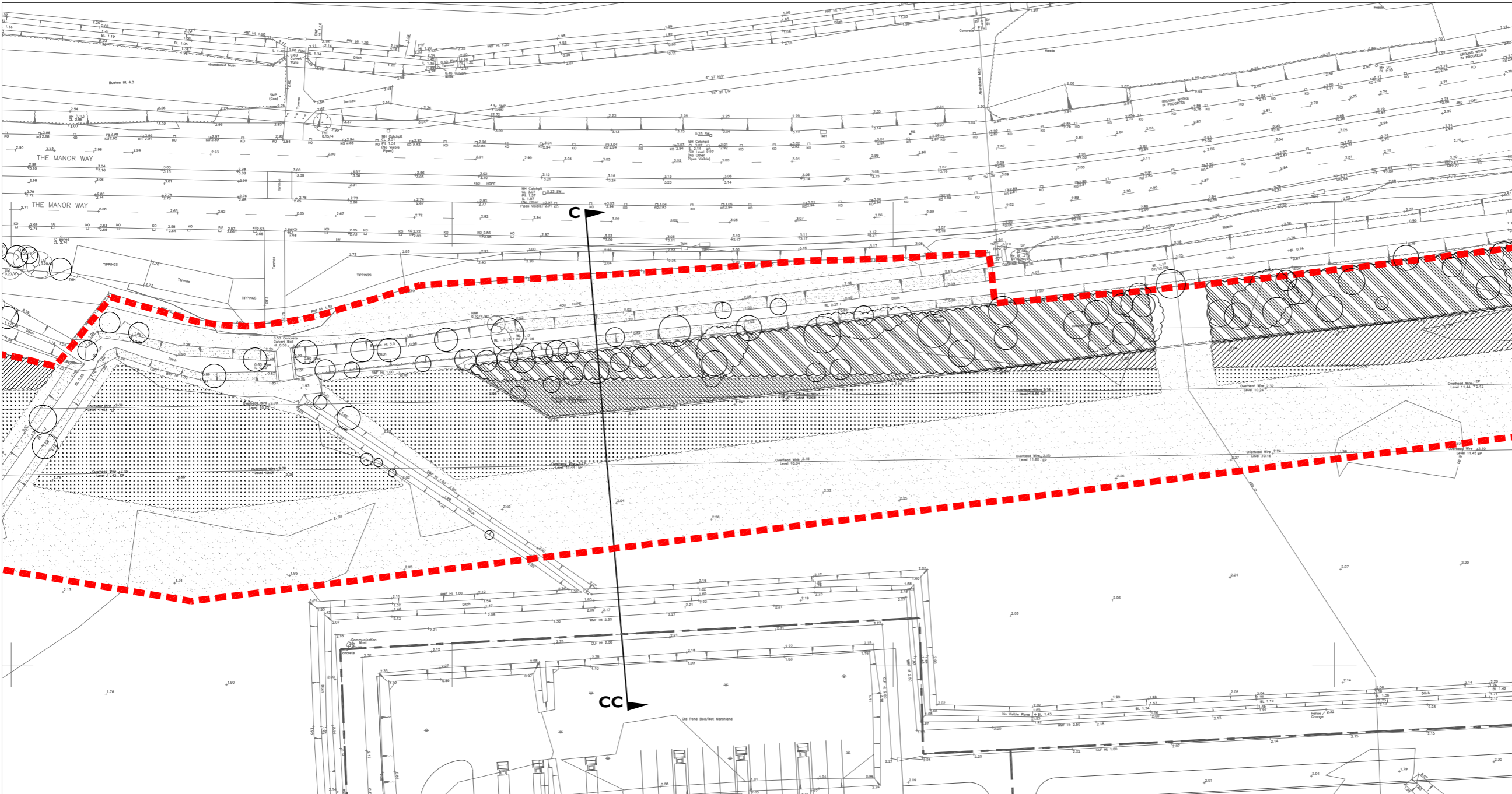
### Planting Matrix Drawing 2 - Woodland Edge Thicket Mix Planting





# Appendix 3: Structural Landscape Plans

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- LEGEND**  
**Boundaries**  
 - Zone 1A - Variable Structural Landscape Zone  
 - Zone 1B - Fixed Structural Landscape Zone

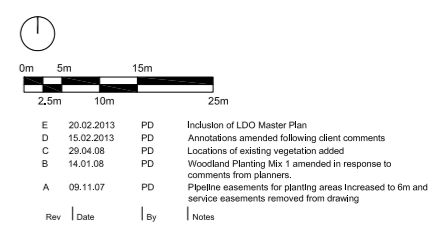
- General**  
 - Section Line  
**Existing Vegetation (to be retained)**  
 - Woodland / Scrub  
 - Individual Trees  
 - Grassland

- Proposed Planting**  
 - Individual Specimen Trees (species to be as listed in planting schedule)  
 - Woodland Matrix 1 - Infill to Existing Planting  
 - Woodland Matrix 1 - Proposed New Planting  
 - Woodland Matrix 2 - Proposed New Planting  
 - Understorey Matrix - Infill to Existing Planting  
 - Understorey Matrix - Proposed New Planting

- Proposed Ecology**  
 - Proposed refugia / hibernacula to be constructed in accordance with ecologists recommendations

- Existing Infrastructure (to be retained)**  
 - Roads / Highways  
 - Pylons

- Levels / Contours**  
 - Existing Contours  
 - Existing Spot Level  
 - Existing Slopes / Ditches  
 - Proposed Spot Levels  
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## PLANTING SCHEDULE

**Extra Heavy Standard Trees**  
 Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

14-16cm girth  
 4.25-5.0m height  
 1.8-2.1m clear stem

**Feathered Trees**  
 Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

1.75-2.0m height 2x transplanted  
 Well furnished with lateral shoots to base  
 Rootballed

### Proposed Woodland Planting Mix 1 (refer to planting matrix drawing 1)

%	Species	Common Name	Supply size
5	Carpinus betulus*	Hornbeam	400-600mm 1+1 Bagged
15	Corylus avellana	Hazel	400-600mm 1+1 Bagged
5	Populus nigra var betulifolia	Black Poplar	400-600mm 1+1 Bagged
40	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Salix alba*	White willow	400-600mm 1+1 Bagged
10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
10	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
 Species are to be as listed above for transplant trees.

### Proposed Woodland Planting Mix 2 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size
5	Acer campestre*	Field Maple	400-600mm 1+1 Bagged
10	Alnus glutinosa*	Alder	400-600mm 1+1 Bagged
10	Corylus avellana	Hazel	400-600mm 1+1 Bagged
40	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Salix alba*	White willow	400-600mm 1+1 Bagged
10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
5	Salix chereia	Sallow	400-600mm 1+1 Bagged
5	Prunus avium*	Wild Cherry	400-600mm 1+1 Bagged
5	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m High)**  
 Species are to be as listed above for transplant trees.

### Proposed Understorey Shrub Planting Mix (refer to planting matrix drawing 2)

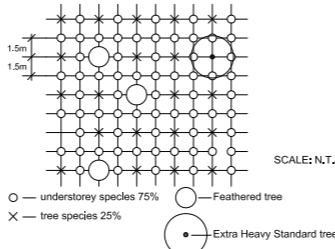
Transplants planted in groups of 7-15 of the same species on a 1.0m grid. Rows parallel to the Manoway are to be 1.5m apart to allow adequate maintenance access.

