CITY OF LONDON

CITY PUBLIC REALM

PEOPLE PLACES PROJECTS

TECHNICAL MANUAL

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INTRODUCTION

History has left an indelible mark on the City's public realm, composed as a rich tapestry of ancient meandering highways, intimate lanes and alleyways, cherished open spaces and hidden gardens and churchyards. These streets and spaces form the constant backdrop to city life and the ever-changing urban fabric. Since Roman times, they have provided a genuinely public place of trade, residence and ceremony. Today, this varied and dense urban realm provides an array of interconnected routes and opportunities for interaction, commerce and cultural expression.

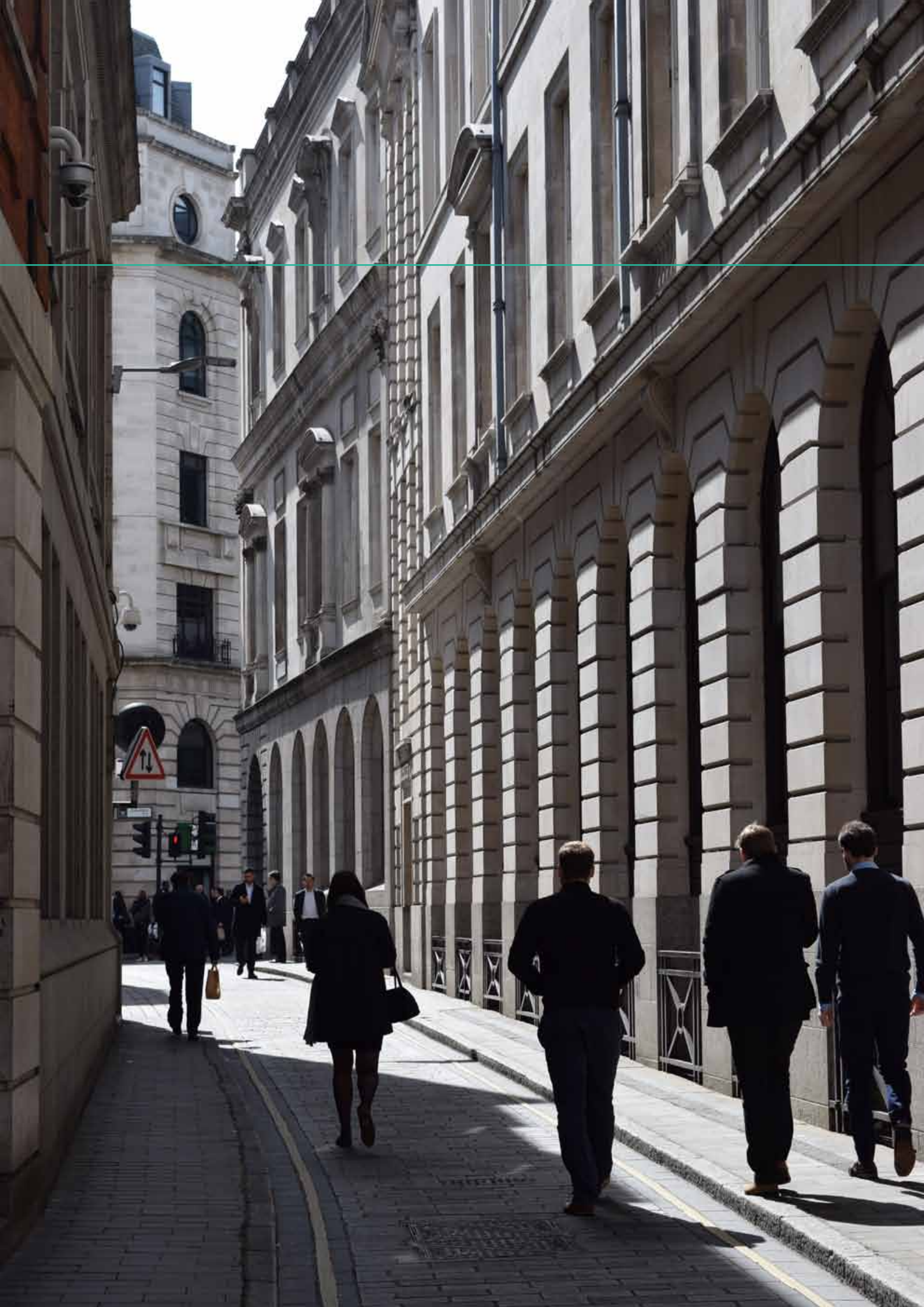
The furnishing of the public realm, from its paved surfaces to its distinctive furniture livery to the provision of statuesque trees and green spaces, presents a harmonious and identifiable treatment extending throughout the City, reflecting its unique and intrinsic character. This Technical Manual seeks to build upon the recent and ongoing public realm enhancement projects and ensure the City's public realm continues to present a safe, inclusive and welcoming sense of place, respectful of ancient heritage and befitting a rapidly evolving world-class city.

ABOUT THIS TECHNICAL MANUAL

The purpose of this technical manual is to act as a reference document for designers and developers operating within the public realm and private spaces of the City of London. It provides guidance on the material selection, visual aesthetic and quality expectations for surface materials, street furniture, trees and planting. It is the expectation that these elements will offer a lasting contribution to the streets and spaces of the City as a whole and should be responsibly sourced, robustly implemented and maintainable.

The contents of this public realm Technical Manual are both prescriptive, where specific materials and elements are generally to be used, as well as descriptive, outlining the expectations on design, layout and other material considerations. This manual should to be read in conjunction with the City Public Realm SPD (adopted 2016) and will be updated periodically over time.

Certain spaces within the City, often brought about by new development, offer the chance for greater and more distinctive spaces, building upon and extending the rich history of change. In such instances, there may be exceptional opportunities to vary the baseline guidance on material selection and introduce more tailored and bespoke design solutions extending the sense of quality placemaking within the City. Such exceptional circumstances are to be discussed with the City Public Realm team at the City of London Department of the Built Envionment.



1 SURFACE MATERIALS

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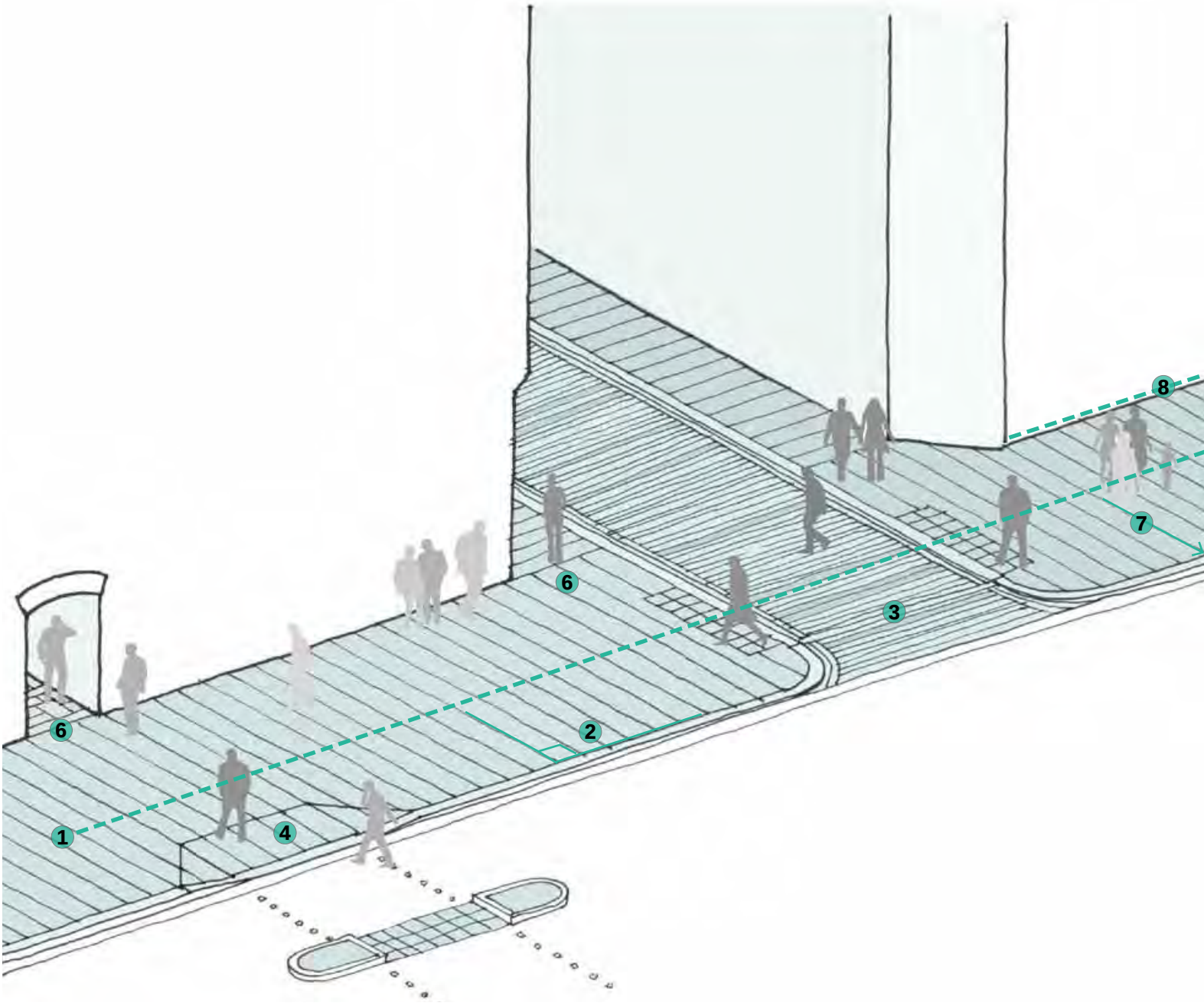
A connected, inclusive and intuitive pedestrian experience is key to the ongoing success of the City's public realm. There are three principal surface materials used to furnish the streets and spaces within the City - York stone, granite and asphalt.

This section on surface materials outlines the various unit sizes, material finishes and compostion of such materials and how they are combined to ensure a distinctive and lasting ground plane is established for the City now and into the future.

A set of guiding principles for surface materials are outlined, supported by Illustrative material composition studies. These represent the standard details and layouts expected within the City's public realm.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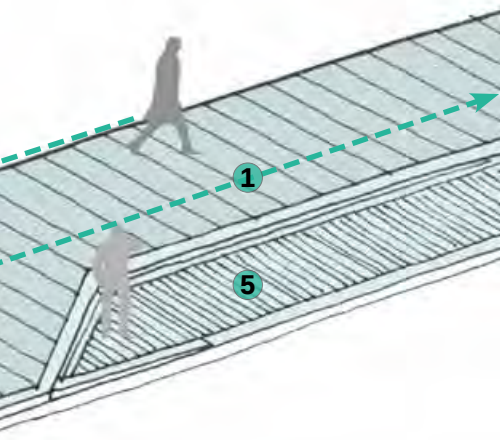
1 SURFACE MATERIALS



	PRINCIPLES OF STREETSCAPE COMPOSITION
	Surface treatments to streets and spaces within the City are to be informed by the following key principles as illustrated
1	Primary street paving runs through
2	Paving is laid perpendicular to the kerb line not building line
3	Raised tables provide courtesy crossing of secondary routes
4	Dropped kerbs at key carriageway along desire lines
5	Integrated loading bays to maximise pavement widths
6	Surface paving grain and kerb width may be reduced on narrow streets and alleyways
7	General drainage crossfall of 1 in 40 to be observed
8	Mastic infill may be needed against building edges to avoid gap formation with adjacent surface material but infill width to be kept to a minimum

SALE
JAEGER
JAEGER
RIVER ISLAND

York stone paving

Standard Footway paving

The standard module of York stone paving to be used on the City footways is 600mm wide, cut in random lengths and 63 or 75mm thick with a diamond sawn finish. This paving is to be laid in a random course running perpendicular from the kerb line to the building.

Key Criteria	
Material	Scoutmoor
Appearance	Diamond sawn all sides
Unit Sizes	600mm width x varying length x 63/75 mm deep
Jointing	6 mm
Sealant	Pave Saver contamination repellent

York stone paving

York stone Setts

Smaller unit York stone paving is to be laid only in narrow footways (less than 1500mm wide) where heavy vehicles often mount the footway or in central pedestrian island crossings where paved space is at a premium.

