

5.12 Tree strategy

The emerging schemes comprises 71 proposed trees. The trees have been carefully located and selected with consideration to aspect, location, character aesthetic, and seasonality.

The specimens will eventually mature to form green corridors along the riverfront and streets, creating nesting and foraging opportunities for birds, bats and insects.

Pinus sylvestris and Salix alba are generally confined to the riverfront, with street trees lining the mews street, creating a green corridor that links to the existing River Crane green / blue corridor.

The trees are a mixture of native and non-native species, which have been developed with the ecology consultant, Richard Grave Associates.

There are also a number of feature trees, including pines, which will provide year-round colour.

Biosecurity & climate resilience

Biosecurity and a changing climate is an emerging threat to ecosystem resilience, with new regulations and guidelines continuously being developed in response to pests, pathogens, and climate change.

Native species are still vitally important in developments but the current threat means some of or native species are being exposed to hotter, warmer summers as well as prolonged periods of drought and wet - species that are unable to adapt are being lost.

These variable conditions however present an opportunity to consider alternative species that are adaptable to the changing British climate. This may include native species, but also non invasive species from the continent or further abroad.

Following feedback from the Local Planning Authority we have reviewed the tree strategy to include trees that;

- Improve biodiversity
- Larger canopies
- Successional growth
- Suitable for the ecological river front
- Suitable for car park
- Suitable for street planting



Plan indicating trees strategy



Pinus sylvestris



Salix alba



Acer campestre



Corylus colurna



Alnus x spaethii



Pyrus calleryana 'Chanticleer'



Sorbus aucuparia



Tilia platyphyllos






















Ulmus 'Dodoens'



Acer platanoides 'Cleveland'


5.12.1 Tree strategy - schedule

Quantity	Botanical name	Common name	Girth (cm)	Root zone	Installation height (cm)	Mature height / spread (m)	Canopy spread (m)	Specification	Native / non-native
3	 Pinus sylvestris	Scots Pine	n/a	RB	300-350	21	8	Leader with laterals; feathered to base; clear stem 150cm	Native
2	 Salix alba*	White Willow	14-16	RB	400-450	15	10	Extra heavy standard, clear stem 175-200cm	Native
7	 Acer campestre	Common Maple	10-12	RB	300-350	15	7	Standard, clear stem 200cm, four breaks	Native
7	 Pyrus calleryana 'Chanticleer'	Ornamental Pear	14-16	RB	400-450	17	4	Extra heavy standard, clear stem 175-200cm	Non-native
8	 Sorbus aucuparia	Mountain Ash	12-14	45-85L	350-425	7	4	Heavy standard, clear stem 175-200cm, five breaks	Non-native
5	 Betula pendula	Silver Birch	14-16	RB	400-450	10	5	Extra heavy standard, clear stem 175-200cm, five breaks	Non-native
3	 Amelanchier	Shadbush		RB	200-250			Multi stem, three bushy; five stems minimum	Non-native
3	 Amelanchier lamarcki	June Berry	12-14	RB	300-350	8	3	3x; Heavy Standard; clear stem 175-200cm; 5 breaks	Non-native
4	 Corylus colurna	Turkish Hazel	18-20	RB	450-500	8	6	3x; Extra Heavy Standard; clear stem minimum 200cm	Non-native
5	 Ulmus 'Dodoens'	Elm 'Dodoens'	14-16	RB	400-450	14	10	3x; Extra Heavy Standard; clear stem 175-200cm; 5 breaks	Non-native
5	 Alnus x spaethii	Alder	16-18	RB	400-450	15	8	3x; Extra Heavy Standard; clear stem minimum 200cm	Non-native
4	 Acer platanoides 'Cleveland'	Norway Maple 'Cleveland'	12-14	RB	350-425	12	6	3x; Heavy Standard; clear stem minimum 200cm; 5 breaks	Non-native
3	 Malus sylvestris	Crab apple	12-14	RB	350-425	8	4	3x; Heavy Standard; clear stem 175-200cm; 5 breaks	Native
4	 Euonymus europaeus	Spindle	n/a	10L	80-100	3	3	Branched; 6 breaks	Native
5	 Tilia Platyphyllos	Broad leaved lime	10-12	RB	300-350	30	20	2x; Selected Standard; clear stem 175-200cm; 4 breaks	Native
2	 Alnus glutinosa	Common alder	12-14	RB	350-425	15	8	3x; Large Feathered	Native