%	Species	Common Name	Supply size
5	Cornus sanguinea	Dogwood	400-600mm 1+1 Bagged
50	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Ilex aquifolium	Holly	400-600mm 3L Contalherised
15	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Salix caprea	Goat Willow	400-600mm 1+1 Bagged
5	Salix chereia	Sallow	400-600mm 1+1 Bagged
15	Rosa canina	Dog rose	400-600mm 1+1 Bagged

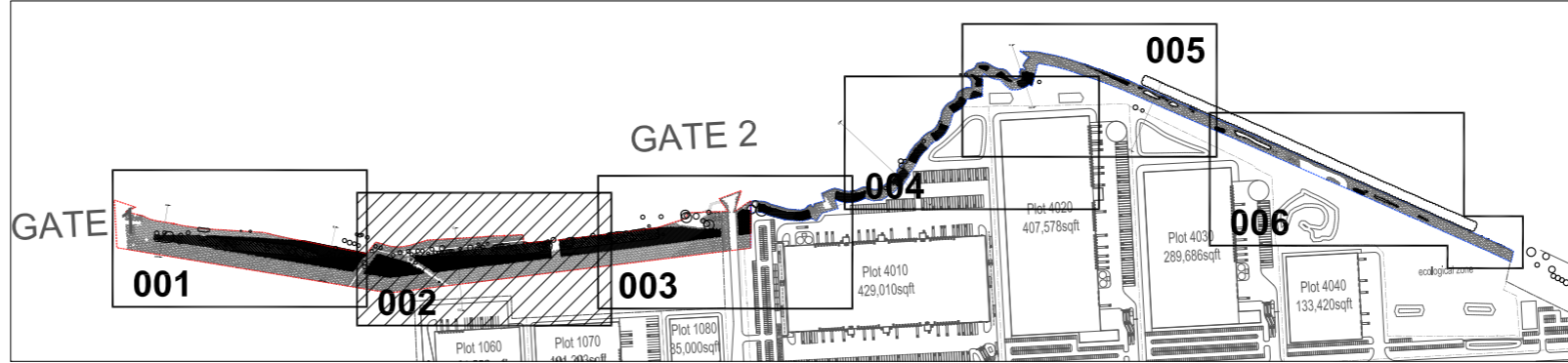
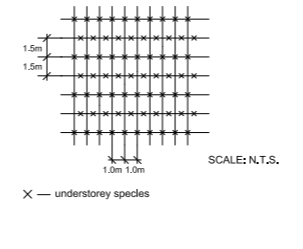
**Marginal Aquatic Planting to Proposed Scrapes**  
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**Note:**  
 All trees and shrub species to be of native provenance where possible.

### Planting Matrix Drawing 1 - Woodland Thicket Mix



### Planting Matrix Drawing 2 - Woodland Edge Thicket Mix Planting



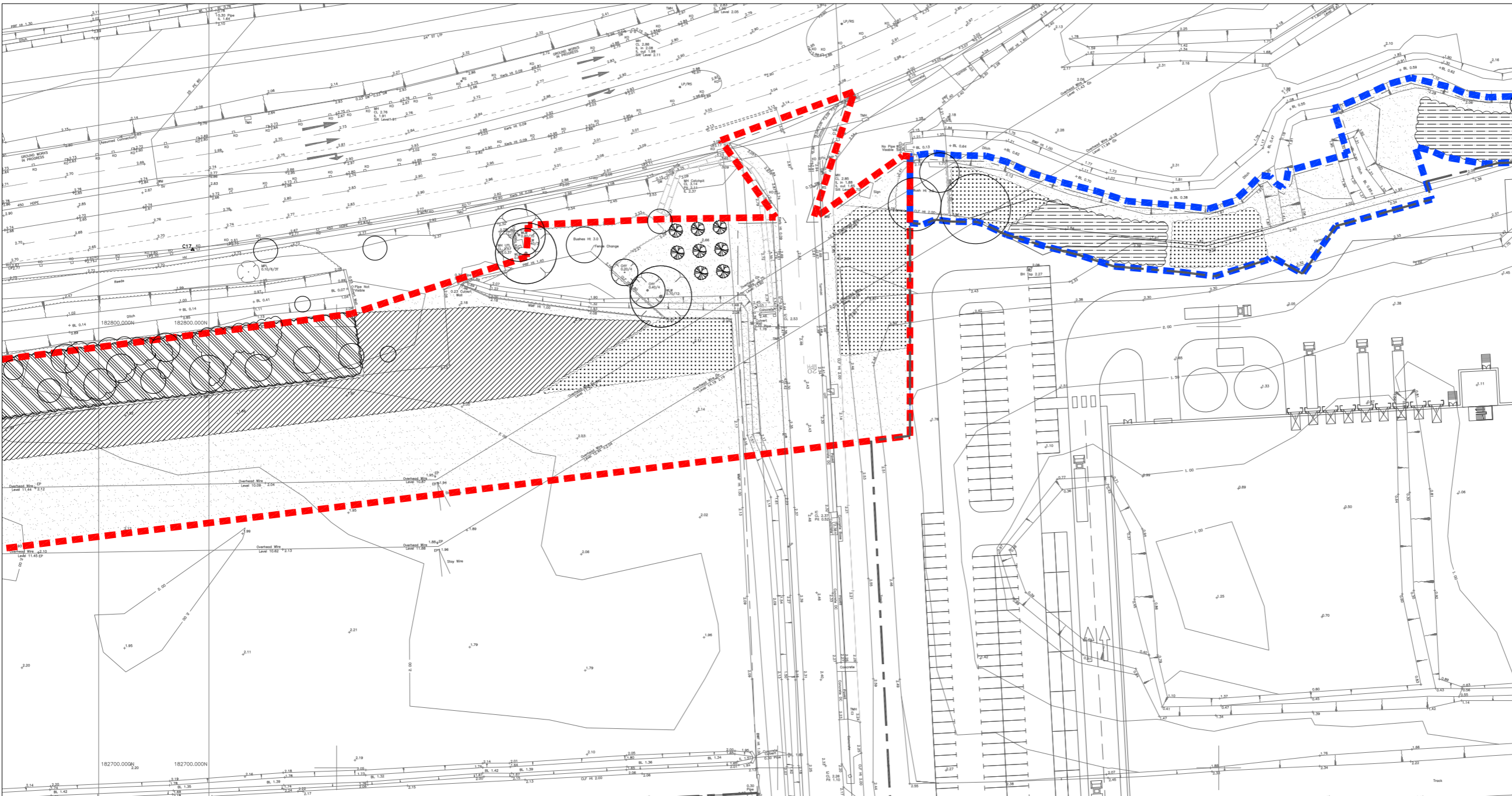
Client  
**DP World (P&O Estates)**  
 Project  
**London Gateway**  
 Drawing Title  
**London Gateway Zone 1A & 1B Planting Proposals**  
 Drawing Status  
**For Planning**  
 Scale: 1:500@A1 Date: 25.09.07 Drawn: PD  
 Drawing No. 04 4901 04 002E IR Checked: Approved  
 04 4901 04 002E IR IR

LAND PLANNING BY DESIGN  
  
 Derek Lovejoy Birmingham Ltd  
 Caxton House 1 Fore Street Birmingham B2 5ER  
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 BIRMINGHAM LONDON



# Appendix 3: Structural Landscape Plans

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## LEGEND

- Zone 1A - Variable Structural Landscape Zone
- Zone 1B - Fixed Structural Landscape Zone

## General

- Section Line
- Existing Vegetation (to be retained)
  - Woodland / Scrub
  - Individual Trees
  - Grassland

## Proposed Planting

- Individual Specimen Trees (species to be as listed in planting schedule)
- Woodland Matrix 1 - Infill to Existing Planting
- Woodland Matrix 1 - Proposed New Planting
- Woodland Matrix 2 - Proposed New Planting
- Understorey Matrix - Infill to Existing Planting
- Understorey Matrix - Proposed New Planting

## Proposed Ecology

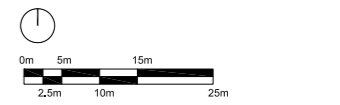
- Proposed refugia / hibernacula to be constructed in accordance with ecologists recommendations

## Existing Infrastructure (to be retained)

- Roads / Highways
- Pylons

## Levels / Contours

- Existing Contours
- Existing Spot Level
- Existing Slopes / Ditches
- Proposed Spot Levels
- Proposed Slopes / Gradients



Rev	Date	By	Notes
E	20.02.2013	PD	Inclusion of LDO Master Plan
D	15.02.2013	PD	Annotations amended following client comments
C	29.04.08	PD	Locations of existing vegetation added
B	14.01.08	PD	Woodland Planting Mix 1 amended in response to comments from planners
A	09.11.07	PD	Pipeline easements for planting areas increased to 6m and service easements removed from drawing

### PLANTING SCHEDULE

**Extra Heavy Standard Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

14-16cm girth  
4.25-5.0m height  
1.8-2.1m clear stem

**Feathered Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

1.75-2.0m height 2x transplanted  
Well furnished with lateral shoots to base  
Rootballed

#### Proposed Woodland Planting Mix 1 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size
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40	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Salix alba*	White willow	400-600mm 3L Contalherised
10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
5	Salix cicherea	Sallow	400-600mm 1+1 Bagged
10	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
Species are to be as listed above for transplant trees.