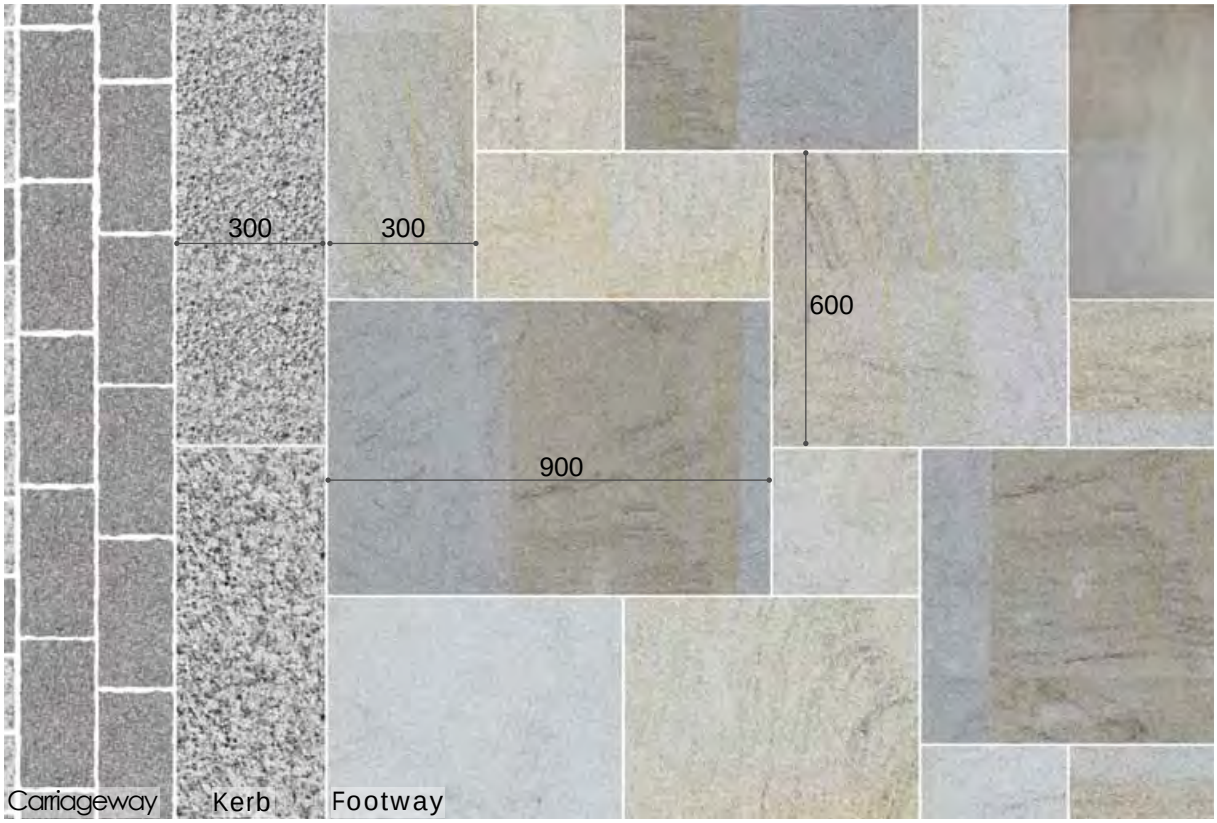
Key Criteria	
Material	Scoutmoor
Appearance	Diamond sawn all sides
Unit Sizes	200 x 300 x 63/75 mm
Laying pattern	Half-lap(staggered)
Jointing	6 mm
Sealant	Pave Saver contamination repellent

York stone paving

Manchester bond

The more intricate and tesselating Manchester bond can be used in historic streetscapes, landscaped areas or in smaller spaces that are irregular in shape.

Key Criteria	
Material	Scoutmoor
Appearance	Diamond sawn all sides
Unit Sizes	300x300 / 300x600 / 600x600 / 600x900 x 63/75 mm deep
Jointing	6 mm
Sealant	Pave Saver contamination repellent

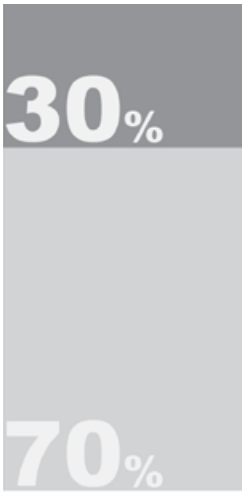


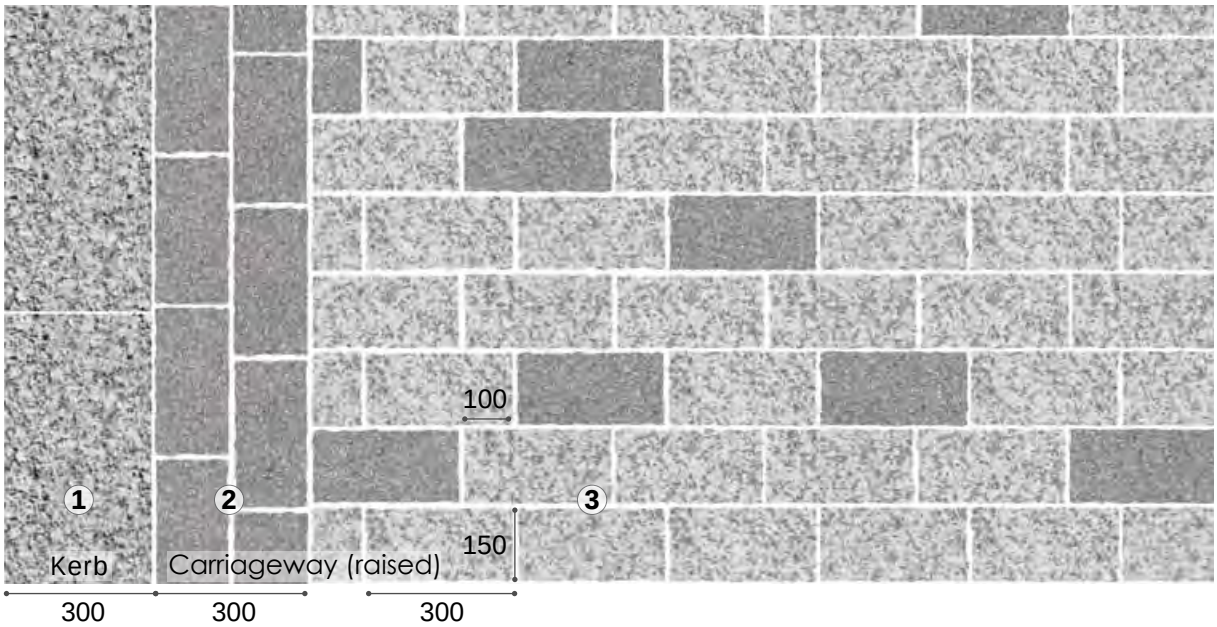
Granite Setts

2 Colour mix

Granite setts are to be laid as carriageway surfacing in historic streetscapes where appropriate and for courtesy crossings. The two colour mix of light and mid grey granite is to be laid in a random pattern, with a double mid grey channel against all kerb edges.

Key Criteria	
Material	Granite
Appearance	Flamed top surface Diamond sawn all sides Hewn top edge to 20mm
Unit Sizes	300 x 150 x 150 mm thick
Jointing	10 mm wide, 3mm recessed
Colour	30 % mid-grey / 70% silver grey
Illustrative plan	① Silver Grey Granite Kerb ② Double Mid Grey channel (300 x 150mm) ③ 2 Colour Granite sett mix (300 x 150mm)



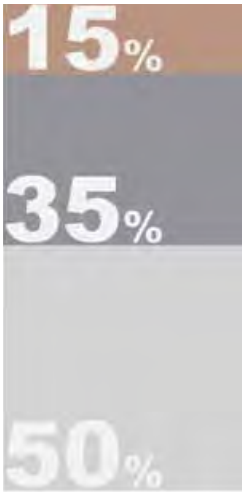


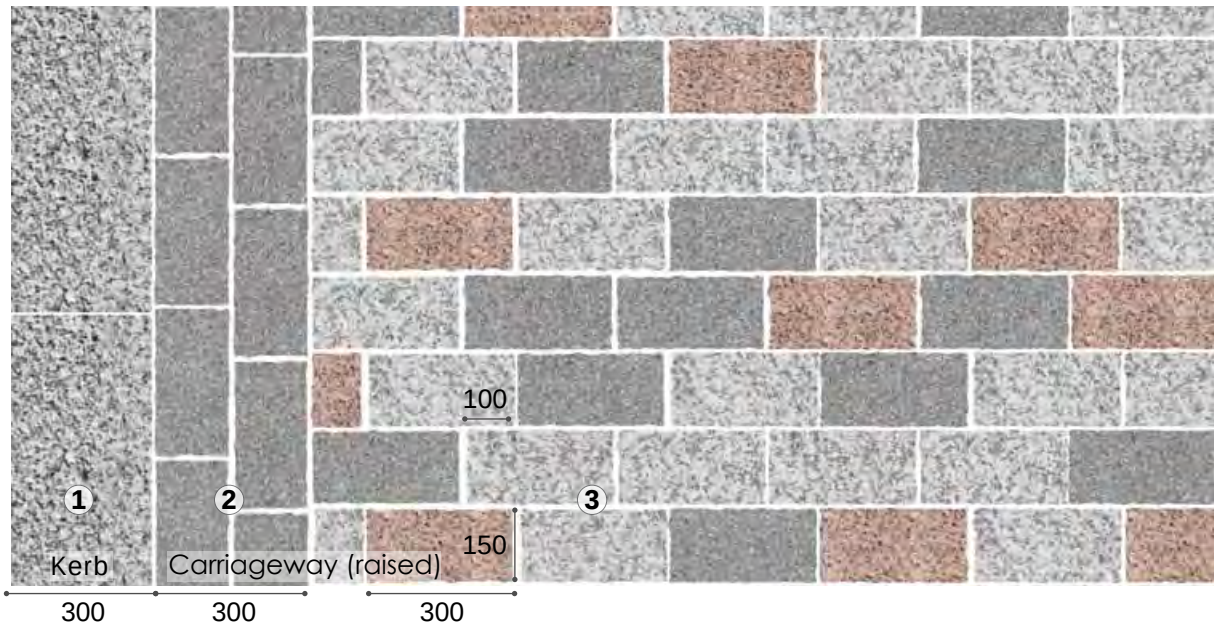
Granite Setts

3 Colour mix

The three colour granite mix introduces a pink toned granite to accompany the light and mid grey colours and is to be used in historic settings including conservation areas. To be laid in a random pattern, with a double mid grey channel against all kerb edges.

Key Criteria	
Material	Granite
Appearance	Flamed top surface Diamond sawn all sides Hewn top edge to 20mm
Unit Sizes	300 x 150 x 150 mm thick
Jointing	10 mm wide, 3mm recessed
Colour	15% pink 35 % mid-grey 50% silver grey
Illustrative plan	① Silver Grey Granite Kerb ② Double Mid Grey channel (300 x 150mm) ③ 3 Colour Granite sett mix (300 x 150mm)

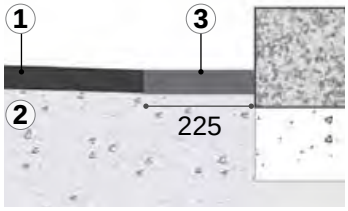




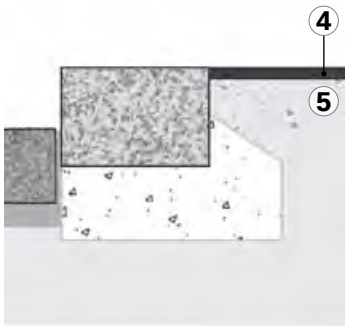
Asphalt

Asphalt is used as the principal carriageway surfacing material throughout the City. It is also used along footways as an alternative surface to York stone. The City of London Highways department should be consulted over its use and full specification with particular consideration given to the management and disturbance caused by service utilities disruption and repair.

