

Public Realm Surface Materials Code : Nine Elms on the South Bank

for

THE PUBLIC REALM
WORKING GROUP



Camlins

Report Reference:
LL453/R/001
Rev I

Foreword

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FOREWORD

Purpose of the Public Realm Design Baseline

This report aims to provide clear design guidance to those implementing public realm, whether public funded environmental improvements or public spaces delivered as part of development. It categorises the streets and spaces. Although it does not include construction details, it gives appropriate detail on how the various recommended surfacing materials can be employed successfully. It is intended that this guidance applies to schemes in both public and private ownership - i.e. in adopted and non-adopted areas. It shows how these elements come together to form typical street types and junctions. Adherence to these recommendations by public realm designers of individual schemes will produce incrementally a piece of cityscape which is historically responsive, elegant, safe, enjoyable and practical to maintain.

Interpretation of Recommendations

This report makes clear recommendations regarding many aspects of public realm design, sufficient to set a quality benchmark for public realm implementation teams. Beyond that, the proposals are not prescriptive. The design team for each scheme will interpret these recommendations, alongside all other appropriate design guidance, but will retain design responsibility for all aspects, including highway alignment, traffic issues and structural design. It is important that these proposals are applied consistently over the future build out period, across the whole of Nine Elms on the Southbank and throughout the different types of development and environmental enhancement projects. Therefore it is recommended that the contributing parties of the PRWG identify a multidisciplinary officer panel to work with the design codes and comment on schemes at appropriate stages in their approval process.

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Street code ⁴⁴⁻⁵⁵

Stone selection ⁵⁶⁻⁶⁶

Technical guide ⁶⁶⁻¹²¹

Maintenance ¹²²⁻¹²⁵



How To Use This Public Realm Surface Materials Code:

01/



Step 01/ Establish your Character Area...

Firstly one must determine what character area the site in question falls into, Nine Elms, Vauxhall Cross or Albert Embankment

02/



Step 02/ Understand Design Ambition...

The next step is to understand the design ambition outlined in the following report. This will give you an understanding of the overall quality and design ambition for the area.

03/



Step 03/ Know your Streets...

Having understood the design ambition the next step is to determine where the space within the Street Code matrix of Main Streets, Side Streets and Pedestrian Spaces.

04/



Step 04/ Select your Stone...

The next step requires the specific selection of the stone. A palette has been created for you to choose from determined by both the character area and street typology of your space.

05/



Step 05/ Comply with Standards...

Now that the stone has been selected the Technical Guide must be followed to ensure the durability and compliance of the scheme to various standards.

06/



Step 06/ Long Term Requirements ...

Finally it is important to understand the long term maintenance requirements of the selected stone in order to comply to various standards.