#### Proposed Woodland Planting Mix 2 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size
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5	Prunus avium*	Wild Cherry	400-600mm 1+1 Bagged
5	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
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#### Proposed Understorey Shrub Planting Mix (refer to planting matrix drawing 2)

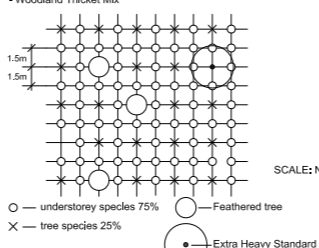
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5	Salix caprea	Goat Willow	400-600mm 1+1 Bagged
5	Salix cicherea	Sallow	400-600mm 1+1 Bagged
15	Rosa canina	Dog rose	400-600mm 1+1 Bagged

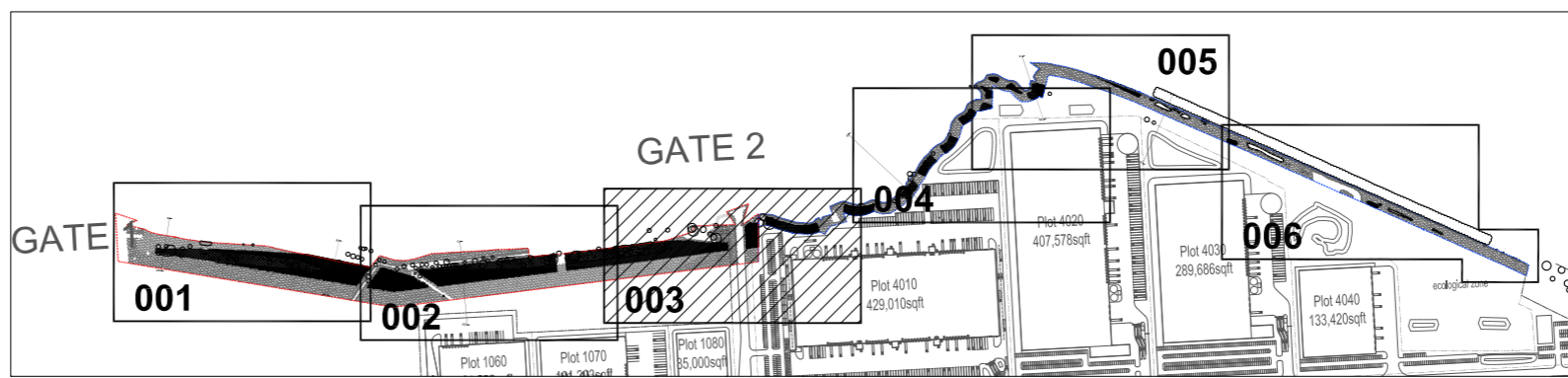
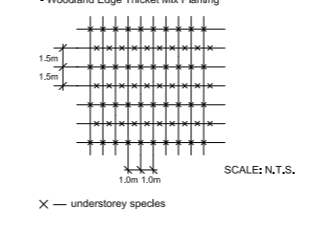
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#### Planting Matrix Drawing 1 - Woodland Thicket Mix



#### Planting Matrix Drawing 2 - Woodland Edge Thicket Mix Planting



Client  
**DP World (P&O Estates)**

Project  
**London Gateway**

Drawing Title  
**London Gateway Zone 1A & 1B Planting Proposals**

Drawing Status  
**For Planning**

Scale: **1:500@A1** Date: **25.09.07** Drawn: **PD**

Drawing No. **04 4901 04 003E IR** Checked: **IR** Approved: **IR**

LAND PLANNING BY DESIGN **LOVEJOY**

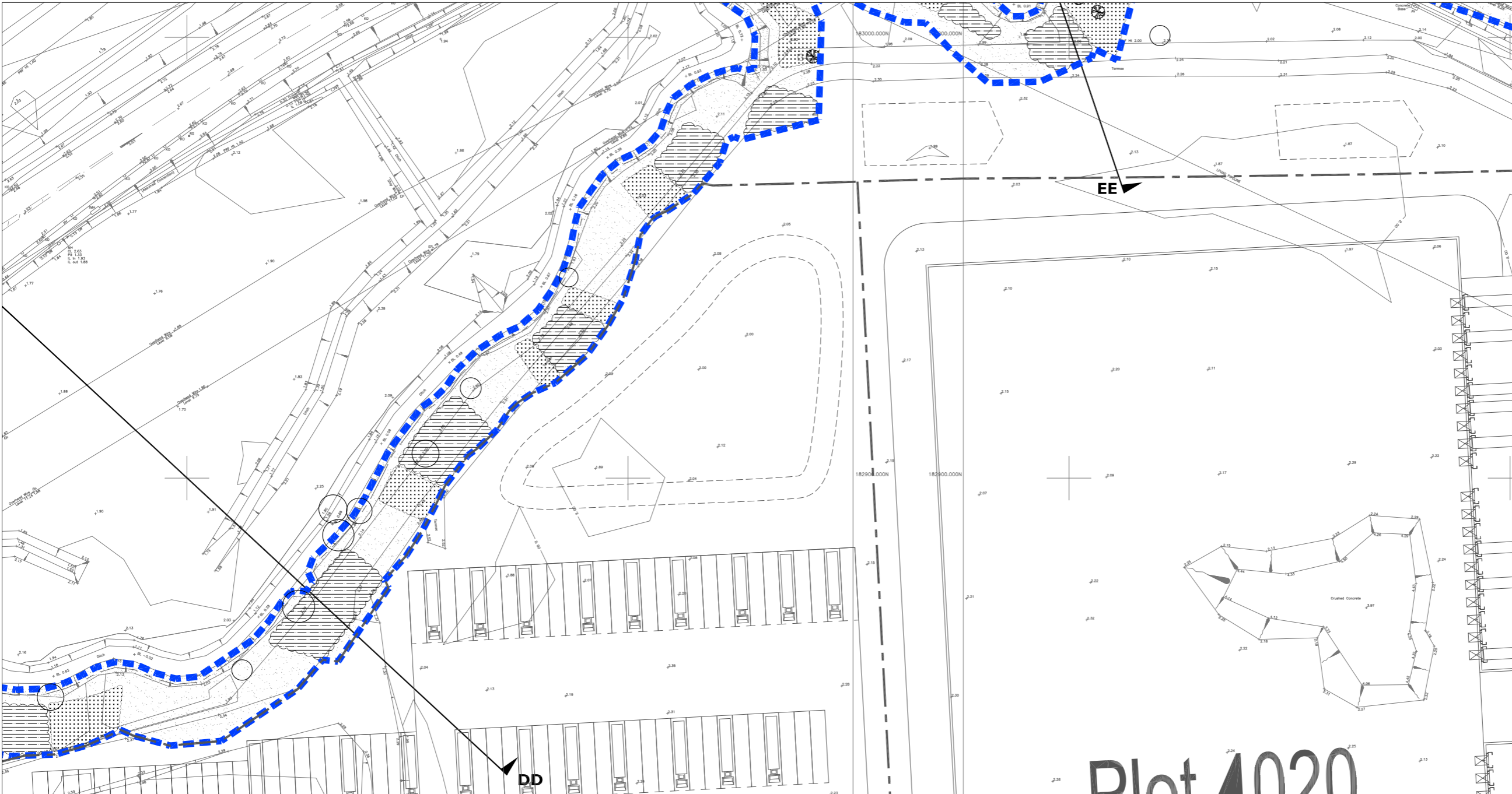
Derek Lovejoy Birmingham Ltd  
Caxton House 1 Fore Street Birmingham B2 5ER  
Tel +44(0) 121 329 7676 Fax +44(0) 121 329 7677  
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**BIRMINGHAM LONDON**



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- Boundaries**
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## General

- Section Line**
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- Woodland Matrix 2 - Proposed New Planting
- Understorey Matrix - Infill to Existing Planting
- Understorey Matrix - Proposed New Planting

## Proposed Ecology

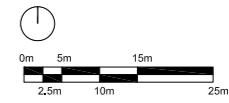
- Proposed refugia / hibernacula to be constructed in accordance with ecologists recommendations

## Existing Infrastructure (to be retained)

- Roads / Highways
- Pylons

## Levels / Contours

- Existing Contours
- Existing Spot Level
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### PLANTING SCHEDULE

**Extra Heavy Standard Trees**  
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Well furnished with lateral shoots to base  
Rootballed

### Proposed Woodland Planting Mix 1 (refer to planting matrix drawing 1)

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10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
10	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
Species are to be as listed above for transplant trees.