Key Criteria		Ashpalt Carriageway
Surface course	1	Hot Rolled Asphalt with 0-10 mm chippings or high stone content
Surface thickness		50 mm thick
Base	2	300 mm thick concrete base to Highways standard
Mastic channel	3	225 mm wide 50mm thick mastic asphalt channel beside kerb



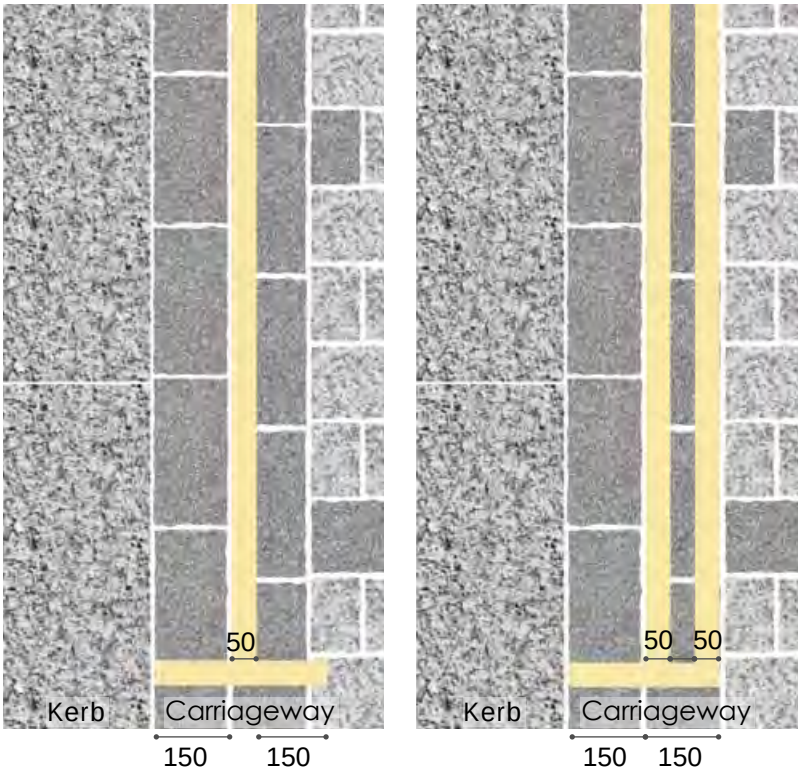
Key Criteria		Ashpalt Footway
Surface course	4	Mastic Asphalt
Surface thickness		25 mm thick (minimum)
Base	5	100 mm thick concrete base to Highways standard



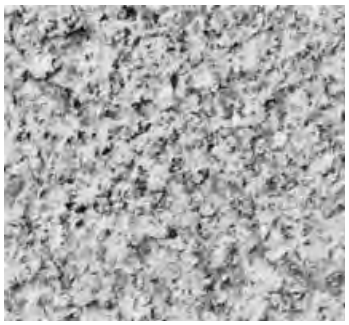
Road markings

Road markings should be designed and laid so as to minimise their visual impact, while still conforming fully to the relevant legal requirements set down in The Traffic Signs Regulations and General Directions 2016 and clearly demonstrating the requirements of the relevant Traffic Management Orders to road users. This can be achieved through using the narrowest line widths, the shortest kerb mark lengths and the smallest wording permissible under the Regulations; and by omitting all unnecessary optional markings. In addition, where road markings are required to be in yellow, the Deep Cream colour should be used. These principles should be applied throughout the City to ensure a consistent approach.

Key Criteria		
Colour	Deep Cream	
Material	Thermoplastic paint	
Line width	50mm	
Illustrative plans	**Single line marking**	**Double line marking**



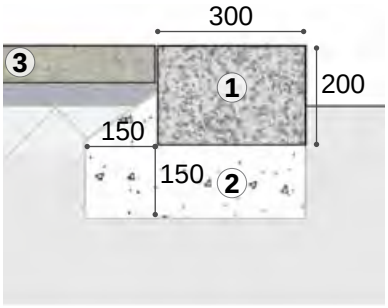
Kerbs

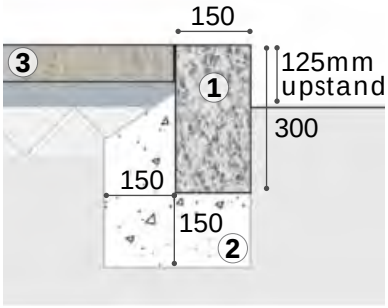


Silver grey granite is to be used for all kerb edges. Kerb width is dependant upon the overall scale of the street but 300mm wide kerb is the predominant width for newly installed kerbs. A narrower 150mm wide kerb may be used for narrow lanes and alleyways as well as for courtesy crossings.

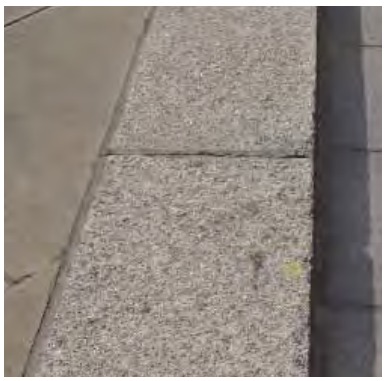
Additionally, narrow York stone edging kerbs (50 x 225mm) may be placed at the rear of footpaths or planted areas to provide a flush transition. These edge kerbs may also be used to mark a change in york stone paving direction.

Key Criteria		
Kerb type	**Wide kerb**	**Narrow kerb**
Material	Granite	Granite
Colour	Silver grey	Silver grey
Appearance	Flamed finish front and top face, sawn all sides	Flamed finish front and top face, sawn all sides
Dimensions	300 x 200 x 900 mm Straight lengths / radial units	150 x 300 x 900 mm Straight lengths / radial units





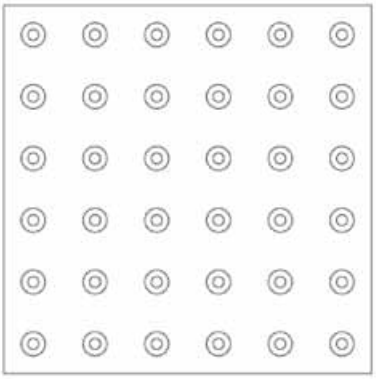
1. Granite Kerb
2. Concrete bed & haunch
3. Adjacent footway

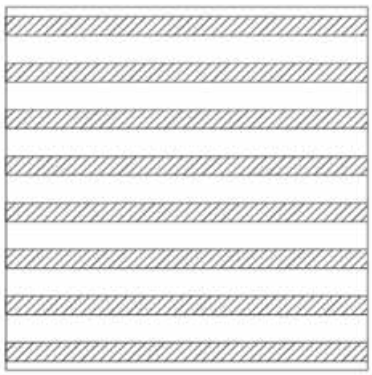


Hazard warning paving

Tactile or hazard warning paving is to be used where pedestrian users will potentially encounter a change in surface continuity or free movement, such as interacting with vehicle cross movements or defined level changes in the form of steps. In general, tactile paving should be formed out of York stone to maintain a continuity with footway materials. The tactile nature of blister or cordoroy paving units are described below. The Corporation's Access Team should be consulted on all street enhancement schemes.

Key Criteria		
Paving type	**Blister paving**	**Corduroy paving**
Description	Blister tactile paving is to be used at controlled crossings and where there is an uncontrolled crossing point across a vehicular route, such as a raised table, to warn users of the danger and minimise risk of inadvertently walking into a vehicle route.	Corduroy tactile paving is used in association with steps or where visually impaired people need to be warned of a hazard and advised to proceed with caution. Corduroy paving should be supplied in the same material as the surrounding paving to provide visual integration.
Unit Size	400 x 400 x 63mm thick	400 x 400 x 63mm thick
Material	Scoutmoor York stone	to match surrounding material
Laying pattern	Stack bond to national guidelines	Stack bond to national guidelines
Appearance	Raised circular blisters to meet technical access standards	Grooved stone to meet technical access standards





Inspection covers

The integration of inspection covers within the streetscene will follow the principle to align access and inspection covers where posssible to the general grain of paving slabs, for both existing and newly placed covers as part of streetscape improvements.

The insertion of recessed manhole covers within the footway will ensure continuity of paving surface material with the expectation that paving joints will run through the recessed cover. Not all covers allow for recessed material, such as fire hydrants and sewer covers, but where applicable 100mm deep inset covers to loading class B125/C250/D400 (location dependant) will be encouraged. The Corporation's Highways team are to be consulted for appropriate specification.

Drainage furniture

Drainage Channels

Linear drainage channels are to be used to collect surface water where gullies are not suitable. A standard cross grooved channel cover width of either 149mm for pedestrian or 199mm for carriageway is to be used. The narrower channel may be used on footways for private boundary definition and localised drainage points.

Key Criteria	
Product	*Hauraton SW100/6 'Heelguard' grating*
Supplier	Hauraton
Class	C250 for footways / D400 for carriageway/vehicle crossovers
Channel type	Faserfix Super KS100 channel
Material	Galvanised steel
Dimensions	149 / 199 mm in width with 10mm spacing crosshatch grip

Gully Covers

Gully covers are to be integrated into both footway and carriageway pavement design with detailed consideration given to surface falls and gradients as part of the drainage design.

Key Criteria	**Footway**	**Carriageway**
Cover location		
Product	*Hauraton City (Class C250)*	*City (Cycle friendly DU5801M) (Class D400)*
Supplier	Hauraton	Durey Castings
Material	Stainless Steel grating & frame, Straight bar, 10mm spacing	Ductile Iron Black painted
Dimensions	300 x 300 x100 mm	450 x 400 x100 mm

Courtesy crossings

Pedestrian priority over vehicles should be extended through the introduction of raised courtesy crossings where appropriate. Easily negotiable street crossing points consisting of a raised area of carriageway between footways effectively makes the footway continuous and can significantly enhance the walking experience. People should be able to cross streets frequently and in a direct, inclusive and uncomplicated manner. Raised crossings may continue as raised carriageways or descend after crossover to maintain kerb edge continuity.

Granite setts are the principal material to be used for courtesy crossings within the City. Asphalt surfacing and on occasion small unit York stone setts have also been used.

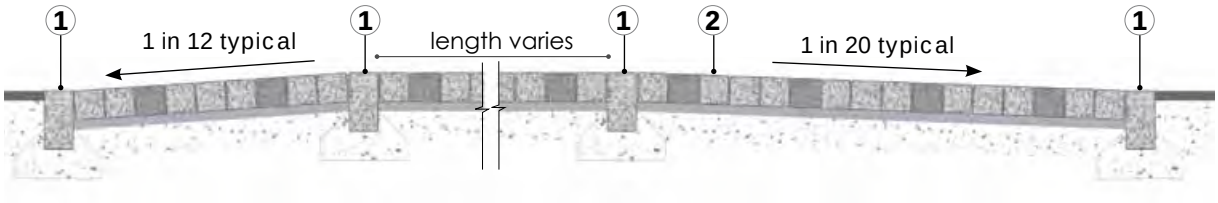
Granite setted courtesy crossing

Courtesy crossings

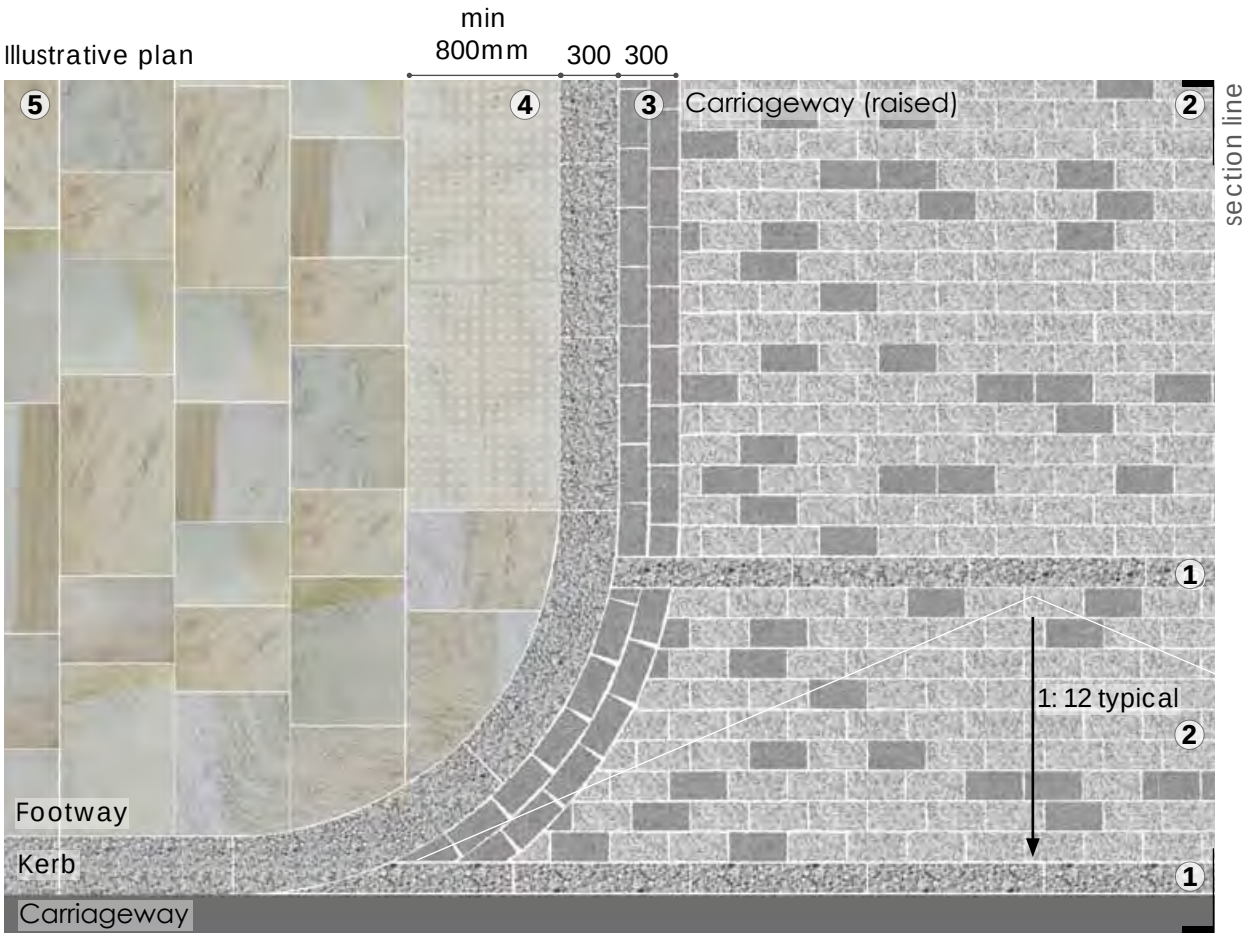
1. Narrow flush granite 150mm Granite kerb
2. Granite sett mix (300x150)
3. Double Mid Grey Granite channel
4. York stone blister tactile slabs
5. York stone footway

Raised crossings must provide appropriate tactile hazard warning paving in the form of blister paving slabs on approach. Granite setted courtesy crossings maintain the double mid grey channel beside kerbs, with standard narrow granite kerbs at the top and bottom of the sloped gradient.