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1.4 PRECEDENTS

1.4.1 Truro, Cornwall

1.4.2 Tower Hill London

1.4.3 Florence Streets, Italy

1.4.4 Earth Sciences Building, Oxford University

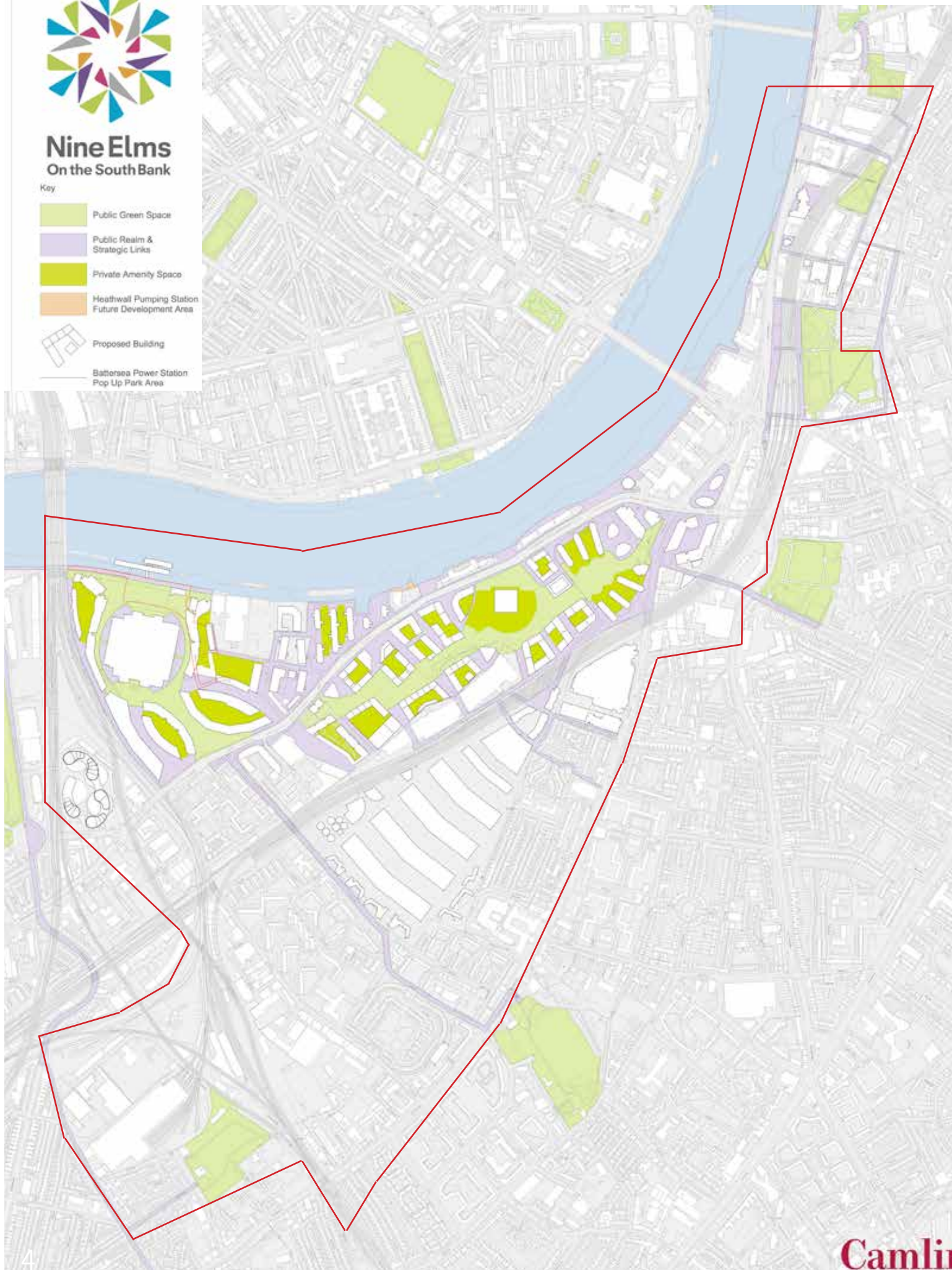
1.4.5 Southwark Street, London



Nine Elms On the South Bank

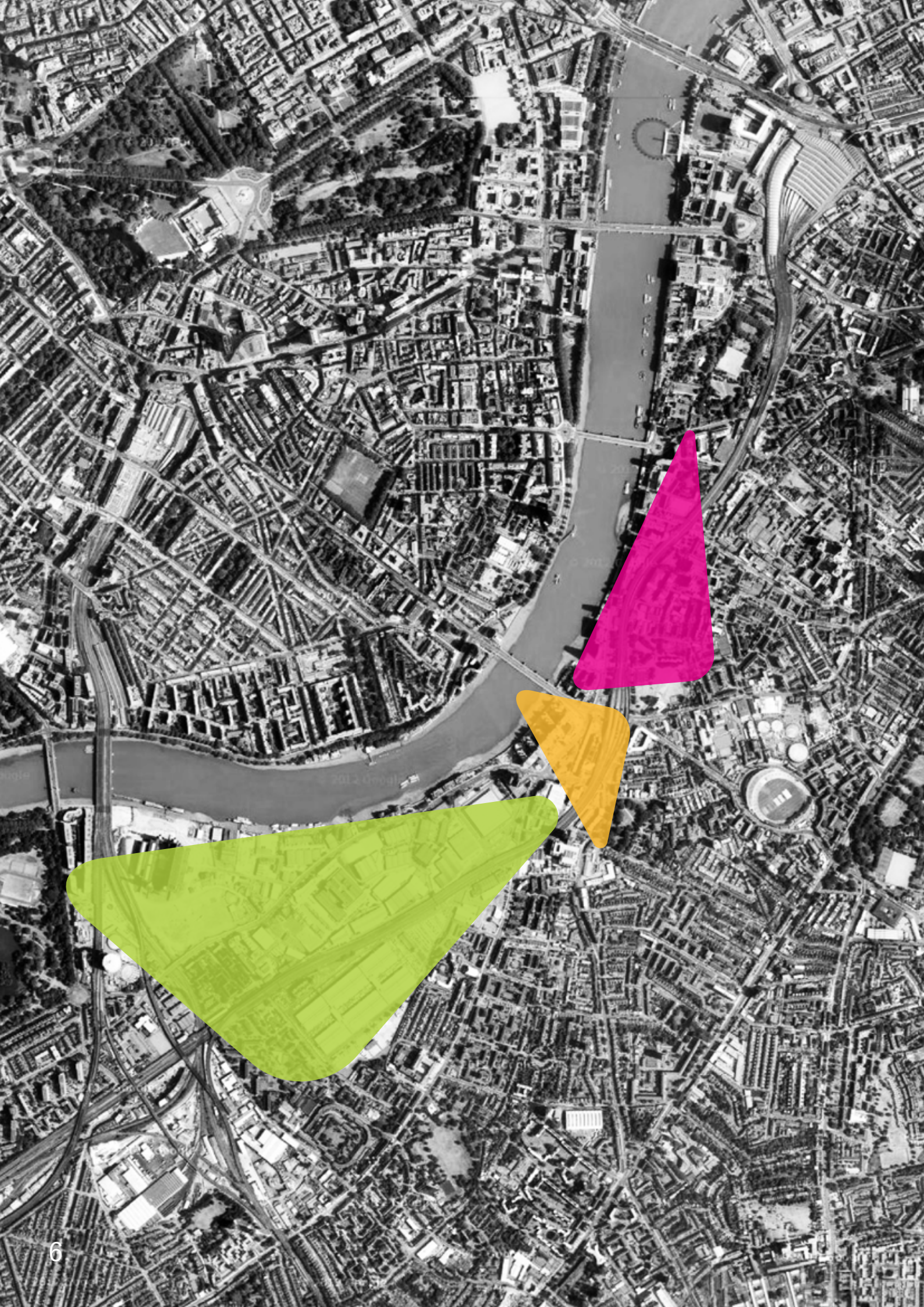
Key

-  Public Green Space
-  Public Realm & Strategic Links
-  Private Amenity Space
-  Heathwall Pumping Station
Future Development Area
-  Proposed Building
-  Battersea Power Station
Pop Up Park Area