### Proposed Woodland Planting Mix 2 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

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**Feathered Trees (1.75-2.0m high)**  
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### Proposed Understorey Shrub Planting Mix (refer to planting matrix drawing 2)

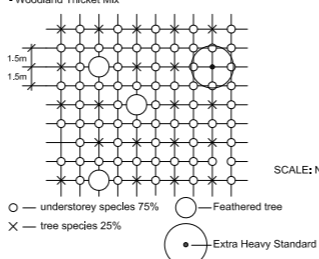
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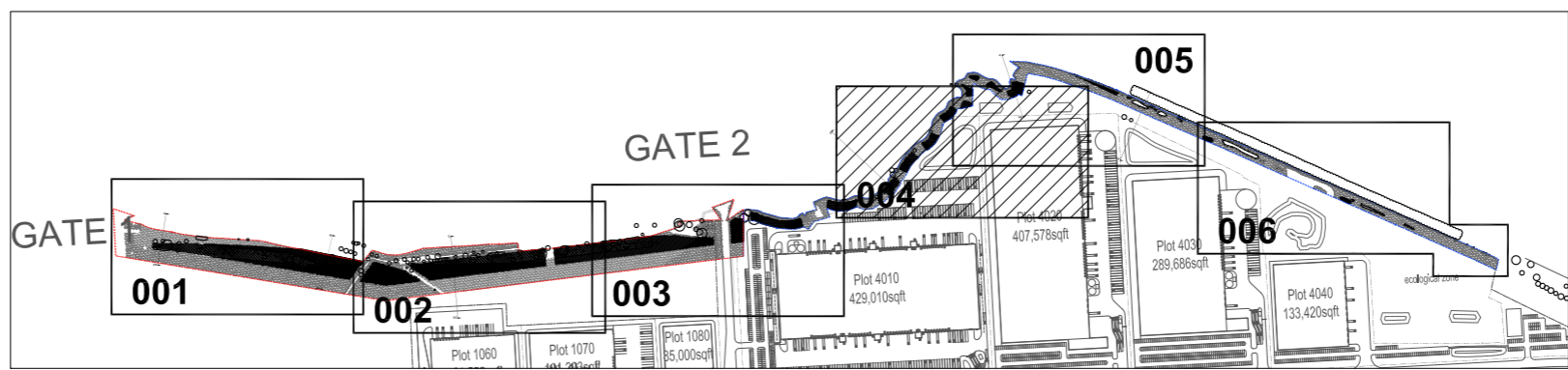
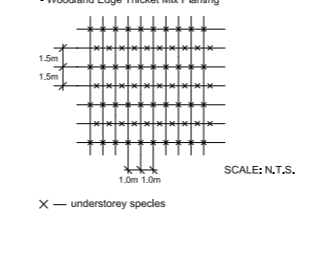
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### Planting Matrix Drawing 2 - Woodland Edge Thicket Mix Planting



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Drawing Title  
**London Gateway Zone 1A & 1B Planting Proposals**

For Planning

Scale	Date	Drawn
1:500@A1	25.09.07	PD

Drawing No.	Checked	Approved
04 4901 04 004E IR	IR	IR

LAND PLANNING BY DESIGN

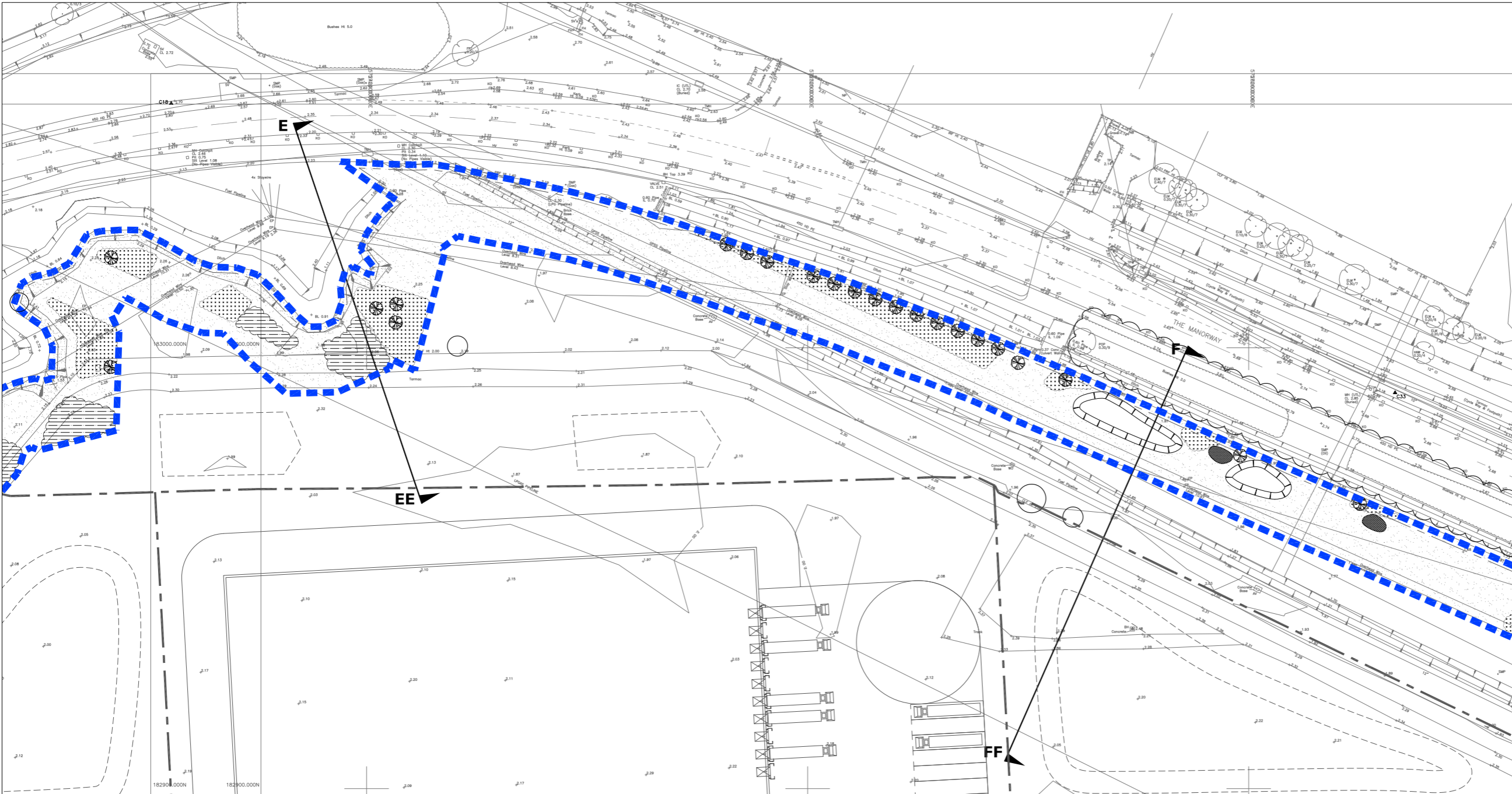
Derek Lovejoy Birmingham Ltd  
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Tel +44(0) 121 329 7676 Fax +44(0) 121 329 7677  
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  - Zone 1B - Fixed Structural Landscape Zone

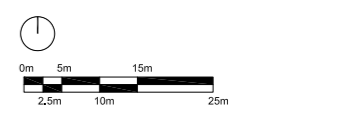
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10	<i>Salix cicherea</i>	Sallow	400-600mm 1+1 Bagged
5	<i>Quercus robur*</i>	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
Species are to be as listed above for transplant trees.