Illustrative section



Illustrative plan

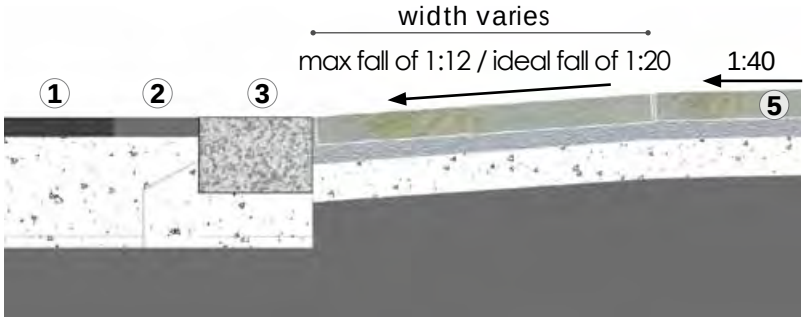


Dropped kerbs

Dropped kerbs, whereby the pedestrian footway is lowered to meet adjacent carriageway, may be used at both controlled crossings and informal, uncontrolled crossings along pedestrian desire lines. The creation of accessible gradients to the sloped surface should be constructed as a continuation of the surrounding pavement materials, establishing a seamless integration and maintaining pavement continuity. The dropped kerb is generally to be laid flush with carriageway surfacing, with a maximum upstand of 15mm permissable.

Illustrative plan & section

1. Hot Rolled Aphalt Carriageway
2. Mastic channel 225mm
3. Wide 300mm Granite Kerb
4. Transition Granite kerb
5. York stone footway



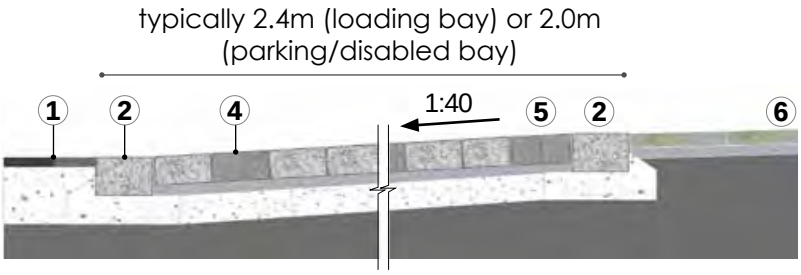
Loading bays

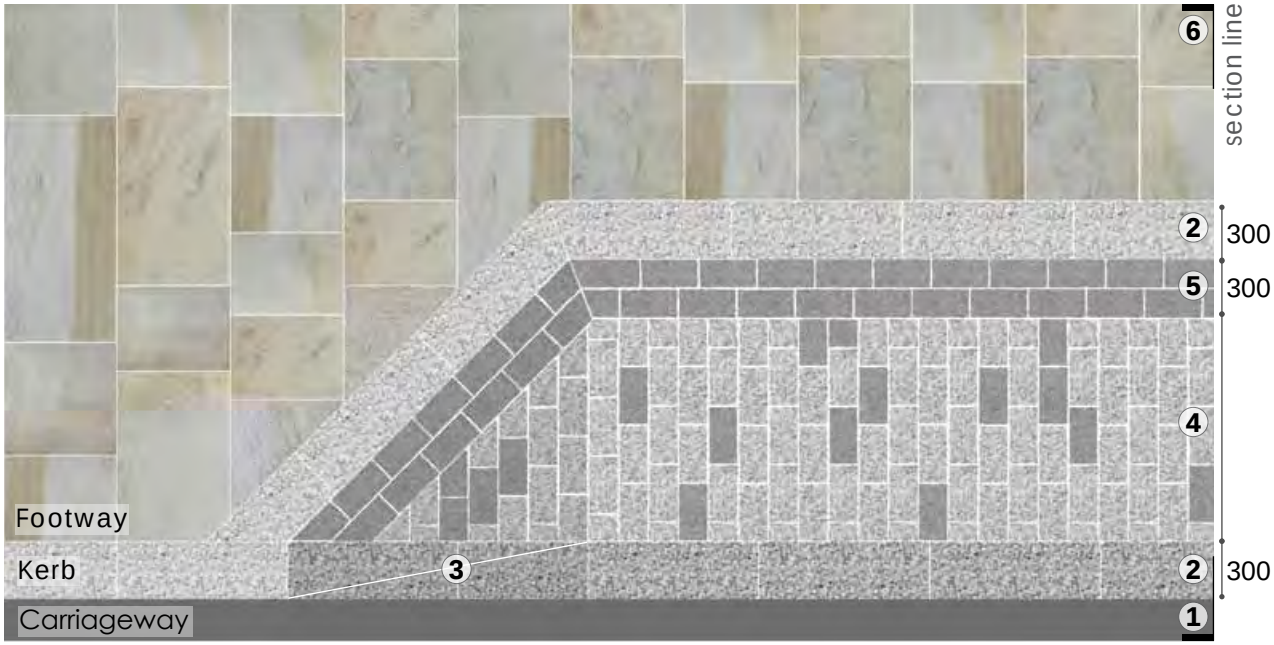
Loading bays incorporated into the pedestrian footway provide a defined area for the delivery of goods, where streetside loading and unloading is necessary. The location, capacity and management of such bays are subject to the Corporation Transportation Team's approval.

Loading bays are to be constructed of granite setts running perpendicular to the kerbline and sloped towards the carriageway, establishing a step free pavement continuity when not occupied by delivery vehicles. The inclusion of bollards for vehicle control should be considered in relation to available footway width and pedestrian flow.

Illustrative plan & section

1. Hot Rolled Aphalt Carriageway
2. Wide 300mm Granite Kerb
3. Dropper Granite kerb
4. Granite sett mix (300x150)
5. Double Mid Grey Granite channel
6. York stone footway





Historic lanes

The fine grain of historic lanes and alleyways offer a significant and particularly characteristic contribution to the public realm network of the City.

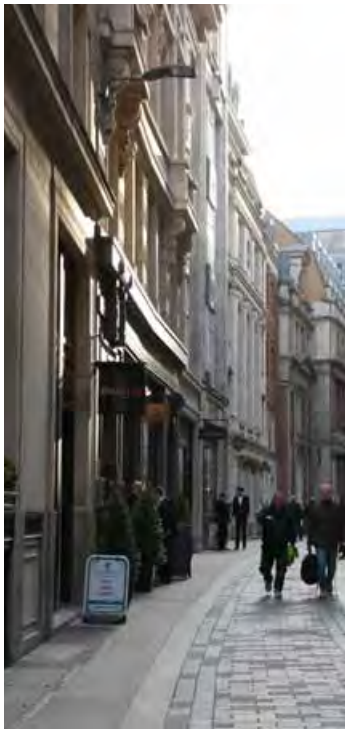
The alignment, connectivity and often narrow proportions of these routes, allied with historic place names, provide an intricate and important canvas for public realm enhancement. Considerations influencing any design enhancement works and material arrangements should include;

- The individual character and history of each location
- The historic alignment of the street or space
- The level of intensity of pedestrian or vehicle movements
- The available width and proportion of street or space e.g. sufficient safe inclusive width of footway

The above factors should determine the most appropriate design response, in particular the decision whether to lower or raise the carriageway and also the appropriate detailing of carriageway and footway surfaces, such as historic kerb retention and the use of granite setts.

Historic lanes

Retained raised kerb to carriageway



Raised carriageway with flush kerbline

2 STREET FURNITURE

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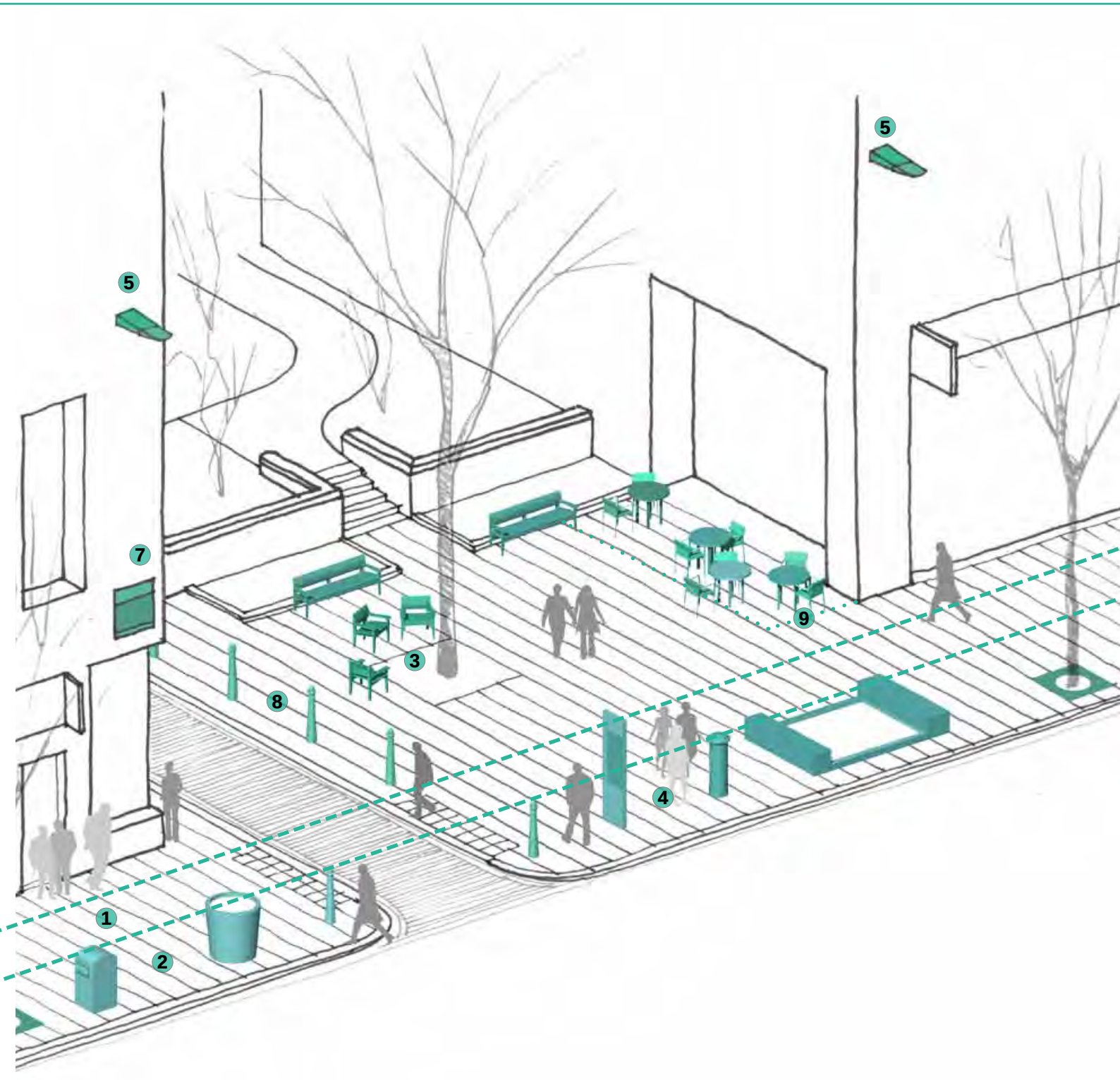
Heritage features

Street furniture provides a range of opportunities to guide, inform, pause and participate with the public realm of the City. This section identifies the elements of furniture that contribute to the street scene and considers their placement and distribution. It is the intention that such items provide a high quality, convenient and comfortable experience to all users who engage with them and do not clutter the public realm or impede movement and activities. The public realm and its furnishings should respond to ongoing need and in places offer techological connectivity, such as wi-fi and power provision, to encourage the increasingly popular outdoor usage of the public realm by city workers and visitors alike.