RB Rootball
 B Bare rooted and bagged
 Riverfront trees
 Street trees
 Car park trees

* Height and spread of Salix alba species to be maintained by a qualified arboriculturalist / tree surgeon




 Alnus glutinosa




 Malus sylvestris



 Euonymus europaeus



 Betula pendula

5.13 Tree strategy - soil volumes

In coordination with Green Blue Urban, tree pit specialists, we have calculated the required soil volume for each tree, as illustrated on the adjacent table.

The Green Blue Urban, Soil Volume Guide v1.1 provides tree pit and soil volume guidance and gives the recommended volumes for species based on canopy size at 25 years.

Trees in connected pits and softscape areas can share soil volumes and therefore it is common practice to reduce soil volume by upto 20% in such instances. Further detail on extent of tree pits is provided on the enclosed technical drawings.

All topsoils must accord with BS 3882:2007 Specification for topsoil

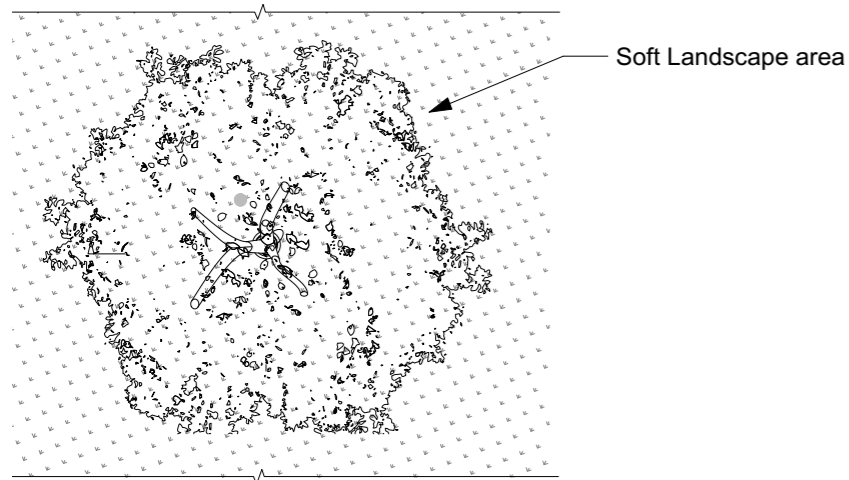
All subsoils must accord with BS 8601:2013 Specification for subsoil

	Botanical name	Required Soil Volume (cubic volume)
	Pinus sylvestris	30 m ³
	Salix alba*	47.1 m ³
	Acer campestre	23 m ³
	Pyrus calleryana 'Chanticleer'	9 m ³
	Sorbus aucuparia	7.5 m ³
	Betula pendula	11 m ³
	Amelanchier	6 m ³
	Amelanchier lamarckii	5.4 m ³
	Corylus colurna	18 m ³
	Ulmus 'Dodoens'	47.1 m ³
	Alnus x spaethii	30.2 m ³
	Acer platanoides 'Cleveland'	17 m ³
	Malus sylvestris	7.5m ³
	Euonymous europaeus	
	Tilia Platyphyllos	188.4 m ³
	Alnus glutinosa	30.2 m ³