### Proposed Woodland Planting Mix 2 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

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10	<i>Salix caprea</i>	Goat willow	400-600mm 1+1 Bagged
5	<i>Salix cicherea</i>	Sallow	400-600mm 1+1 Bagged
5	<i>Prunus avium*</i>	Wild Cherry	400-600mm 1+1 Bagged
5	<i>Prunus spinosa</i>	Blackthorn	400-600mm 1+1 Bagged
5	<i>Quercus robur*</i>	Pedunculate Oak	400-600mm 1+1 Bagged

**Feathered Trees (1.75-2.0m high)**  
Species are to be as listed above for transplant trees.

### Proposed Understorey Shrub Planting Mix (refer to planting matrix drawing 2)

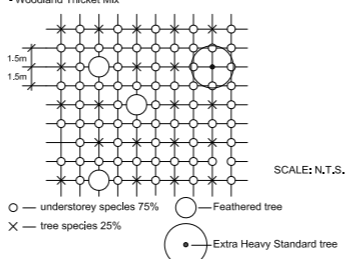
Transplants planted in groups of 7-15 of the same species on a 1.0m grid. Rows parallel to the Manorway are to be 1.5m apart to allow adequate maintenance access.

%	Species	Common Name	Supply size
5	<i>Cornus sanguinea</i>	Dogwood	400-600mm 1+1 Bagged
50	<i>Crataegus monogyna</i>	Hawthorn	400-600mm 1+1 Bagged
5	<i>Ilex aquifolium</i>	Holly	400-600mm 3L Contalherised
15	<i>Prunus spinosa</i>	Blackthorn	400-600mm 1+1 Bagged
5	<i>Salix caprea</i>	Goat Willow	400-600mm 1+1 Bagged
5	<i>Salix cicherea</i>	Sallow	400-600mm 1+1 Bagged
15	<i>Rosa canina</i>	Dog rose	400-600mm 1+1 Bagged

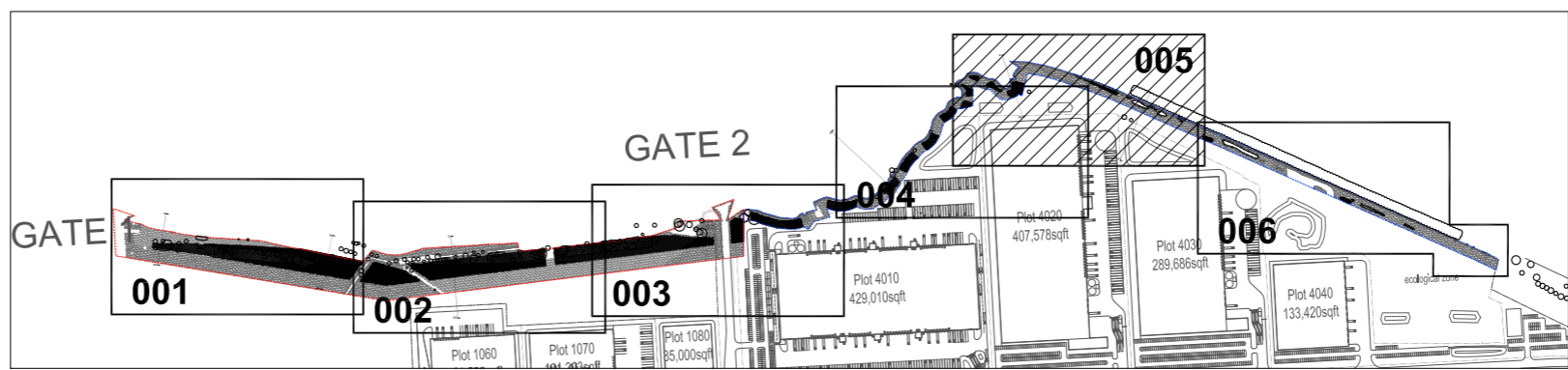
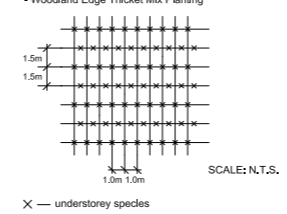
**Marginal Aquatic Planting to Proposed Scrapes**  
Scrapes to have gently sloping banks to allow colonisation by marginal aquatic species. Sediment and selected vegetation to be translocated from adjacent pools in accordance with ecologists recommendations.

**Note:**  
All trees and shrub species to be of native provenance where possible.

### Planting Matrix Drawing 1 - Woodland Thicket Mix



### Planting Matrix Drawing 2 - Woodland Edge Thicket Mix Planting



Client  
**DP World (P&O Estates)**

Project  
**London Gateway**

Drawing Title  
**London Gateway Zone 1A & 1B Planting Proposals**

Drawing Status  
**For Planning**

Scale: **1:500@A1** Date: **25.09.07** Drawn: **PD**

Drawing No. **04 4901 04 005E IR** Checked: **IR** Approved: **IR**

LAND PLANNING BY DESIGN

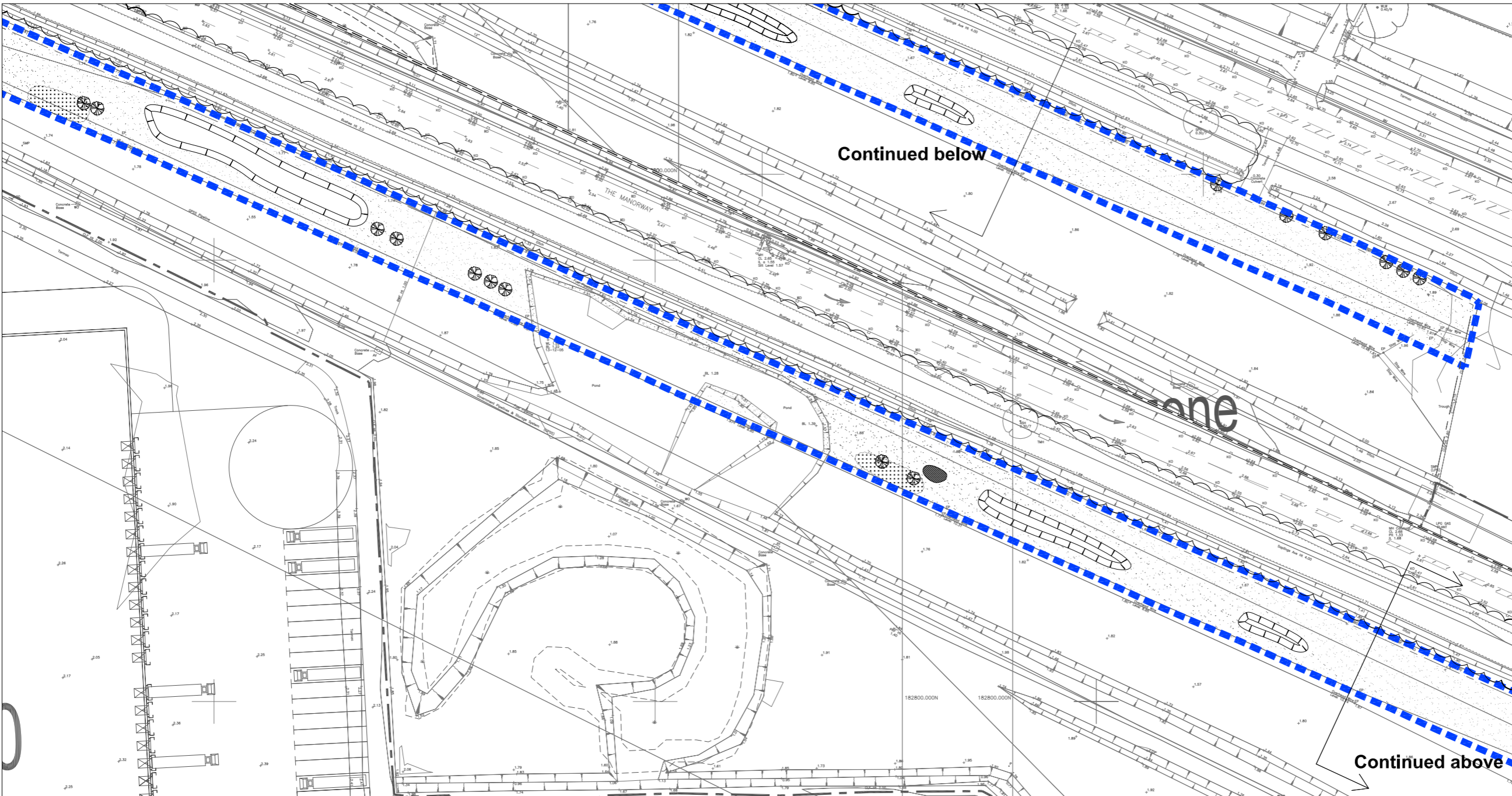
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BIRMINGHAM LONDON