1.1 PUBLIC REALM PLAN





1.2 KEY AREAS

Nine Elms

The southern area of the opportunity area stretching from Battersea Park and Chelsea Bridge to the Vauxhall gyratory, including the historic remnant of the power station, covent garden market and the new US embassy. Dominated by the new linear park it will contain a series of identifiable public neighbourhoods all held together by a high quality, unified streetscape

Vauxhall Cross

Forms the area around and including the gyratory, Vauxhall tube and railway and bus stations, the focal point for a modern high rise explosion

The railway arches, so long a barrier, will be brought to life to provide space for new business, community and cultural uses, as well as being opened up to allow for footpaths and cycleways.

Albert Embankment

The northern area of the opportunity area stretching approximately one mile from Vauxhall Bridge to Westminster Bridge and Lambeth Palace

The river embankment created by the engineer Sir Joseph Bazalgette for the Metropolitan Board of Works between July 1866 and November 1869, and the historic neighbourhoods of Old Paradise Street, Black Prince Road and Vauxhall Pleasure Gardens along with the railway arches set a distinct heritage feel.



1.3 CHOICE CRITERIA

1.3.1 CULTURAL CONNECTIONS

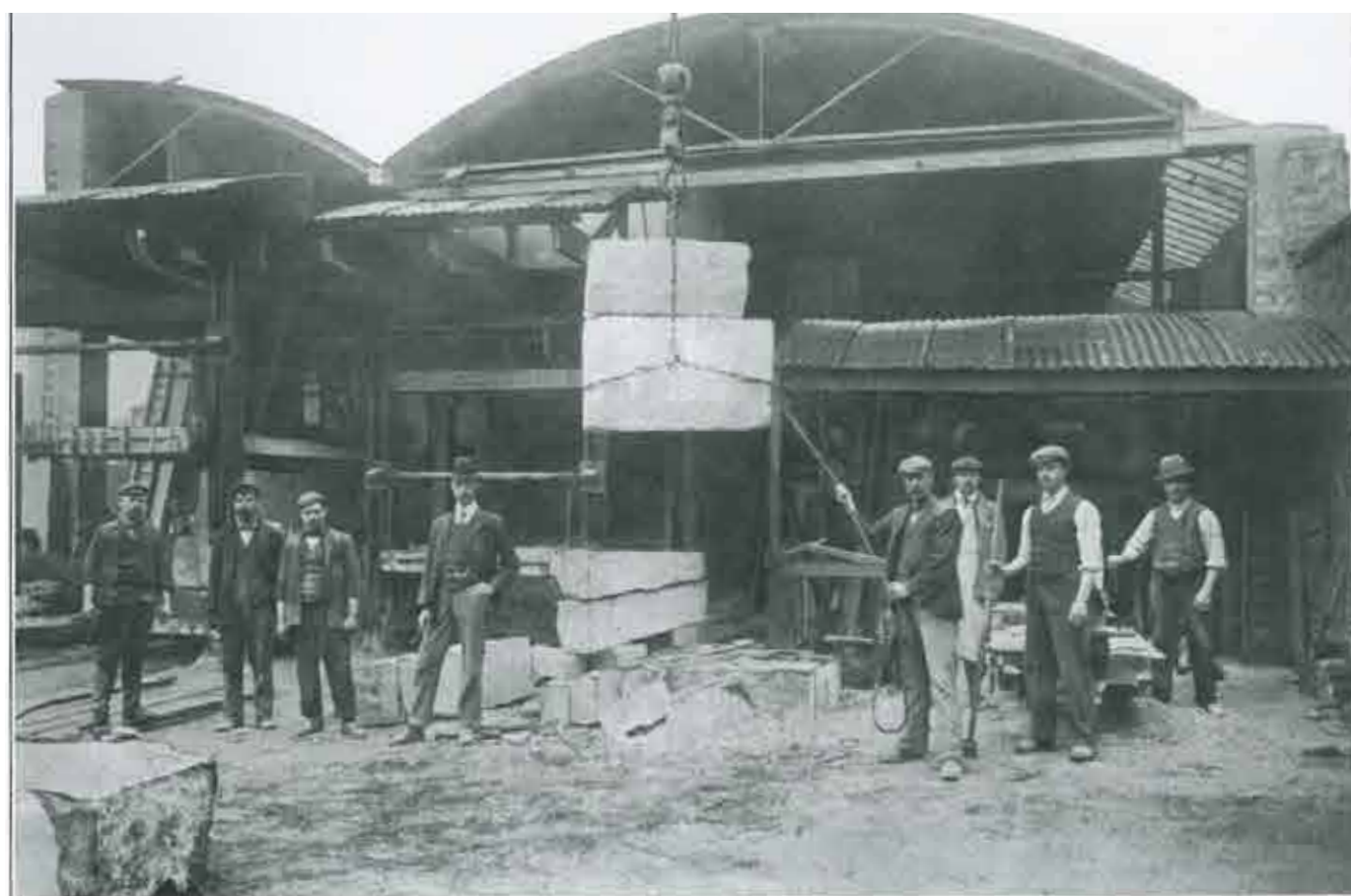
The Nine Elms on the Southbank area has a richly layered history with a variety of cultural connections linked to materials, manufacturing, trade and settlement. x and varied identity and cultural history that may help inform the future. This may inform and shape, it may add values and it may suggest materiality of a past and future society but in a considered manner without burdening a viable future scenario.