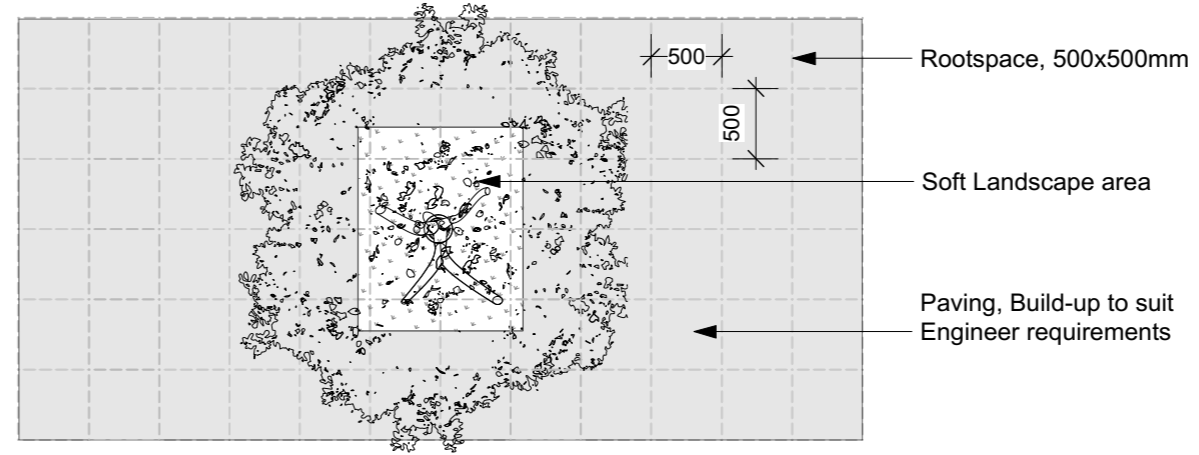
* Soil Volume Calculator provide by GreenBlue Urban website, considering the maximum canopy spread