# Appendix 3: Structural Landscape Plans

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- LEGEND**
- Boundaries**
- Zone 1A - Variable Structural Landscape Zone
  - Zone 1B - Fixed Structural Landscape Zone

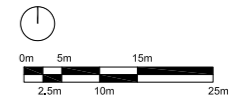
- General**
- Section Line
- Existing Vegetation (to be retained)**
- Woodland / Scrub
  - Individual Trees
  - Grassland

- Proposed Planting**
- Individual Specimen Trees (species to be as listed in planting schedule)
  - Woodland Matrix 1 - Infill to Existing Planting
  - Woodland Matrix 1 - Proposed New Planting
  - Woodland Matrix 2 - Proposed New Planting
  - Understorey Matrix - Infill to Existing Planting
  - Understorey Matrix - Proposed New Planting

- Proposed Ecology**
- Proposed refugia / hibernacula to be constructed in accordance with ecologists recommendations

- Existing Infrastructure (to be retained)**
- Roads / Highways
  - Pylons

- Levels / Contours**
- Existing Contours
  - Existing Spot Level
  - Existing Slopes / Ditches
  - Proposed Spot Levels
  - Proposed Slopes / Gradients



Rev	Date	By	Notes
E	20.02.2013	PD	Inclusion of LDO Master Plan
D	15.02.2013	PD	Annotations amended following client comments
C	29.04.08	PD	Locations of existing vegetation added
B	14.01.08	PD	Woodland Planting Mix 1 amended in response to comments from planners.
A	09.11.07	PD	Pipeline easements for planting areas increased to 6m and service easements removed from drawing

## PLANTING SCHEDULE

**Extra Heavy Standard Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

14-16cm girth  
4.25-5.0m height  
1.8-2.1m clear stem

**Feathered Trees**  
Individual trees planted in single species groups of 3-5 trees within woodland mixes below. Species to be as listed for Woodland Mix planting below

1.75-2.0m height 2x transplanted  
Well furnished with lateral shoots to base  
Rootballed

### Proposed Woodland Planting Mix 1 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size
5	Carpinus betulus*	Hornbeam	400-600mm 1+1 Bagged
15	Corylus avellana	Hazel	400-600mm 1+1 Bagged
5	Populus nigra var. betulaefolia	Black Poplar	400-600mm 1+1 Bagged
40	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Ilex aquifolium	Holly	400-600mm 3L Contalherised
10	Salix alba*	White willow	400-600mm 1+1 Bagged
10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
10	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

### Feathered Trees (1.75-2.0m high)

Species are to be as listed above for transplant trees.

### Proposed Woodland Planting Mix 2 (refer to planting matrix drawing 1)

Tree species\* to comprise 75% Transplants and 25% Feathered trees planted in single species groups of 3-5 at 3m apart and 3m from Extra Heavy Standard trees. Shrubs to be planted in groups of 7-15 of the same species on a 1.5m grid.

%	Species	Common Name	Supply size
5	Acer campestre*	Field Maple	400-600mm 1+1 Bagged
10	Alnus glutinosa*	Alder	400-600mm 1+1 Bagged
10	Corylus avellana	Hazel	400-600mm 1+1 Bagged
40	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Salix alba*	White willow	400-600mm 1+1 Bagged
10	Salix caprea	Goat willow	400-600mm 1+1 Bagged
5	Salix chereia	Sallow	400-600mm 1+1 Bagged
5	Prunus avium*	Wild Cherry	400-600mm 1+1 Bagged
5	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Quercus robur*	Pedunculate Oak	400-600mm 1+1 Bagged

### Feathered Trees (1.75-2.0m high)

Species are to be as listed above for transplant trees.

### Proposed Understorey Shrub Planting Mix (refer to planting matrix drawing 2)

Transplants planted in groups of 7-15 of the same species on a 1.0m grid. Rows parallel to the Manorway are to be 1.5m apart to allow adequate maintenance access.

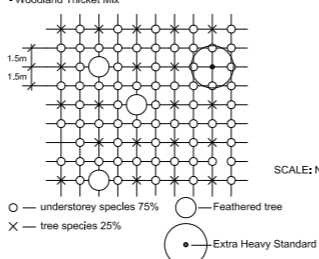
%	Species	Common Name	Supply size
5	Cornus sanguinea	Dogwood	400-600mm 1+1 Bagged
50	Crataegus monogyna	Hawthorn	400-600mm 1+1 Bagged
5	Ilex aquifolium	Holly	400-600mm 3L Contalherised
15	Prunus spinosa	Blackthorn	400-600mm 1+1 Bagged
5	Salix caprea	Goat Willow	400-600mm 1+1 Bagged
5	Salix chereia	Sallow	400-600mm 1+1 Bagged
15	Rosa canina	Dog rose	400-600mm 1+1 Bagged

### Marginal Aquatic Planting to Proposed Scrapes

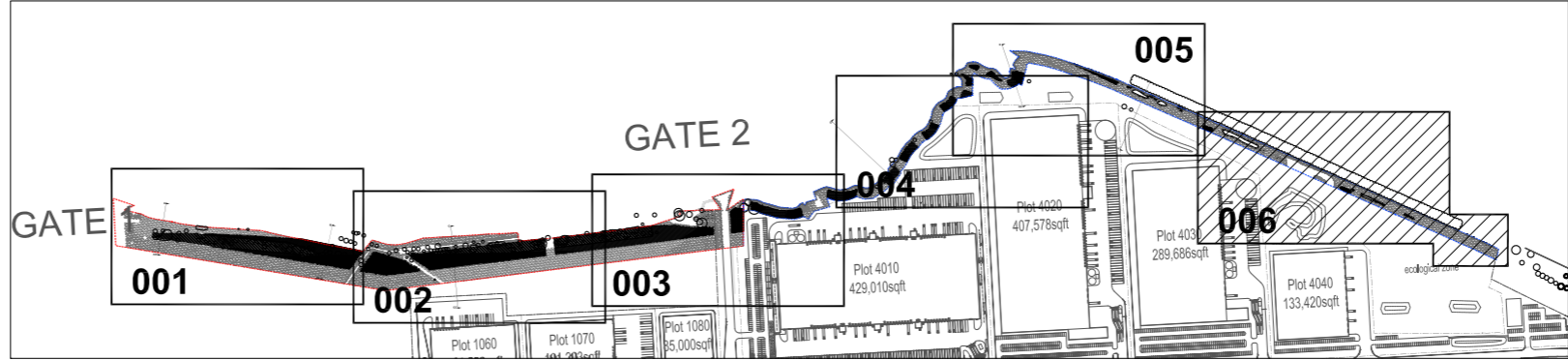
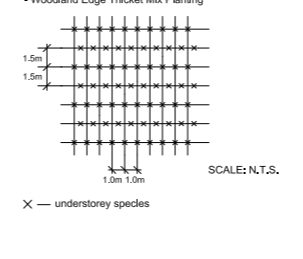
Scrapes to have gently sloping banks to allow colonisation by marginal aquatic species. Sediment and selected vegetation to be translocated from adjacent pools in accordance with ecologists recommendations.