Lambeth was renowned as the home of the great plant hunters and collectors, Tradescant the Elder and Younger, along with more recent manufacturing of glass and ceramics.

Nine Elms and Battersea have thrown up historic celtic finds, enameling schools, manufacturing of all descriptions utilizing the tidal Thames and probably most famous for producing gas and power for the city.

It was the birthplace of the eminent industrialist Isaac Charles Johnson (1811-1911) who discovered the sintering process, still used today to produce modern day Portland cement. Home to mills, wharfs, rail and stone yards it was a major importer, processor and exporter for London.

All these characteristics and elements may have a valid role to play in the future procurement and manufacture of the public realm, parklands and gardens, here we outline the key elements that should be considered.



STONE



Traditionally stone has been the most common surfacing material for footways, giving durability and robustness with ever increasing demands. There have been many variations to the stone selection over time dependent on distance to site, cost etc, but all with one thing in common - a natural wearing finish that stands the test of time.

Forest Of Dean Sandstone

From 1910 onwards United Stone Firms Ltd formerly of Bristol acquired a number of stone yards and wharfs within Chelsea and Wandsworth as key distribution and cutting centres for the import of their raw material from their quarries around the British Isles and Ireland.



Of note were the Crown Wharf and Chelsea Wharf at Lots Road and of particular interest to Nine Elms is the Stewarts Road Works and Midland Railway Wharf, Wandsworth Road.

There were many stone quarries incorporated under the United umbrella supplying from Portland, Cornwall and the Welsh and Irish Coasts via cargo ship up the Thames. Today only the Forest of Dean Works remain within the company as a viable supply source for architectural stone and durable sandstone paving.



Portland Stone

Nine Elms Railway Goods yard was the centre of imports for London from the south west of England. Milk, vegetables, stone and many forms of goods passed through.

FJ Barnes who owned a quarry at Portland had opened a London depot and office on Nine Elms Lane allowing direct import from Weymouth into London for trade.

Mr Barnes quarrying and Stone business was the second largest on the Island, ranking next to Bath Stone Firms Ltd. The business had incorporated the quarries of the Portland Stone Co Ltd (acquired Jan 1889 and the works of the Stone Working and Quarrying Co. Ltd. (purchased Sept., 1891).

Yorkstone

Yorkstone has been traditionally used along the Albert Embankment and surrounding conservation areas.

Traditional stone paving or cobbled surfaces combined with numerous original granite kerbs contribute to the character.

Highlights of interest include numerous coal holes in the pavements (with elaborate manhole covers).



Cornish granites

De Lank Quarry, near St. Breward on north-west Bodmin Moor, is the most famous of all the Cornish granite quarries and is still active after over 150 years. It is noted for its silver-grey even grained granite and has furnished large blocks for works such as Eddystone (1878-82), Beachy Head (1900) and Bishop Rock Lighthouses, Putney Bridge and Hull Docks.

The LSWR forged links directly through to the west country connecting Devon and Cornwall with Nine Elms London. Granite would have been shipped in via the Thames or direct via rail.

The history of architecture in Britain has literally been built with granite and De Lank has been attracting and inspiring the country's finest masons and architects for centuries. The list of buildings and monuments that have incorporated Silver Grey Granite reflects the greatest and very best and can be found in many of London's most iconic structures and buildings including The Queen Mother Memorial; Trafalgar Square; The Princess Diana Memorial Fountain; The Royal Opera House; New Scotland Yard; Tower Bridge; The Royal Academy; Monuments to Churchill and Marx, amongst others The Seed at the Eden Project.

De Lank granite is available in a number of finishes: Fine Axed for shaped and carved work; Honed for cladding and masonry; Polished for decorative cladding; Hand Punched for kerbs, quoins, lintels and memorials; Diamond Cut for masons; Dolly Pointed for street kerbs and heavy duty paving; Flame Textured for paving and hard landscape.



CONCRETE

Born at Vauxhall, London Johnson's father was a charge-hand at Francis & White's "Roman Cement" plant in Nine Elms. He worked there himself as a labourer from the age of 16 while studying chemistry.

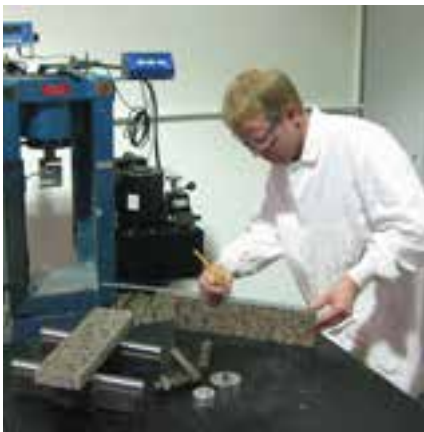
In 1833 he became manager of John Bazeley White's cement plant at Swanscombe further along the Thames Estuary.

Isaac Charles Johnson set out to discover James Aspdin's carefully guarded secret for the production of early day cement and in the process accidentally over-fired some clay-bearing limestone past the point where it was transformed into clinker. The clinker was considered worthless and most of it was thrown away, but Johnson ground some and immersed it in water and was amazed to find the resulting material was actually harder than Aspdin's hydraulic mortar.