A set of guiding principles for furniture placement is outlined, supported by descriptions of furniture elements and key criteria for specification.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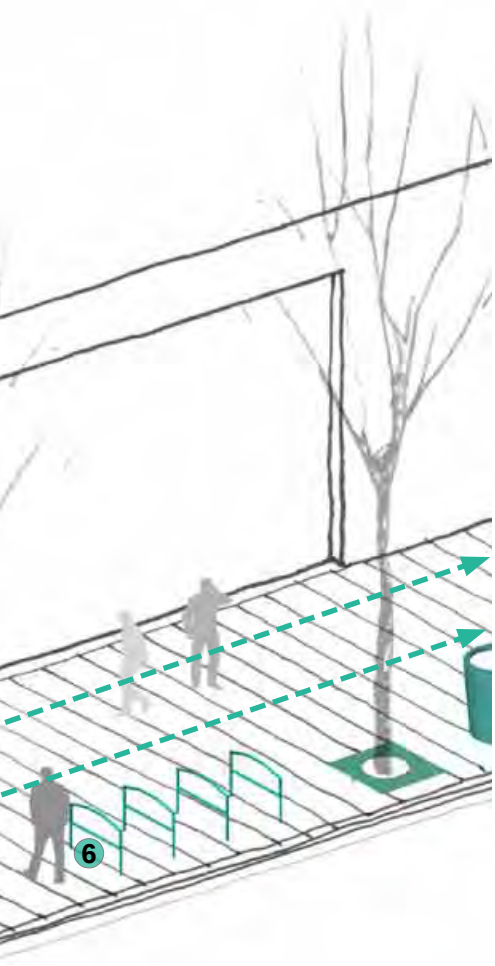
2 STREET FURNITURE



	PRINCIPLES FOR STREET FURNITURE PLACEMENT
	Street furniture opportunities within the City are to be informed by the following key principles as illustrated
1	A clear pedestrian width of 2 metres where possible is to be maintained along the street, free of obstacles and clutter
2	Street furniture should be located in a zone adjacent to the kerbline to maintain unobstructed access to building frontages
3	Where space allows, groupings of street furniture such as seating clusters may be positioned to reinforce sense of place and destination
4	Items such as post boxes and signage should offer a clear space for gathering around and avoid obscuring the vision and visibilty of users when crossing the carriageway
5	The City has unique powers to affix lighting onto buildings. Lighting columns are only considered in exceptional circumstances
6	Cycle stands should be located beside kerb lines
7	Traffic Signs should be mounted onto buildings where appropriate to reduce street clutter
8	Bollard placement should be informed by definite need and carefully considered in response to context and movement patterns
9	Inlaid boundary demarcation studs to denote ownership

Bollards

Historic bollard example

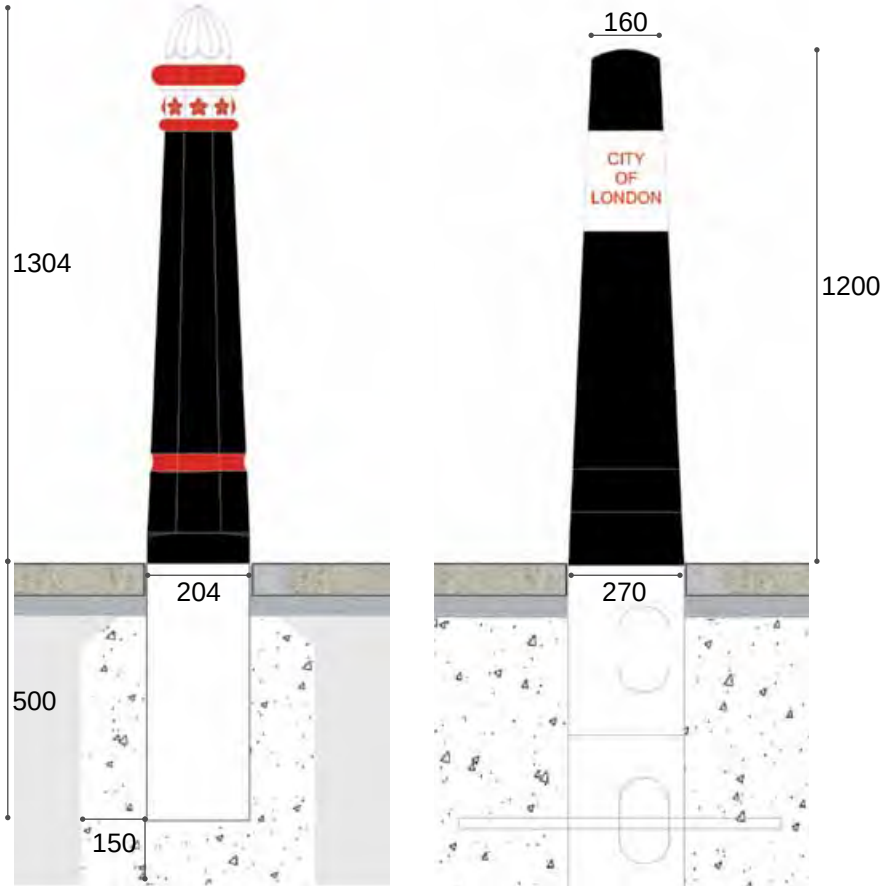
There are two principal bollard types to be used; the C3 and D3 Type bollards. They should be used where there is a definite need and their placement should be carefully considered to avoid overcluttering the streetscene. Bollards provide protection to both paving and buildings and offer safety for pedestrians.

Options exist for either demountable bollards, where required, or upgrading to become crash rated bollards where vehicles may overrun footway eg. C3 bollards. The management of removable bollards should be agreed with CoL Highways Department.

In addition, there are a wide range of historic bollards throughout the city which should be retained and restored wherever possible as they reinforce local character. Historic bollards can also be re-cast for use in street enhancement schemes.

C3 Bollard

D3 Bollard

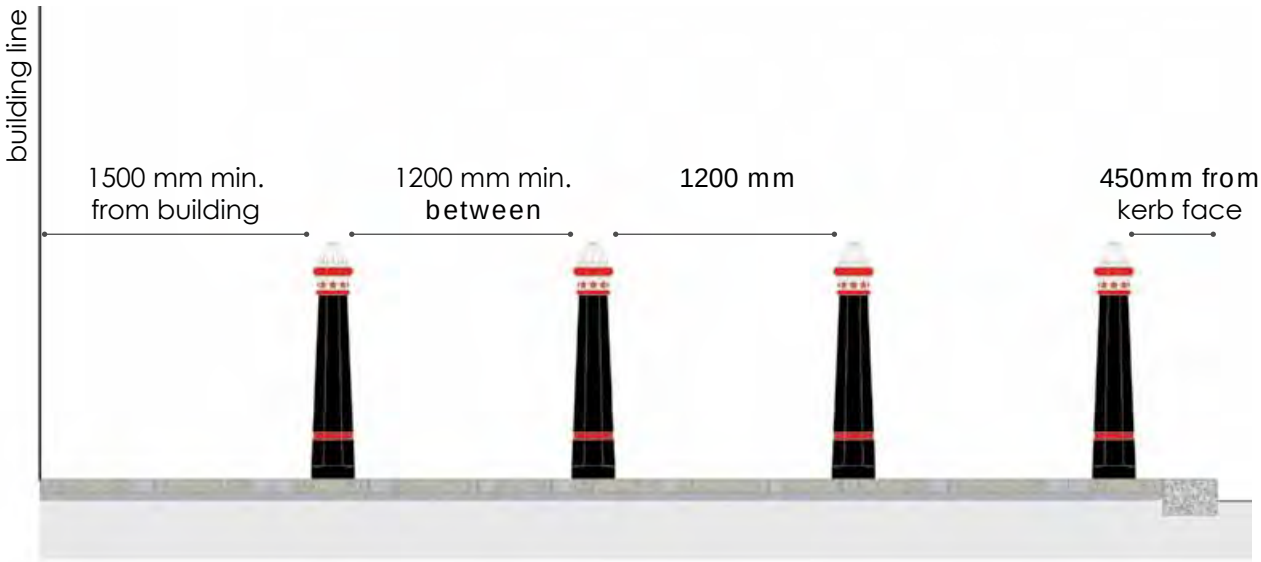


C3 Bollard **D3 Bollard**

Bollards

Where required, the placement of bollards should follow the minimum spacings between bollards outlined below when placed adjacent to buildings and kerbs.

Placement Criteria	
Bollard to Building	1500 mm preferred minimum
Bollard to Bollard	1200 mm clear between bollards
Bollard to Kerb	450 mm minimum from the front face of kerb



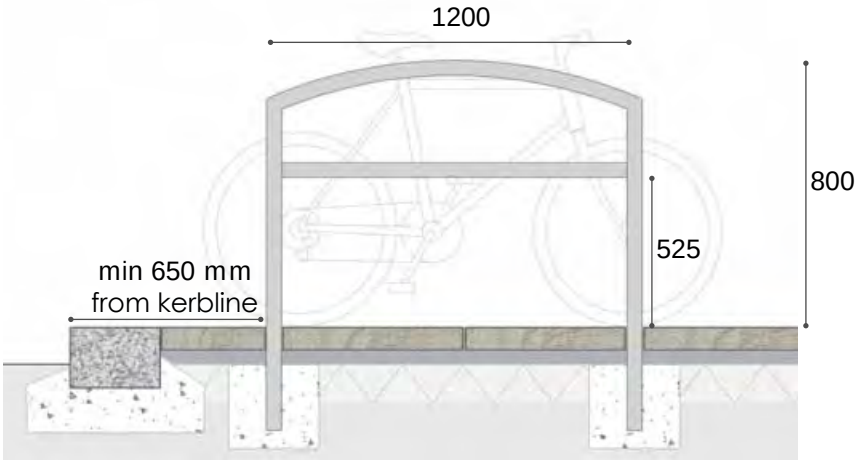
Footway cross-section

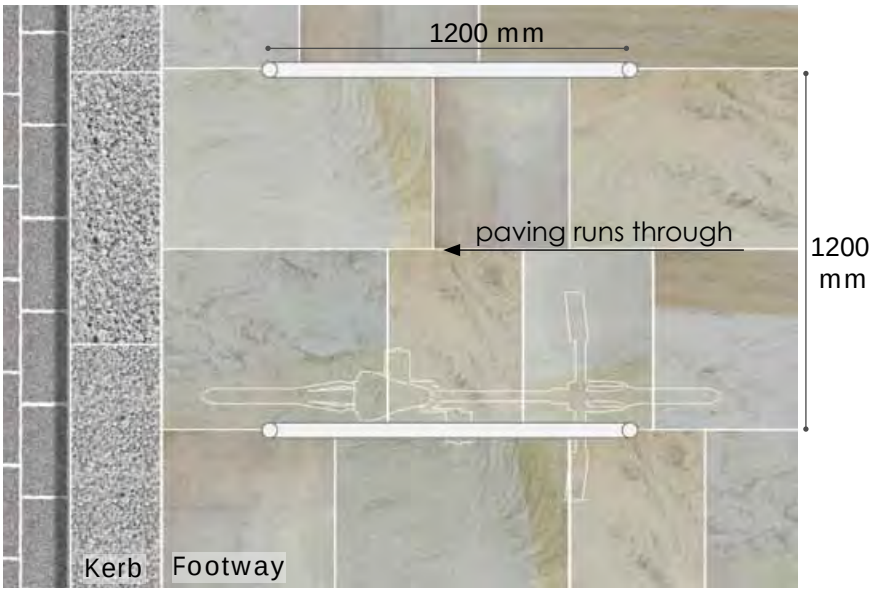
Cycle stand

Cycle stands are to be located in safe, well surveilled and convenient locations in response to an existing or anticipated need for cycle parking. 'A' frame stand groupings generally range from 3 to 12 in number, spaced to accommodate two cycles per stand with additional secure fixing provided by the crossbar. Cycle paths within pedestrian priority spaces may be marked with an inlaid natural stone marker slab.