**Note:**  
All trees and shrub species to be of native provenance where possible.

### Planting Matrix Drawing 1 - Woodland Thicket Mix



### Planting Matrix Drawing 2 - Woodland Edge Thicket Mix Planting



Client  
**DP World (P&O Estates)**

Project  
**London Gateway**

Drawing Title  
**London Gateway Zone 1A & 1B Planting Proposals**

Drawing Status  
**For Planning**

Scale  
**1:500@A1**

Date  
**25.09.07**

Drawn  
**PD**

Drawing No.  
**04 4901 04 006E IR**

Checked  
**IR**

Approved  
**IR**

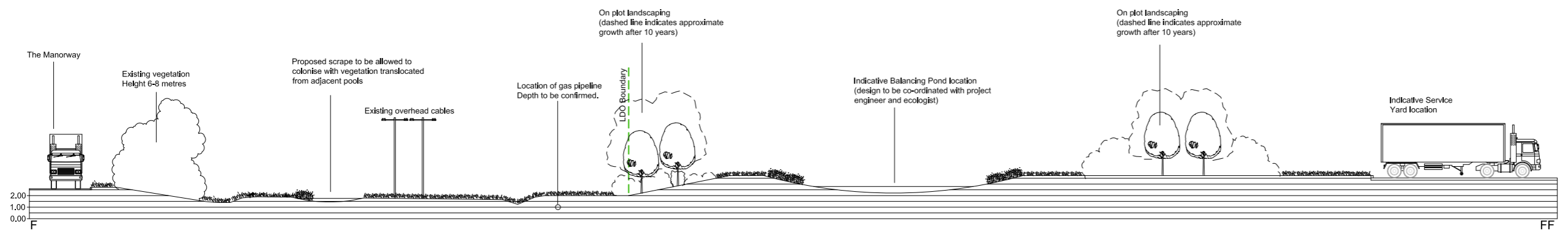
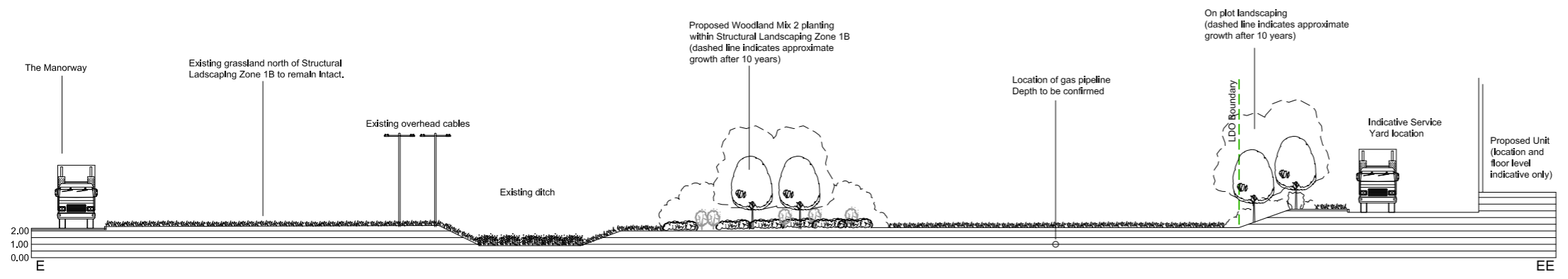
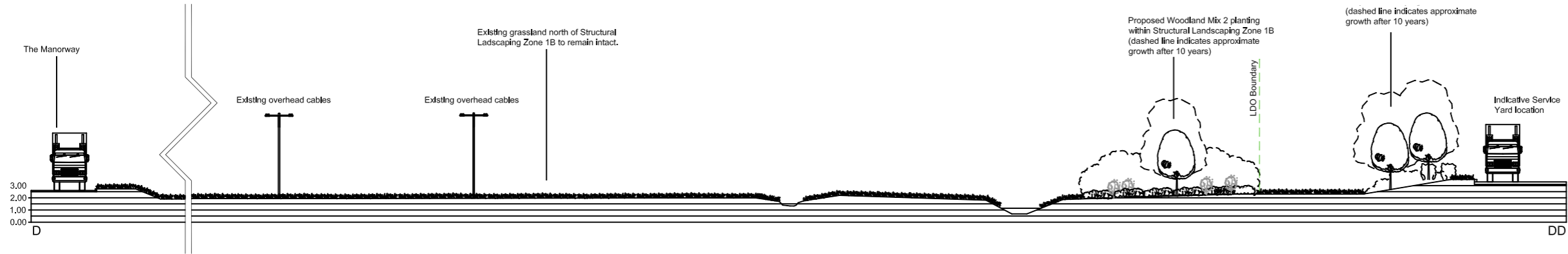
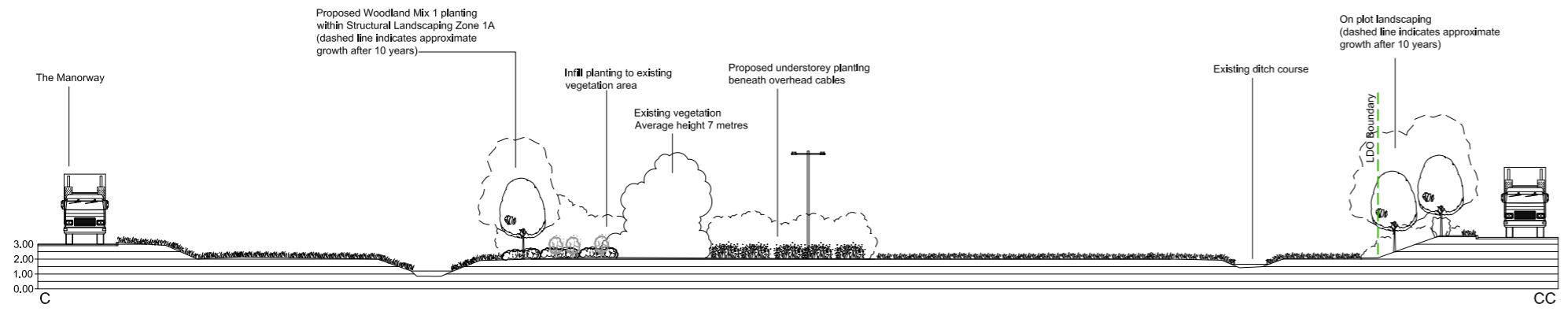
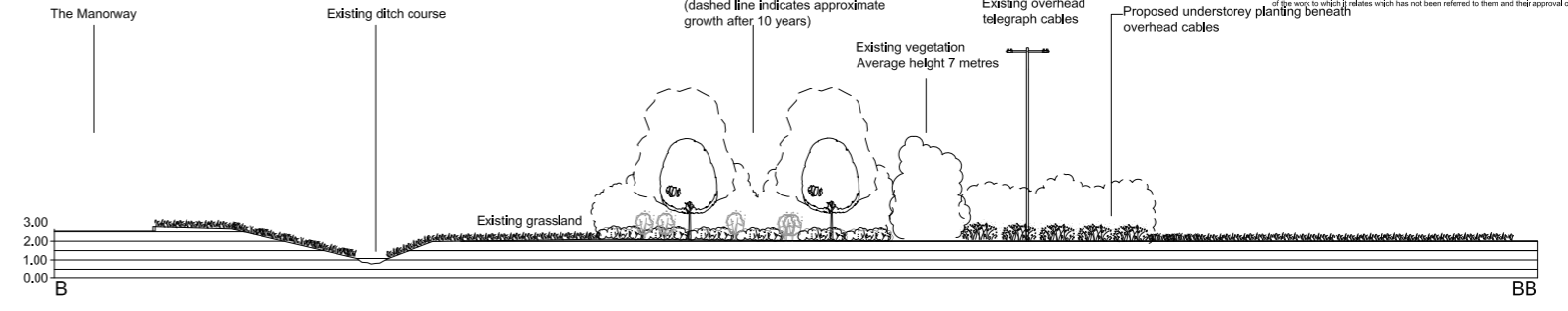
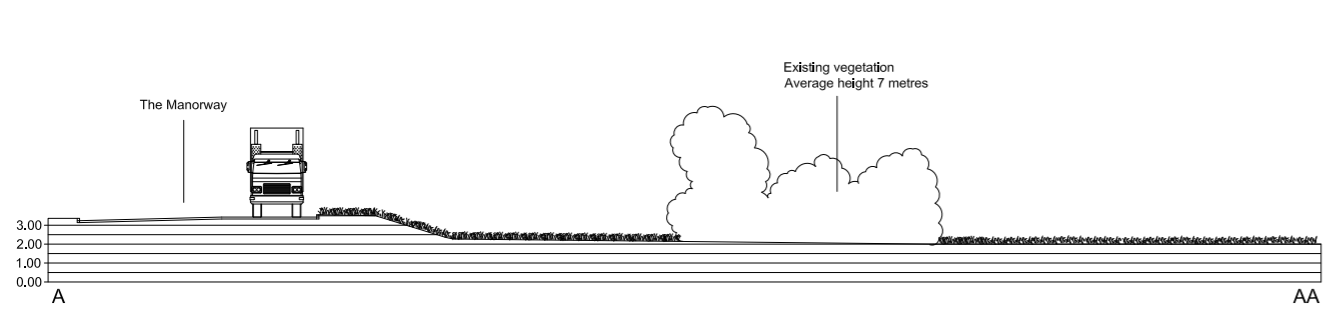
LAND PLANNING BY DESIGN