5.14 Tree Pit details

Tree pit in soft landscaping

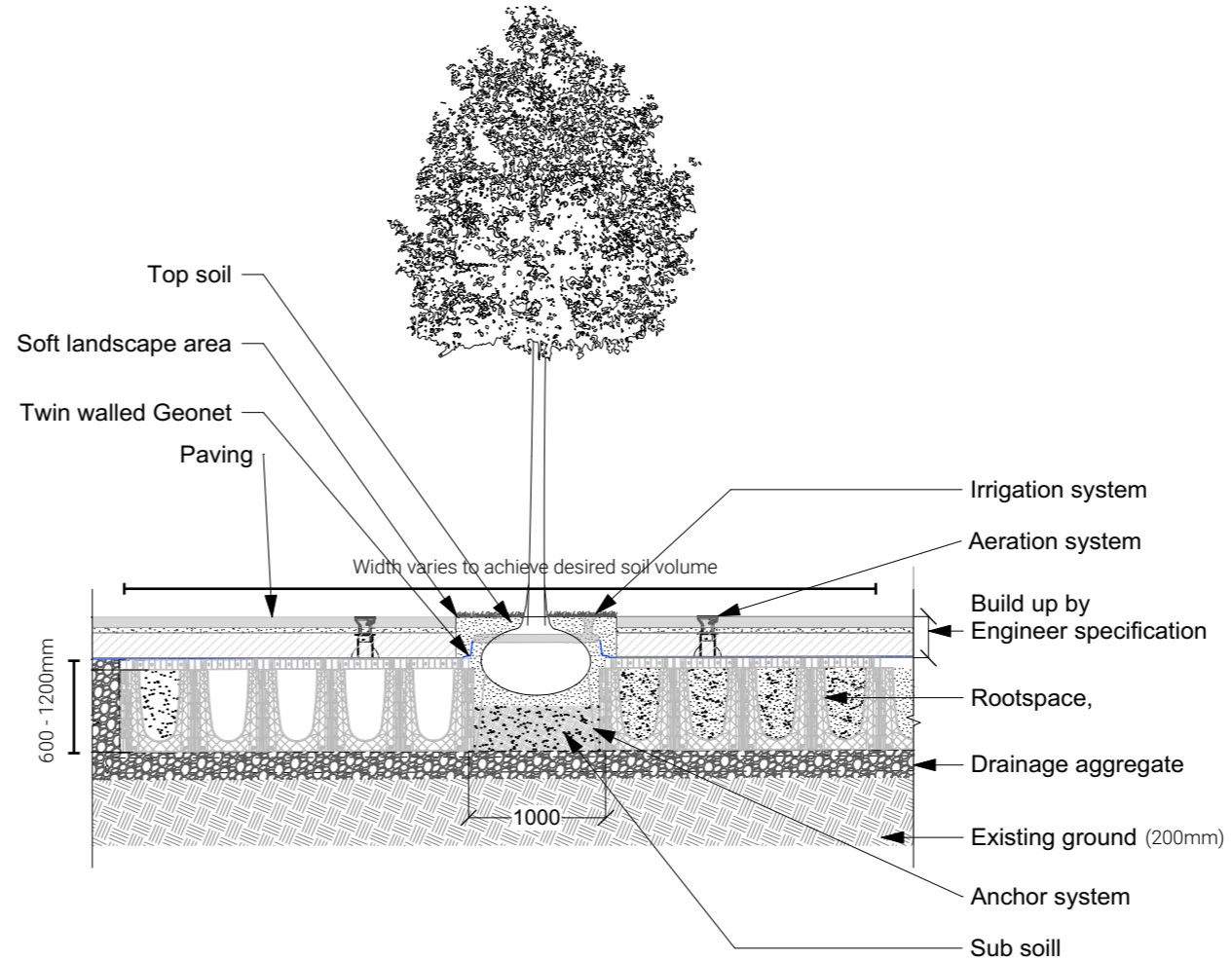
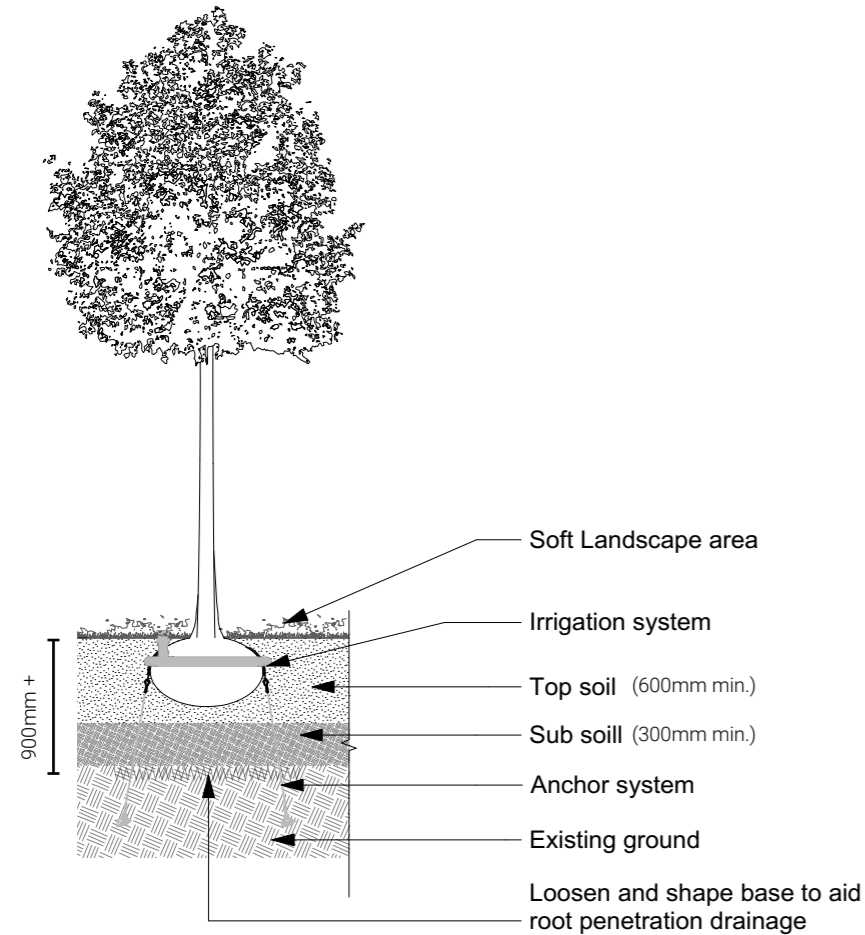


Tree pit in hard landscaping



Notes:

1. Width of rootspace system varies subject to required soil volumes for trees in pits and connected pits
2. Depth of soil volume and rootspace / cellular root grid can vary between 600 & 1200mm to achieve required soil volumes.
3. Refer to soil volume drawings to required soil volumes and extent of tree pit strategy.