Key Criteria	
Product	*Arc Cycle stand*
Supplier	Dee-Organ Ltd
Appearance	48 mm Ø brushed tubular stainless steel

Inlaid natural stone cycle lane marker slab





Litterbins and recycling bins

Litterbins should be placed where they do not obstruct pedestrian desire lines and the visibility of users, are carefully positioned to reduce clutter and visual impact and are inkeeping with the surrounding built environment.

Key Criteria	
Product	Big Belly Solar Compactor bin
Supplier	570 litres
Material	Galvanized sheet metal steel interior and exterior construction
Appearance	Black painted with City of London logo

Cigarette butt bin

Cigarette butt bins may be post mounted, bollard mounted or floor-mounted on freestanding bases. The intention is to provide a convenient and accessible way to manage the challenge of cigarette butt and chewing gum collection to avoid littering the streets of the City.

Seating

Timber backed benches

Individual timber seats

Stone seating

Moveable furniture

Seating is a vital component of the City public realm. Comfortable seating should be placed in the right locations and out of pedestrian desire lines, with sufficient space either side of designated furniture to invite all users to pause safely. Considered seating provides users with a place to rest or to stay longer and contribute to a livelier City.

A range of seating options exist to create opportunities for pause, in either individual groups or on larger capacity benches. Timber benches should preferably be constructed from oak, with intermediate arms to assist people with disabilities and discourage rough sleepers. Informally arranged groups of 2 to 3 seats provide points of interaction, often fitting easier into small scale schemes to provide further enjoyment of the street scene. The fixing of seats to the ground is a key consideration.

Stone seating fits well in more contemporary streetscapes, often in conjunction with planting beds, and forms attractive and robust multi-functional seating elements that should include integrated edge protection measures.

Moveable furniture, such as the red and black City of London folding chairs and tables, have been introduced within urban spaces. They provide further occasional seating opportunities and introduce flexibility to outdoor seating provision. Opportunities for such temporary furniture should be discussed with the City's Public Realm section.

Integrated seating and planting

Integrated furniture protection

Groove cut into stone

Stone upstands and armrests

Street furniture elements are exposed to general wear and tear and activities such as skateboarding often resulting in damage. Furniture elements that may be affected are planters, walls, steps and benches, and in particular long exposed lengths of seating and walling.

It is important to consider potential problems and measures to restrict damage at an early stage in the design process. Considerations over the positioning of street furniture elements, their height and material choice may all influence the exposure and risk of damage. Protective measures should be'designed-in' to all street enhancement schemes where vulnerable features or exposed edges are included.

In the case of stone furniture and edges, the insertion of grooves cut into stone elements add a 'break' to a continuous edge. Similarly the surface treatment of the stone finish, such as cropping or rustic finish, may also provide deterrent. Intermediate armrests or upstands to benches not only provide edge protection but also add additional ease of use and comfort for the user.

Rough cropped stone face to planter

Wayfinding and interpretation signs

The family of wayfinding signs within the City includes map points, node points, fingerposts and wall-mounted directional signs. All signs are constructed from black anodised aluminium to give a high quality, long-lasting finish. The map points and node points also include vitreous enamel maps to aid way-finding. Interpretation signs are also included to reinforce sense of place and may contain information about the history of an area or refer to historic facts and events.

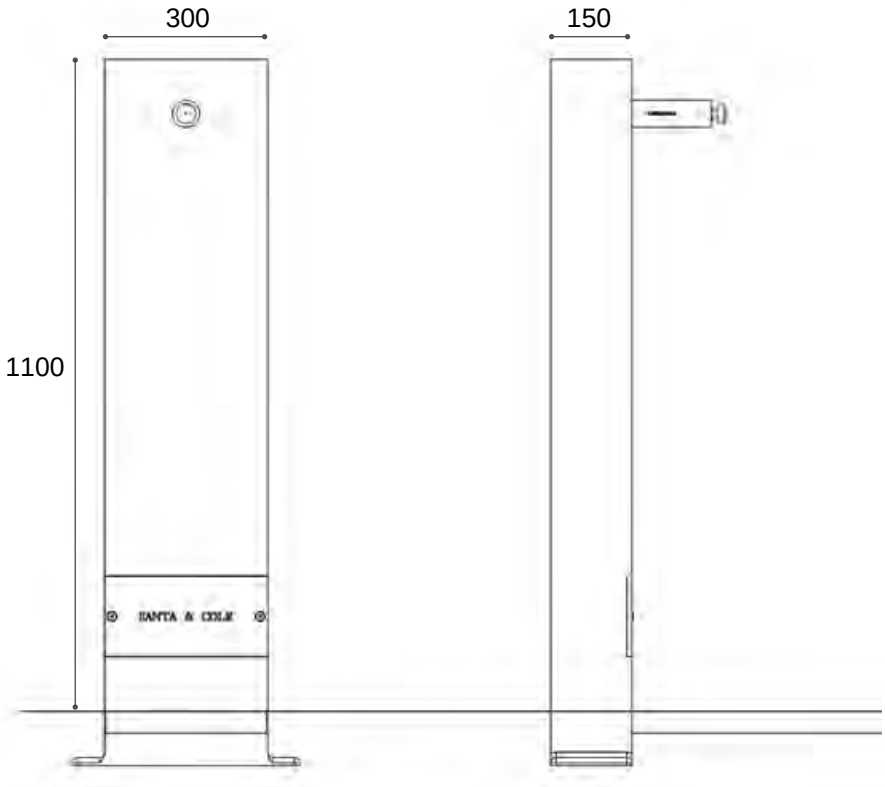
Signage suite

Finger post | Wall mounted | Node points | Map boards

Drinking fountains

The provision and distribution of public drinking fountains is determined by need brought about by high pedestrian footfall and visitor demand. Such fountains are generally only located in larger public gathering spaces associated with visitor attractions and locations are subject to further consultation with the City's Public Realm team.

Key Criteria	
Supplier	Santa & Cole
Material	Black painted, Bronze tap
Dimensions	1200 x 300 x 150 mm



Steps and handrails

Steps and handails are required where immediate level changes occur along footways, within urban spaces or on approach to buildings that cannot be resolved in an inclusive manner by using surface gradients and slopes. The preferred approach to step design is to use natural stone, either York stone or granite, with the appropriate colour contrast applied to step nosing. Tactile corduroy paving to match the surrounding surface materials is required.

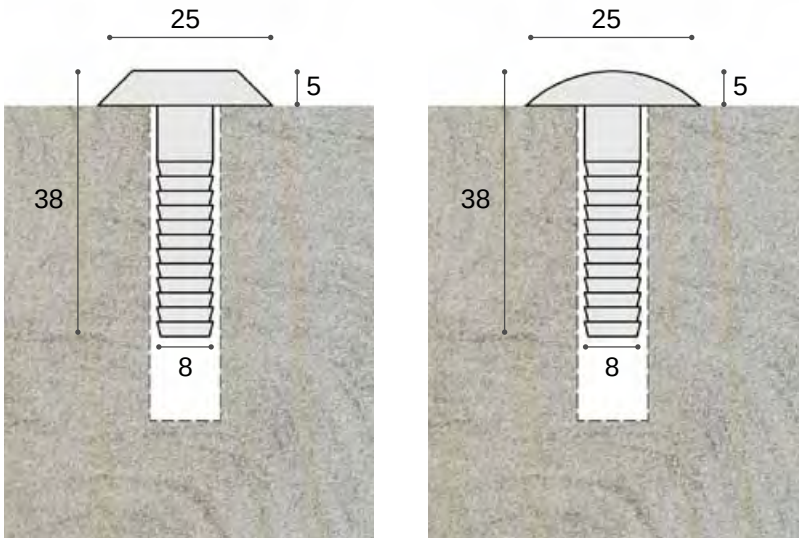
Handrail design must accord with relevant access guidance in terms of material choice, profile, placement and integrated protective detail to resist damage and misuse. The Corporation's Access team is to be consulted on step requirements and design.

Boundary demarcation studs

Inlaid metal boundary studs are to be provided within footway surfacing to demark ownership boundaries within the City. The delineation of ownership does not mean surface materials should be changed and continuity of material to unify the street scene will be encouraged.

The circular studs are installed with a 5 mm upstand and may be either domed or bevel edged.

Key Criteria	
Material	Brass or Strainless steel (subject to location)
Supplier	Kent Stainless
Dimensions	25 mm Ø with 5 mm upstand and 38 mm deep thread
Spacing	1500 mm centres along straights and 300 mm centres when changing direction
Fixing	Core drill 10 mm Ø hole to depth 45 mm filled with epoxy resin



Heritage features

Areas of historic paving and street furniture make a significant contribution to the public realm and their onging contribution to the street scene as part of any enhancement proposals should be considered carefully. When evaluating existing heritage features, the following criteria should be considered;

Key Criteria	
Condition	The material asset is still structurallly sound and provides a lasting contribution to the street or space The material asset is safe and does not provide access challenges in terms of safety, slip resistance, visual contrast as well as not being an obstacle to required movement
Contribution	Where assets reinforce a historic composition, alignment or make an aesthetically valuable contribution to the streetscene such that the retention and/or replication of the asset will extend the uniqueness of place
Historic value	This requires an assessment to determine heritage value based on the age, condition, contribution and any relevant heritage listings. This will allow for discussion of retention, potential reuse, replication or removal.

Listed Telephone Kiosk

In the case of removal of an asset, enhancement schemes should seek opportunities to re-interpret the history of a place with a modern intervention, extending the historic character in terms of proportions, detailing and composition of new material elements. Enhancements schemes within Conservation Areas or adjacent to listed buildings should be designed to take account of the specific characteristics of the area and features of these buildings.

Heritage features

Historic Purbeck stone

A range of heritage assets may be found within the surface groundplane, as unique objects of street furniture or fixed to buildings as folllows:

Historic paving materials

Surface materials such as Purbeck stone, Caithness and granite setts found throughout the City add local charm and distinctiveness to an area. Retention where possible is to be encouraged to maintain their imbued history, characterful patina, individual scale and contribution to the distinctiveness of place.

Granite cobbles

Historic Purbeck and granite

Historic street furniture elements

- Significant heritage furniture assets may include:
- Coal hole/manhole covers
- Bollards
- Edge bollards (protection from stagecoaches)
- Foot/boot scrapers
- Historic benches, kiosks and post boxes
- Traditional lampstands
- Parish markers, plaques, milestones, boundary markers (afixed to buildings)
- Drinking fountains
- Listed Telephone kiosks

Drinking fountain

Ward boundary markers

Coal hole covers

3 TREES & PLANTING

Contents

Principles for planting
Trees
Tree grilles
Tree pits
Planting and planter beds
Trellising
Watering & Irrigation

The public realm provides a number of opportunities to introduce trees, planting and other natural elements. The City of London supports schemes that seek to increase natural biodiversity, improve environmental conditions such as air quality and safeguard the contribution of the natural environment over the coming decades as climatic factors continue to change.

Whilst much emphasis is rightly placed on the significant contribution of green infrastructure to the character of the public realm within the City, successful planting that will contribute in the long term is not without its challenges. Below ground conditions, often rich in archaeology and an array of service utilities, present a considerable challenge to attaining appropriate root volumes for planting, particularly for trees. Careful tree species selection focusing on growth habit, vigour and irrigation demand is critical in achieving long term success.

This section identifies the technical requirements and considerations for successful plant selection and implementation.

4
1
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5
5

3 TREES & PLANTING

	PRINCIPLES FOR PLANTING
	Planting opportunities within the City are to be informed by the following key principles as illustrated
1	Appropriate space for root and canopy growth to be ensured around existing heritage trees retained or newly planted feature trees
2	Street tree planting at 8 m centres between avenue trees to also consider below ground archealogical and utility constraints, proximity to buildings and carriageway movement
3	Clear stem to street trees to be minimum 2.5-2.75m
4	Planting beds within natural ground are preferred to allow for successful planting and less intensive maintenance
5	Introduction of above ground planters (fixed or moveable) where protection is desired or below ground constraints determine

Trees

Trees provide many benefits in the urban environment. Their mass can not only create a balance with the density of buildings and establish an enhanced sense of place but also contribute greatly to improved air quality, biodiversity and well being. Many of the City streets are greatly enhanced by tree planting and all major public realm enhancement schemes should address the question of whether it is possible to include trees.