This process is still used today producing modern day Portland cement.

Taking Johnsons lead we may consider the next development in the use of concrete in the public realm. The replacement of raw aggregates and fully processed portland cement with secondary and recycled content all sourced in the UK is now achievable and should be considered as a viable replacement to imported stones.

a more sustainable way, with high recycled content and low embodied carbon including ground granulated blast-furnace slag (GGBS) as a cement replacement sourced from the UK – local, responsible sourcing being a key element of the sustainability objectives.



1.3.2 PHYSICAL QUALITIES

It is intended that this document be used to determine the specification of materials for schemes in adopted and non-adopted areas of Nine Elms on the South Bank. As such, the approving authorities, namely Transport for London, London Borough Wandsworth and London Borough Lambeth, will be reviewing submissions to ensure that materials meet the minimum standards in robustness, durability, sustainable supply, and colour as set out by this guide.

Materials for use in the public realm are required to meet the following test properties which then comply with minimum British Standards:

Water absorption (BS EN 13755:2008)

Unpolished Slip resistance (PSV) (BS EN 1341:2012), minimum 40.

Flexural Strength (BS EN 12372:2006)

Compressive Strength (BS EN 12371:2010)

Wheel Abrasion resistance (BS EN 1341:2012)

Freeze / Thaw (BS EN 12371:2010)

Also materials must meet

Flags: BS EN 1341 2012;

Setts: BS EN 1342 2012;

Kerbs: BS EN 1343: 2012.

Technical surfacing details and layouts are provided to demonstrate the buildability and co-ordination of the materials selected to create functional, high quality, low maintenance, pedestrian friendly public realm.

Diagram illustrating the TfL adopted streetscape



Diagram illustrating the extent of Wandsworth jurisdiction..



Diagram illustrating the extent of Lambeth jurisdiction.



1.3.3 ADOPTABILITY

The Baseline Palette will apply to non-adopted as well as adopted streets, in order to achieve continuity and coherence to the streetscape in the area.

TfL

TfL's highway policy utilises a standard palette of materials. Developers are encouraged to adhere to the advice set out in TfL's Streetscape Guidance and this code. However, developers can propose to use material outside of this palette, which will be considered by the relevant department and if necessary be decided upon via the appropriate approval panel/board.

Whether or not TfL approve an item outside the palette of materials; TfL may charge a commuted sum for assets which have been agreed to be adopted to cover maintenance liability costs. TfL will enter into a dialogue with the promoter to discuss the proposal. The commuted sum(s) will be calculated on the methodology prescribed in the County Surveyors Society, now ADEPT, Commuted sums for maintaining infrastructure assets. TfL will approve the scope of the items covered for calculating the commuted sums (including the rates and quantities used).

Wandsworth

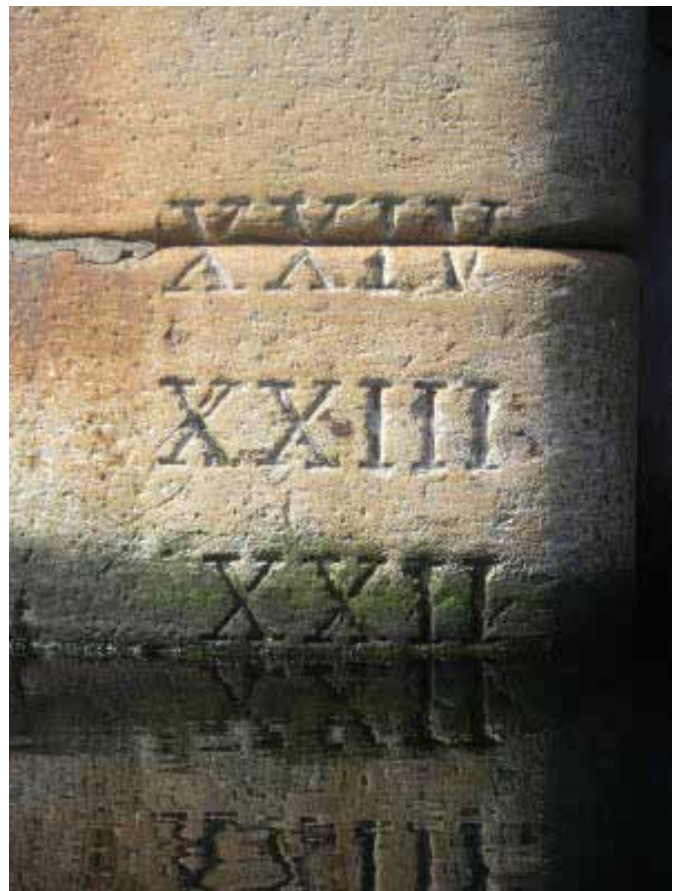
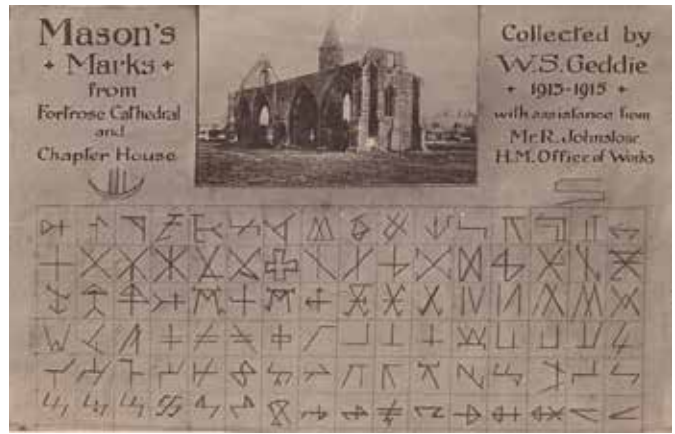
Wandsworth Council are happy to support the use of high quality and durable materials in the Nine Elms public realm and are willing to adopt street furniture and paving materials provided they have been approved in advance by our highways team. Some degree of standardisation throughout the area, especially regarding street furniture, will be essential.