5.15 Urban Greening

In line with London Plan Policy G5 Urban Greening and with reference to the Urban Greening Factor for London, the proposal is required to achieve a target score of 0.4 for residential projects and 0.3 for commercial developments. Where developments comprise both residential and commercial, the guidance suggests that the use with the greatest area should take precedence, in this case residential, and therefore the target score is 0.4.

Via an integrated approach to green infrastructure, a number of 'green surface cover' typologies that contribute to the urban greening score have been included. They include new trees, hedgerows, and soft planting beds, intensive and extensive green roofs, and permeable paving systems.

The scheme currently achieves a score of 0.57 and is illustrated on the adjacent diagram.

Urban greening schedule

Key	Surface cover type	Area	Contribution
	Semi natural vegetation	261	261
	Intensive green roof	145	116
	Trees in connected pits	3611	2888
	Standard trees planted in pits	0	
	Extensive green roof with 80mm min. substrate	532	372
	Flower rich perennial planting	440	308
	Hedges	300	180
	Amenity grassland	574	229
	Permeable paving	4832	483
Total			6271
Urban Factor score			0.44



Urban Greening Factor plan

5.16 Biodiversity

In conjunction with Richard Graves Associates, we have designed a plant palette which benefits the local wildlife by providing either a food source for insects or roost potential. Bird and bat boxes are proposed to be attached to larger mature trees.



Example of bat boxes



Example of bird boxes



Example of invertebrate hotel



Example of biodiverse plant palette

5.16.1 Green roof

The green roof is located adjacent to the First Floor terrace and provides storm water management, a habitat for wildlife and contributes to lowering urban air temperature preventing the heat island effect.

Specification: A biodiverse instant green turf system as supplied by Wildflower Turf or similar approved. The roof turf is made up of 41 UK native wildflowers and grasses, with a minimum of 50% wildflowers.

The turf should be used in conjunction with 'Wildflower Roof Substrate'. It has been developed to support plant growth whilst free-draining and is lightweight.



Green roof diagram

Key
 Biodiverse green roofs

5.16.3 Habitat creation

The diagram below illustrates the proposed locations for bird and bat boxes within the landscape and public realm. All bird / bat boxes located on the site should be coordinated between the architect and ecologist.



Habitat strategy diagram

Key
 ● Bird boxes
 ● Bat boxes
 ● Hibernaculum / insect tower

*For bird / bat boxes in proposed buildings refer to ecology and architect drawings / reports.

5.16.2 SuDS Strategy

The SuDS strategy has been developed to manage water quality and quantity on site.

A number of SuDS systems have been included to help manage water run off on site. This includes new tree planting, new softscaped areas such as lawns and shrub beds, green roofs, and permeable paving systems.



SuDS strategy diagram

Key
 Soft planting beds
 Permeable paving

5.16.4 Summary

Using the biodiversity metric, the ecologist has calculated a 100% net gain for habitat units and a 100% net gain for hedgerow units.

The scheme delivers 100% biodiversity net gain, well above the 10% target.

For a detailed breakdown of the Biodiversity Net Gain Report, Greggs, Twickenham Industrial Oct 22 Issued V0.4, prepared by Richard Graves Associates

5.17 Green roof specification

A biodiverse extensive green roofs is specified where possible across the scheme, namely Building F, and are co-located with PV / solar panels (where possible) using a 'biosolar' approach.

A minimum of 100mm lightweight growing substrate is required alongside a system, such as Bauder's Flora 3 system (refer to adjacent image), to ensure that plants are appropriate and meet the ecological objectives of the scheme.

The Bauder Flora 3 seed mix includes 65% perennial wildflowers, 20% annuals and 15% grasses.