Key challenges include the presence of basements, tunnels, building overhangs and the proliferation of underground utility ducts and pipes in the Highway often making it very difficult to locate suitable sites for the sustainable long term growth of trees. Suitable locations for trees must also take account protected views, vehicle and building sight lines, space for the crown of the tree to develop without conflicting with buildings or high vehicles and to allow sufficient distance between the trees themselves. There is scope for planting medium or smaller sized trees in restricted locations and, in exceptional circumstances, for considering trees which are maintained at a restricted size through regular pruning. Species selection should also consider all maintenance implications associated with location, vigour and form.

As well as the limitations to the use of trees, consideration should be given to the positive use of the size, shape, form, texture, colour and seasonal interest that trees can provide, such as flowering trees and those offering striking autumnal colour.

Automated irrigation to tree pits is preferred. In cases where this is not provied, the use of 'treegators' on each tree for manual watering purposes is required.

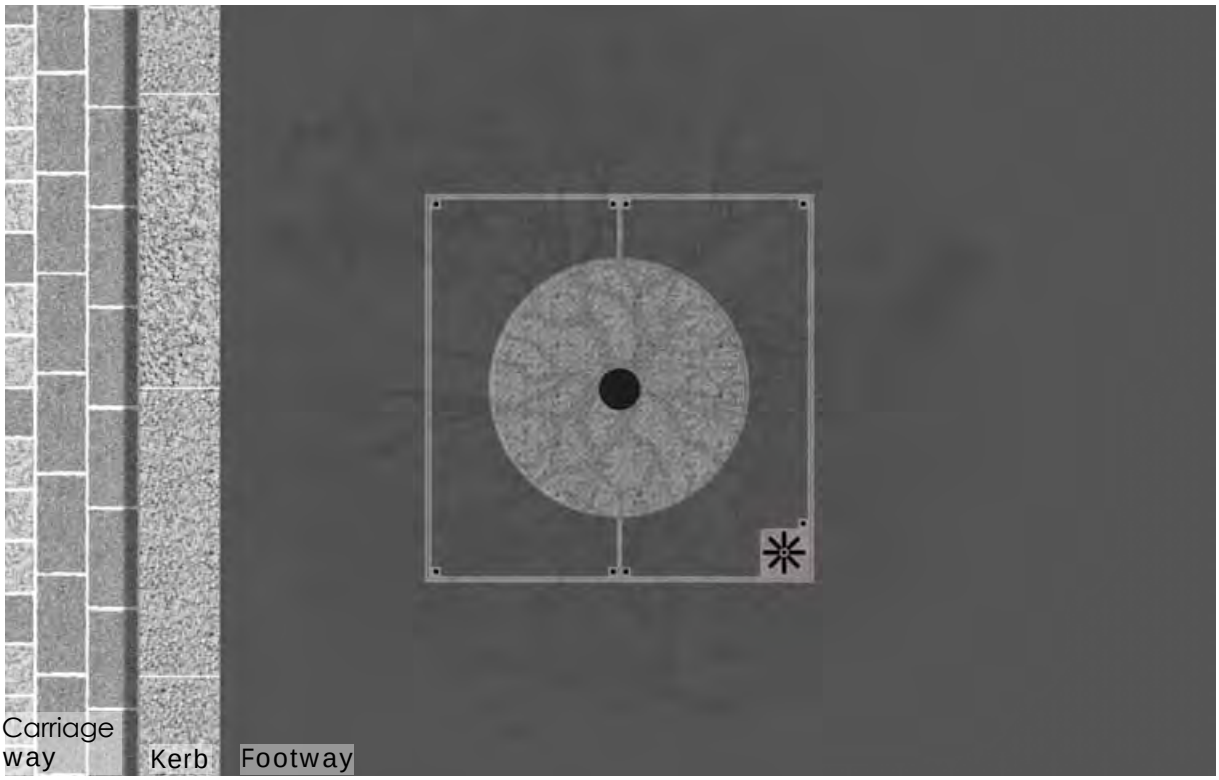
Treegators, as manual tree pit watering provision

Standard tree grille

The standard tree grille for new street tree planting is a 1206 x 1206 mm recessed steel frame. This grille is to be infilled with the two footway surfacing options of either York stone or asphalt. With the use of York stone infill, paving joints should align and continue the paving joint pattern.

The circular opening at the centre of the grille is to infilled with a porous flexi-pave material, composed of 50% recycled rubber and 50% silver grey stone aggregate. Laid flush, this infill will enable pedestrian overrun whilst allowing a flexible finish for tree trunk expansion and growth. The standard tree grille offers two removable trays for tree pit access and an integrated hinged watering point. Bespoke trees grilles may be used in exceptional circumstances to fit with the particular paving pattern of a specific location or to accommodate large existing trees.

Illustrative plan with asphalt surrounds

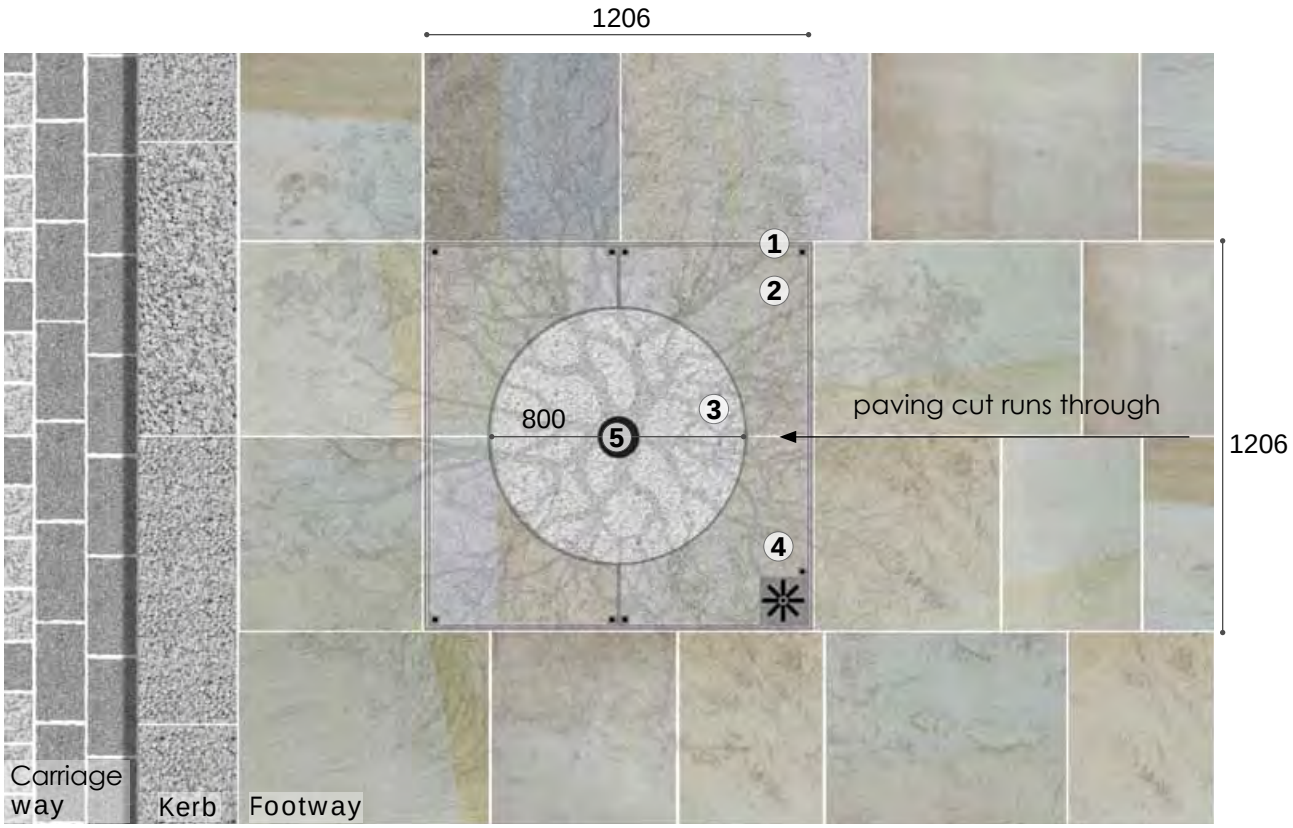


Standard tree grille

Key Criteria	Recessed cover with York stone infill
Product	Urban Forest Tree Surround (twin tray)
Supplier	SFH Maintenance Ltd
Dimensions	1206 x 1206 mm with 800 mm Ø circular opening
Finish	Hot dipped galvanised
Circular opening infill	KBI Flexi-pave colour 'London Grey'

Illustrative plan and section

1. Recessed steel frame
2. York stone infill paving
3. Flexi-pave porous infill
4. Watering point with hinged self closing cover
5. Tree trunk



Tree surround for existing trees

A flexible surfacing of recycled rubber granules and stone aggregate is to be used as porous infill to recessed tree grilles and around the base of existing street trees. Poured flush with adjacent surfaces, this infill not only provides a continuity of footway surfacing but also assists in sustainable urban drainage infiltration. The Flexi-pave material has been developed to compliment the granite and York stone materials palette.

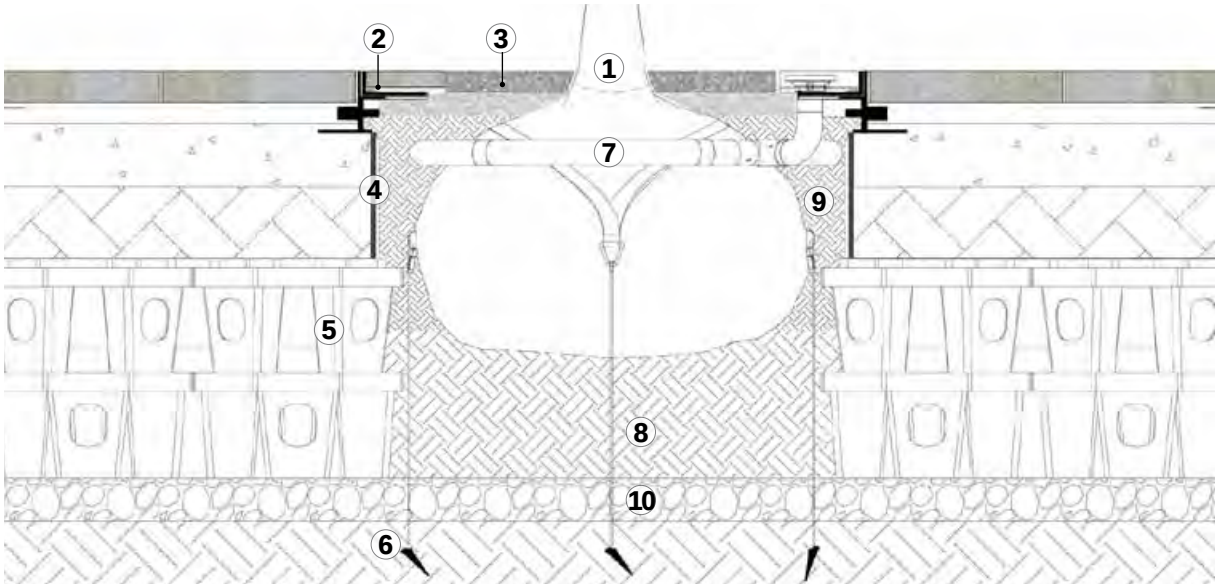
Key Criteria	
Product	KBI Flexi-pave 3-6 mm granule
Supplier	KBI UK Ltd
Colour	London Grey
Thickness	50 mm thick laid on 50mm porous stone base to make up levels

1. Flexi-pave
2. Yorkstone paving
3. Granite kerb

Standard tree pit construction

The standard detail for newly planted trees should utilise the following components, composition of which may be varied in proportion to suit the specific requirements of tree planting location. Tree pit depth should be a minimum of 800m, ideallly to provide 1 cubic metre of substrate.

Key Components		
Tree planting	1	Newly planted tree to be planted level with nursery line
Tree surround	2	Tree surround with inlaid paving material
Infill material	3	Flexi-pave porous infill on porous stone base to make up levels
Root barrier	4	Root barrier where necessary in consultation with Open Spaces
Structural soil cells	5	Stratacell, or similar approved in consultation with the Open Spaces Department, to maximise width and depth of supported root zone infilled with topsoil (BS 3882 sandy loam)
Stabilisation	6	Subsurface guying to deadmen or ground anchors
Irrigation and aeration	7	60 mm Ø irrigation and aeration pipe immediately around the rootball linked to grille inset hinged watering point cover
Structural soil substrate	8	Rootball supported on structural tree soil
Soil substrate	9	Imported topsoil to BS 3882 (sandy loam)
Drainage layer	10	100 mm drainage layer of clean gravel beneath geonett membrane



Planting and planter beds

Careful choice of plants and planting elements can greatly enliven and soften the built environment. They can bring colour and seasonal interest as well as providing green structure and form within the public realm.