In order to fulfil this aspiration commuted sums from developers will be required which will be calculated in an equitable manner in line with accepted good practice and agreed Council Policy (based on guidance from the County Surveyors Society, now ADEPT) to ensure adopted paved areas can be maintained to a high standard and at no additional cost to the Council over basic materials.

Lambeth

Lambeth Council are happy to support the use of high quality and durable materials in the Nine Elms public realm and are willing to adopt street furniture and paving materials provided they have been approved in advance by our highways team. Some degree of standardisation throughout the area, especially regarding street furniture, will be essential.

In order to fulfil this aspiration commuted sums from developers will be required which will be calculated in an equitable manner in line with accepted good practice and agreed Council Policy (based on guidance from the County Surveyors Society, now ADEPT) to ensure adopted paved areas can be maintained to a high standard and at no additional cost to the Council over basic materials. The Council needs to keep this approach under review as it may be impacted upon by savings required in future years.



1.3.4 THE EFFECTS OF TIME & IMPLEMENTATION



Continuity and consistency

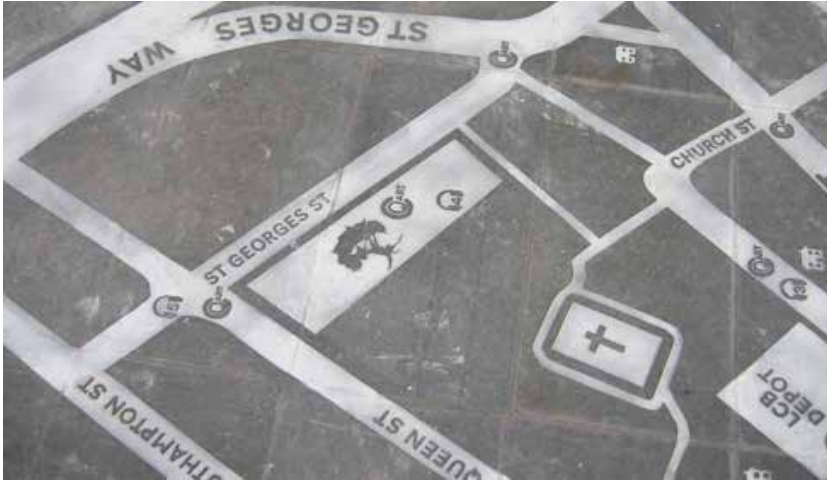
Public realm works will be implemented across a wide area and for a time period currently predicted to over 15 years. A key requirement of the material choice is to provide a palette that will provide continuity of appearance across phases, retain their inherent qualities and age with grace. In theory and most likely in practice one development or public works phase may take place many years after its neighbour or adjacent works. Careful material selection, implementation and reinstatement process can help to avoid this juxtaposition looking uncomfortable and out of character and place. Coloured concrete mixes and other products using coloured binders and dyes are prone to fading and do not age well. On the other hand, natural stone, particularly granite and durable sandstones, tend to age with dignity, and can even look better with age.

Phasing

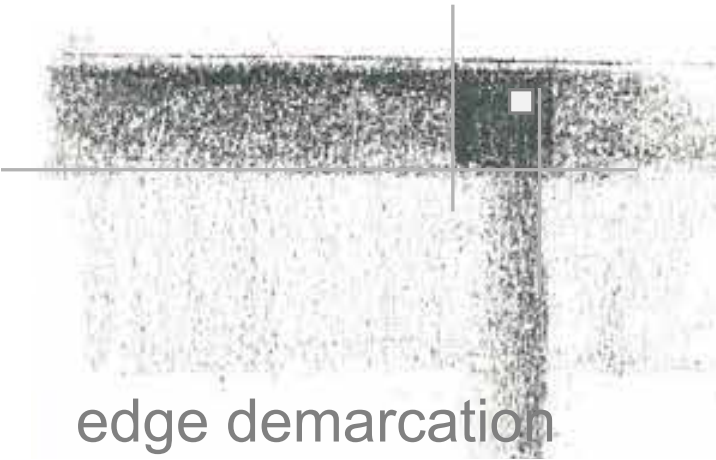
Careful detailing of stones and a planned termination scenario between phases and street sections will provide a strong visual marker and clean edge to the end of the one set of works, and the start of the next phase. A special detail for the termination of footway details is suggested in Section 4.1.19. A special stone piece with roman numeral numbers for the date of completion, terminates the latest phase. It makes a clean edge to a phase so that the adjacent paving, which will have the possibility of being a slightly different granite, will juxtapose confidently.