Bauder Flora 3 Seed mix example



Bauder Flora 3 Seed mix example

BAUDER FLORA 3 SEED MIX

Establishment and Growth

Typically the mix will produce flowers from April to October starting with species Wild Strawberry and Cowslip, through the summer with Yarrow and Black Knapweed with Lady's Bedstraw flowering later into the autumn. The annuals, biennials and grasses will provide cover and colour in the first season allowing time for the slower growing perennials to establish in later years. The mix has been specified to be drought tolerant with sedum species and low growing perennials.

BioSOLAR

Plants are chosen that do not exceed 40 cm in height to avoid problems with shading of solar panels when the vegetation is used in conjunction with Bauder BioSOLAR. Shade tolerant ground cover plants were specified that will occupy semi-shade microclimates under the panels.

Green roofs are exposed environments subject to wind erosion therefore the mix contains pioneer and ephemeral species such as annuals, biennials and short perennials, which establish quickly from seed and help to stabilise the substrate and prevent wind erosion prior to perennial root systems getting established. A small percentage (typically <15%) of the mix contains non-aggressive grass and sedge species, which will also help to establish and stabilise the substrate.

The seed source is British Provenance (with the exception of sedum species) and suppliers of the mix adopt the Flora Locale Code of Practice for collectors, growers and suppliers of native flora.



(Flora locale is an independent charity. Promoting and advancing the conservation and enhancement of native wild plant populations)

Bauder's Unique Additive Mix

Establishing seed at roof level is difficult, to maximise the germination and establishment of the diverse range of seed used, Bauder has developed a unique blend of seed adhesive, organic nutrients and mycorrhizal fungi to encourage water and nutrient uptake by the developing seedlings.

- The seed mix and additives are combined with a bulking agent which enable the correct sowing rate to be achieved, the adhesive binds the seed to the substrate preventing it from being blown away in windy conditions or washed deep into the substrate and failing to germinate.
- A small quantity of organic slow release fertiliser gives the seed a gentle boost as it establishes. Mycorrhizal fungi increases the root surface area helping the transfer of water and nutrients from the substrate to the developing root system of the plant, enabling the plants to establish quickly.



Bauder Flora 3 Seed mix guide

5.18 Lighting strategy

The external lighting proposed within the development has been designed to E3 classification for 'small town centres or suburban locations' with an upward light output ratio no greater than 15%. The design minimises any disturbance to the local nocturnal wildlife present along the existing 'dark corridor' of the River Crane and prevents nuisance to residents with front-facing windows.

The road and car park lighting illuminance will comply with BS5489-1:2013 code of practice for outdoor car parks and a quiet traffic flow of P6 lighting class. All vehicle and pedestrian routes are outside the 5m buffer zone along the river.

Along the riverfront, a 5m buffer zone restricts the amount of light spill reaching the sensitive 'dark corridor' of the River Crane. This ensures the development has the absolute minimum impact on wildlife. The 5m wide buffer zone will be heavily planted and have a 1.5m high hedge with 600mm tall woven willow trellis to the southern face to prevent any light spill from the development onto the River Crane. As excessive lighting can damage bat foraging, the minimal use, low-level light bollards and external lighting are directed away from the river.

The lighting will be designed in line with the Exterior Lighting Assessment by Desco. A full analysis of the lux levels around the river has been undertaken and has been submitted in a separate report as part of this application. This ensures the proposals are suitable for the location and do not effect the existing 'dark corridor'.

Key design measures of proposed external luminaires:

- LED lamps with no UV emissions (minimising disturbance to bats and ensuring insects are not attracted away from neighbouring habitats)
- Integrated reflectors, louvres and diffusers (controlling the direction and spread of light and avoiding unnecessary light spill and upward light pollution)
- Located so the illuminance between lighting drops below 1 lux (encouraging bats to fly between and prevent the formation of a 'light barrier')
- No uplighting proposed (avoiding illuminating bat foraging and commuting habitats)



Precedent image for light column

Key

- LED column lighting
- LED wall mounted luminaire