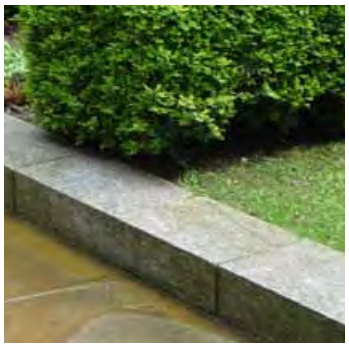
The elements that are used are many and varied including formal hedges, informal shrub planting, colourful perennial planting including grasses, climbing plants, seasonal bedding plants and lawn areas.

All areas which are planted should include automatic irrigation if possible. Consideration should be given at an early stage as to how this is to be achieved. The availability of an adjacent water source is vital for all planted areas. Increasingly, the incorporation of planting beds as an integral part of the sustainable urban drainage system is to be encouraged where ground conditions permit. Plant species are to be carefully selected to respond to climatic and seasonal fluctuations balanced with strong visual aesthetics and biodiverse considerations.

The detailed design and choice of plants should be developed in consultation with the Open Spaces Department.

In ground planting beds

Narrow granite edging



Wide granite edging

The preferred approach to implementing long lasting planting schemes is to establish at grade planting in the form of low retained planting beds. Such beds support the ability for plant roots to extend into natural ground conditions, to establish good drainage conditions and allow ease of access for maintenance to the benefit and vitality of the planting.

Planting beds are to be retained by a low raised natural stone kerb of either granite or York stone to reduce litter collection demands and protect planting from pedestrian overrun.

Minimum topsoil depths and soil composition for planting within ground level beds are subject to the specification or approval of the Open Spaces Department.

Key Criteria	Minimum topsoil depths required
Lawn	300 mm
General planting	450 mm
Large shurbs	up to 700 mm
Small trees	up to 1000 mm

York stone edging as upstand to planter bed

Raised fixed planters

Raised beds have been used to bring plants into the City street scene. They provide a means of getting trees and vegetation of impact into areas where there is not a significant soil depth otherwise available. These fixed structures can provide high quality architectural and sculptural elements in themselves and often incorporate seating elements. Raised planters are generally constructed as either clad or solid stone structures and in a number of finishes appropriate to their setting.

Raised planters should have adequate drainage with consideration given to the sub-base and its drainage capability. Raised beds are to be filled to the specification or approval of the Open Spaces Department. Automatic irrigation should be included in permanent planters to reduce maintenance costs.

The volume of soil provided within fixed planters will determine the most suitable plant species to be grown for long term impact, vigour and reduced maintenance demands.

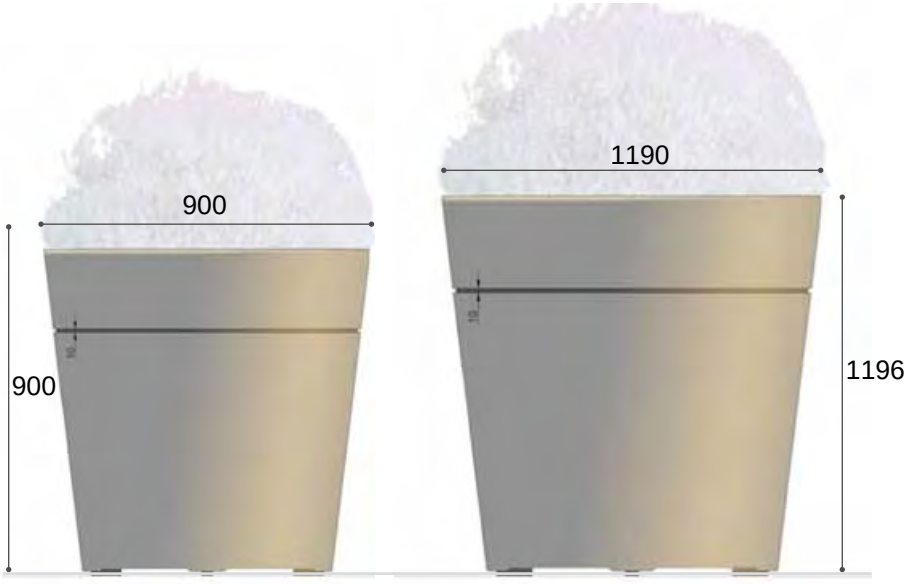
Mobile planters

Mobile planters are principally used to demarcate entrances and thresholds to key buildings and spaces, extending the history of using lead cisterns in similar locations around the City. They may also be used to introduce temporary greenery where the proximity of underground services or access requirements restrict the creation of permanent planting beds.

As a miniumum within each planter, a drainage layer of Lightweight Expanded Aggregate (LECA 4-10mm round) over the drainage holes and a filter membrane material such as Terram 1000 or equivalent should be installed to prevent fine soil particles from washing out on to the paving. The appropriate soil mix, planting species and irrigation demand is to developed in consultation with the Open Spaces Department.

A simple, cone shaped, bronze design is the preferred planter within the City, offering two different planter capacities.

Key Criteria	Small solid bronze planter	Large bronze clad planter
Style	Cone shaped planter	Cone shaped planter
Supplier	refer to City Public Realm	IOTA
Dimensions	900mm high	1196mm high
Diameter	Top 900mm	Top 1190mm / Bottom 990mm
Construction/Finish	Solid bronze	3mm thick Zintec Steel, clad with 1.2mm Bronze

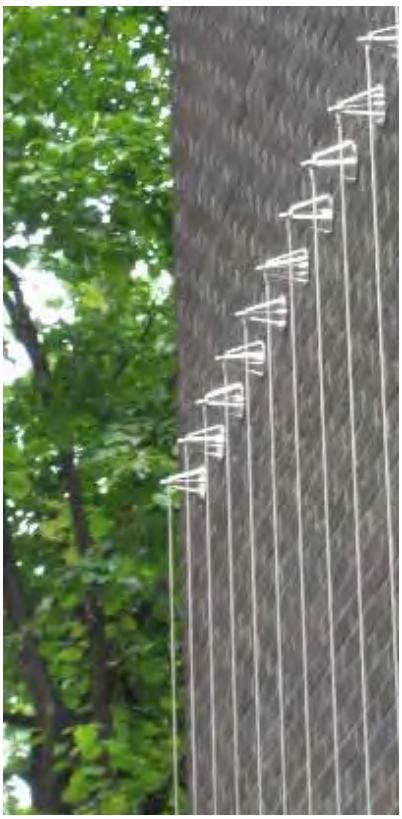


Trellising

A trellis can provide an attractive vertical display of plants where trees would not be appropriate. A stainless steel wire system, installed vertically, provides a low maintenance strong support for a range of twining climbers. This should be appropriately specified according to the height of trellis, location, plant loading and risk of vandalism or abuse.

For ease of maintenance and access, trellises should generally not exceed 2.5m in height otherwise mechanical lifting equipment will be needed to maintain. Consideration must be given to width of planting bed at the foot of the trellising also affecting means of access for maintenance and inspection.

Key Criteria	
Supplier	Jakob® INOX LINE or equivalent.
Material	Stainless steel wire
Wire dimensions	4 mm

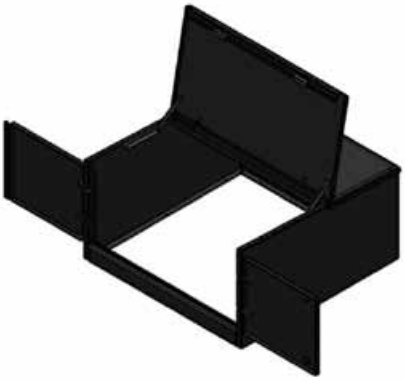


Watering and irrigation

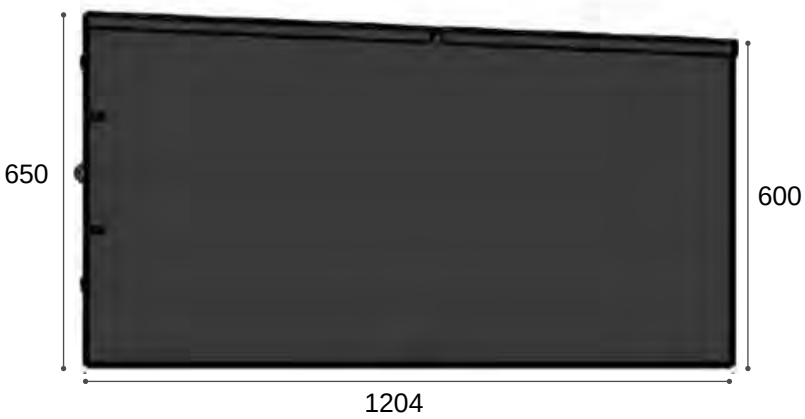
Irrigation cabinet

Planting schemes within the City are managed by City of London Open Spaces Department. Irrigation requirements for such schemes include the provision of an above ground irrigation cabinet, associated drip feed surface laid pipe network and in the case of larger planting schemes, the provision of standpipes. The irrigation cabinet should be IP rated, located adjacent to hardstanding for ease of access and sit above a below ground brick built chamber of 1m³ in volume. Note: cabinet proportions may vary subject to location.

Key Criteria	
Product	Irrigation cabinet
Supplier	Fountaineers Ltd
Dimensions	1204 x 1204 x 650mm (minimum 600mm above ground) Minimum internal width to be 1000mm
Appearance	Galvanised steel, Black painted steel
System requirements	Any connection to the mains must be installed with a double non-return check value as approved by the Water Regulations Advisory Scheme (WRAS) Overflow pipe – Ø 20mm polypropylene (any colour) through Ø 25mm hole in cabinet with pipe exit above ground to meet Thames Water Regulations Concrete base of 100mm thickness with 2 drainage holes at Ø50mm each.



Cabinet opening



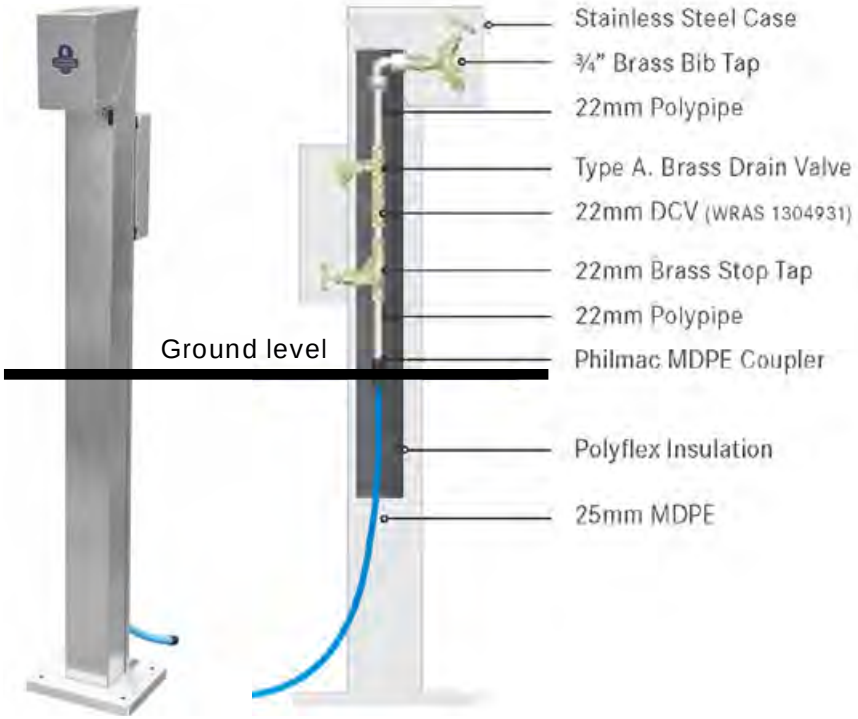
Cabinet section above ground

Watering and irrigation

Standpipes

On certain projects, standpipes for hose connection are to be installed as back-up to automatic irrigation. The requirement for standpipes are detemined by site location, spatial demands, access and other constraints in consultation with the Open Spaces Department. These standpipes are to be located sensively within the planting scheme, with consideration given to ease of access and extent of hosepipe connection to avoid crossing of pedestrian routes.

Key Criteria	
Product	Tower standpipe with 3/4 bib tap
Supplier	Edwards Standpipes
Material	Stainless Steel Grade 304 – 1.5mm thick
Dimensions	106 x 106 x1470mm (720mm above ground, 750mm below ground)
Fixing	Stabilsing base plate 255 x 255mm



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