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enquiries@lovejoybirmingham.uk.com www.lovejoy.uk.com

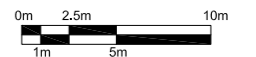
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# Appendix 3: Structural Landscape Plans

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**Note:**  
All existing vegetation shown, outside the easements of underlying services, shall be supplemented with additional screening planting. Please refer to Lovejoy Drawings 04 4901 04 001-006 for details. A detailed survey of planting locations within the existing planting shall be carried out on site prior to the landscape works being undertaken.



D	20.02.2013	PD	Sections amended to reflect LDO master plan
C	15.02.2013	PD	Sections amended following client comments
B	14.01.08	PD	Sections amended to incorporate revised service easements
A	09.11.07	PD	Sections extended in response to comments from planners

Rev | Date | By | Notes

Client  
**DP World (P&O Estates)**

Project  
**London Gateway**

Drawing Title  
**Structural Landscape Zone Indicative Sections**

Drawing Status  
**For Planning**

Scale	Date	Drawn
1:200@A1	25.09.07	PD
Drawing No.	Checked	Approved
04 4901 04 007D IR		IR



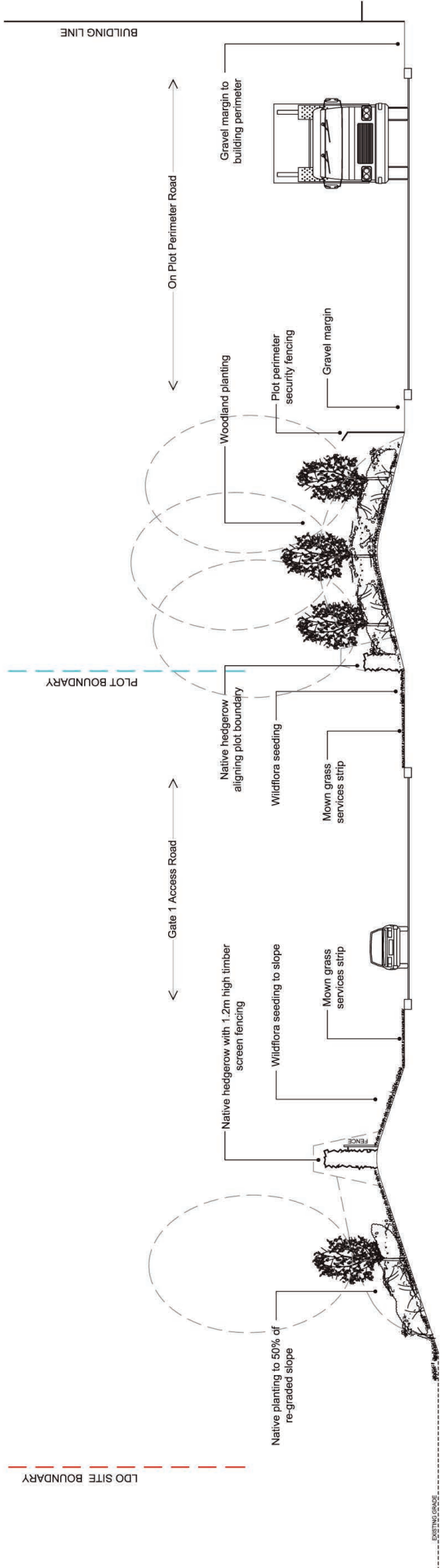
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BIRMINGHAM LONDON

Appendix 4:  
Structural Landscape Plan (West)







LDO SITE BOUNDARY

PLOT BOUNDARY

BUILDING LINE

Gate 1 Access Road

On Plot Perimeter Road

Native hedgerow with 1.2m high timber screen fencing

Native hedgerow aligning plot boundary

Woodland planting

Native planting to 50% of re-graded slope

Wildflora seeding to slope

Wildflora seeding

Mown grass services strip

Mown grass services strip

Plot perimeter security fencing

Gravel margin

Gravel margin to building perimeter

EXISTING GRADE

FENCE



Appendix 5:  
Terms of Reference for London Gateway  
Services Limited





## Appendix 5

### **Terms of Reference for London Gateway Services Limited**

#### **Management Principles**

The principle management aims of London Gateway Services Limited (LGSL) are to:

- achieve and consistently deliver a level of service and environment to occupiers that reflects a high quality value driven ethos;
- embrace the values of sustainable practices, relating to the environment, commercial objectives, social responsibilities, and the essential well-being of all personnel;
- maintain all elements for the long term benefit of the occupiers and their customers;
- seek continual improvement in the provision of services and management disciplines, bringing benefits to occupiers through the Park's adjacency to London Gateway port;
- achieve a secure, safe and world class logistics facility that enjoys long term success.

#### **Management Details**

The logistics park Estate will be managed in two principal zones, recognising the development programme and the sharing of certain services and infrastructure facilities. In addition, a third zone will be formed by the private Main Access Road owned by the London Gateway Port Limited.

LGSL will employ managers, facility personnel and administration staff directly, with all services and supplies procured through a strict contract regime that mirrors the corporate disciplines of DP World.

Principle areas of management activity will encompass:

- Park wide occupier engagement, promoting appropriate park community activities, key stakeholder engagement, and providing an estate management forum;
- Company administration, asset management, financial accounting and budgets, and sinking fund management;
- Utility supplies and distribution;
- Water management and drainage;
- Waste and recycling;
- Community networked building and services management system integration and monitoring;
- Landscape and physical environment management;
- Security; hard, observation and preventative regimes;
- Regulatory and statutory compliance, including health and safety;
- Communications and IT, infrastructure and park community network;
- General fabric maintenance and repairs and planned lifecycle maintenance regimes;
- Traffic management, wayfinding and intelligent mapping, travel plan support and co-ordination;
- Specialist services as required.

The LGSL management team recognises the value and quality ambitions of the London Gateway Logistics Park. The team will embrace best practice approach, with the objective to achieve a world class ethos through its provision and co-ordination of management routines and practices.