Fashionless

This Baseline Palette of materials needs to provide an unobtrusive background to the diversity and vibrance of modern architecture and public realm activities and to the range of building materials. It needs to be 'fashionless', i.e. have a timeless quality that does not go in or out of fashion.



sandblasted granite



edge demarcation



marker

1.3.5 SUSTAINABILITY

It is important that the material selection process for the Baseline Palette recognises the social and environmental impacts of the material in question. The Olympic precedent has set new targets for sustainable procurement and construction in London and the UK. The four material targets, which focused on responsible sourcing, embodied impacts, healthy materials and recycled content, together with a planning requirement to deliver a minimum of 50 per cent of materials to site by sustainable means, had a major bearing on the selection, sourcing and supply chain. This document focuses on the surface materials finish and clearly sets the benchmark, but should not forget the whole slab or pavement construction including excavated materials, imported or site won secondary and recycled aggregates for sub bases and concrete including bedding and jointing mortars form a major part of the story or impact. As noted from the Olympic experience, delivery to and from site is often a significant factor in the material impact and any alternatives to standard road transport shall be considered.

A Base Guide

The BRE Green Guide to Specification Code assesses a range of materials and constructions according to criteria, and gives each combination a Code rating A-E.

Criteria used in the Code classification include:

- Climate change
- Water extraction
- atmospheric ozone depletion
- toxicity to land
- acidification
- CO2 production
- human toxicity
- mineral resource extraction
- fossil fuel depletion

1.3.6 COMPLIANCE WITH BEST PRACTICE & BRITISH STANDARDS

All materials and their compilation into technical layouts must comply with relevant British Standards and best practice guidance to ensure accessible public realm.

BS8300:2009 and A1:2010 section 5.5 refers to Footway and Footpath Surfaces which specifies surface materials to be avoided, gradients required, surface finishes required, and stipulates hazard protection measures.

Guidance from the following documents has also been referred to in the selection of materials and best practice specifications:

- Department of Transport New Roads and Streetworks Act 1991.
- TFL Streetscape Guidance (2009)
- Improving Walkability (2005)
- Walking Good Practice (2012).
- Commission for Architecture and the Built Environment Paving the Way 2002.
- TfL Nine Elms Lane Design: Public Realm Design, Burns & Nice, 2012.
- Better Streets, 2009. GLA.
- VNEB OAPF Consultation Draft 2009.
- London Borough of Wandsworth Core Strategy. Adopted. Oct 2010.

COLOUR TONE
WARM TO COOL



CONTRAST WITHIN STONE
HIGH TO LOW



CONTRAST WITHIN MIX
HIGH TO LOW



1.3.7 AESTHETIC QUALITIES

In the determination of materials for the Stone Control Panels the following visual and aesthetic characteristics of the stone are assessed, as well as their physical, petrographic properties (which are intrinsically linked).

In submitting a surface material for approval to the relevant Local Authority these characteristics need to be stated and to meet those of the relevant Stone Control Panel (selected by location of the proposed development's Character Area):

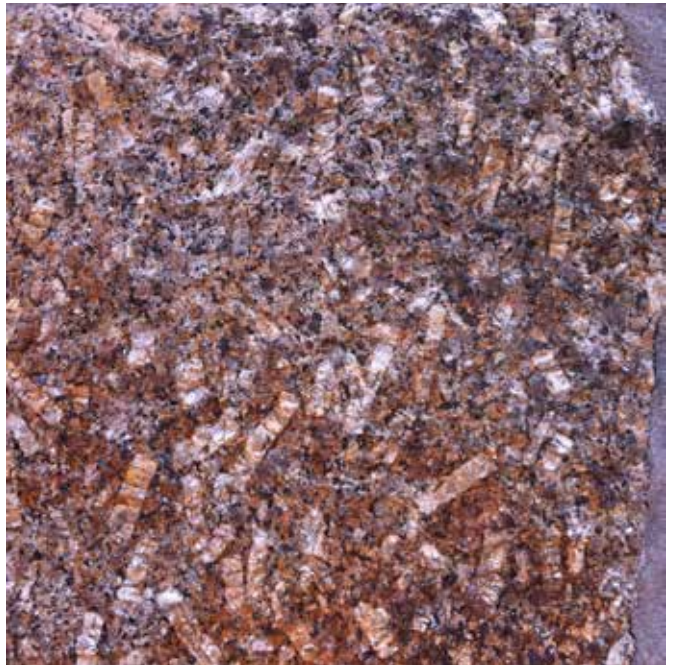
- Colour tone of individual stones
- Level of contrast within the stone type
- Stone mix and level of contrast within that mix.
- Size and scale of proposed surface.
- Texture + finish of individual stone surfaces and sides. .



1.4 PRECEDENTS

Precedent examples have been chosen to demonstrate the variety of qualities that are essential to long lasting, durable and robust public streets that form a simple and base backdrop to architectural form and diverse and colourful urban life.

Key elements that have been reviewed include stone type, its origin, scale, coursing, and laying patterns, laying construction and grout finish, and particular feature elements to each scheme or place.



1.4.1 TRURO, CORNWALL



An aged streetscape that has formed a durable backdrop to urban life and settlement for many years

- Stone : GRANITE
- Origin : local Cornish / British
- Mix of pedestrian footways and shared surface squares
- Footways of varied coursing [300-450mm] with long random format flags
- Irregular staggered bonding and finish with aged and very rounded edges
- Subtle colour variation within individual stones give interest and a surprising warmth to mainly cool colours [variation in local granite seams]
- Scale and thickness of material establishes and exhibits a quality and strength to the floorscape
- Setts [150mm coursed] with wider colour variation used within shared surface square
- Laying/grouting : mixed historic flexible construction with granular grout and modern rigid construction with neutral grey grout
- Reuse – has been laid and relaid many times, repairable and sustainable
- Feature elements -
 Cast drainage detailing with intricate patternation
 Large format corner stones
 Full footway width very long flags
 Deeply carved channels and high upstand kerbs





1.4.2 TOWER HILL, LONDON

A modern and contemporary piece of urban realm in an extremely historic setting

- Stone: GRANITE
- Origin: France
- Pedestrian square with limited vehicular access
- Large format flag with sharp sawn edge
- Geometrically aligned with a stack or grid bond
- Textural contrast in surface finishes [cropped and flame textured]
- Clear geometric organisation
- Very high quality laid finish
- A cool colour palette but not cold in conjunction with warm historic structures
- works well as backdrop to warmer historic structures
- Laying/grouting : rigid construction with screed grout in neutral grey
- Feature elements -
 - Strong linear bands through cropped setts
 - Large stone benches with integrated lighting fins
 - Well crafted ribbed tactiles



1.4.3 FLORENCE STREETS, ITALY

An aged and classic streetscape, that has formed the backdrop to a rich shared city scene for centuries, aged with grace

- Stone : Sandstone Pietra Serena 'Florentina'
- Origin : local Firenzuola / Italian
- Shared access streets
- Bold directional pattern and scale in large herringbone format
- varied coursing [300-450mm] with random length flags
- Irregular staggered bonding and finish with aged and slightly rounded edges
- uniform blue/ grey colour, medium to dark base to diverse colourful buildings
- Laying/grouting : mixed historic flexible construction with granular grout and modern rigid constructions
- Reuse – has been laid and relaid many times, repairable and sustainable
- Feature elements -
Wide strong channels and cast gullies with low upstand kerbs
- active and colourful street dining paraphernalia





1.4.4 EARTH SCIENCES BUILDING, OXFORD UNIVERSITY

A modern and contemporary use of Portuguese granites within a private public realm. First packages of work done by the Estates Directorate in Oxford and is used as benchmark for other colleges.

- Stone: GRANITE
- Origin: Portuguese/european origin
- Shared access streetscape
- varied coursing [300-600mm] with medium length random format flags
- Irregular staggered bond finish with crisp sawn edges and fine picked finish
- A mix of two colours tones of beige/ grey and yellow create variation and give interest and warmth
- Variation in laying pattern subtly highlights vehicle flow
- Laying/grouting : rigid construction with screed grout in neutral grey, has been cleaned and sealed
- Feature elements -
bold Inset lighting
Cut stone benches in contrasting colour



1.4.5 SOUTHWARK STREETS

A modern day streetscape, that utilises classic materials in crisp contemporary geometry with contrasting finishes and textures creating a rich yet subtle backdrop to city life. A similar base palette is being used across new Southwark developments.

- Stone: GRANITE
- Origin: French
- Mix of pedestrian footways and shared surface side streets
- Footways 600mm coursed with medium length random format flags
- Shared access streetscape 300mm coursed with medium length random format flags
- regular staggered bond finish with crisp sawn edges
- A single grey colour tone but with integral variation in the natural stone that gives added interest, some areas warm and brown when wet
- Variation in laying pattern subtly highlights vehicle flow
- Laying/grouting : rigid construction with screed grout in neutral grey
- Feature elements:
Contrast cropped sett detailing to tree pits and Bike stands
- Cut stone benches in contrasting colour

User Guide ¹

Introduction ²⁻⁴¹

Street code ⁴⁴⁻⁵⁵

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Technical guide ⁶⁶⁻¹²¹

Maintenance ¹²²⁻¹²⁵

2

The following Street Code identifies a hierarchy of users and routes, from Main Street (with vehicular priority) through Side Streets to Pedestrian Dominated Spaces (with pedestrian priority).

This plan categorises all of the public realm streets and key pedestrianized spaces in the opportunity area in terms of overall form and purpose. There is a major distinction between streets with a traditional carriageway separating pedestrian from vehicular traffic and shared streets where all modes of transport move around on a common flush surface with no delineation. Between these two groups there may be streets with carriageways defined but with no kerb upstand. Much of the streetscape lies within unadopted public realm with full and uninterrupted public access 24 hours a day 364 days of the year. The design of these should respond to individual briefs to make distinct and purposeful spaces. However, each proposal should be developed in the context of the character of the area and the overall VNEB OAPF.

The plan and sectional diagrams on the following pages illustrate each street category. It should be noted that the construction layers are shown as indicative only and that implementation teams will have responsibility for the structural design in each case.

All of the surfacing materials referred to are detailed in section 04 of this document.



Key

**Main Street**

Vehicle access in traditional road carriageway. Pedestrian movement predominantly confined to footways and marked crossings.

**Side Street - Traditional Layout**

Vehicle access in carriageway which is designed to reduce vehicle speed and increase pedestrian comfort and safety. Typically bitmac surface to carriageway.

**Side Street - Pedestrian Friendly Layout**

Vehicle access in carriageway which is designed to reduce vehicle speed, greatly increase pedestrian comfort and safety and to emphasise spatial continuity with footways. Typically stone sett surface in carriageway to visually emphasise pedestrian dominance.

**Pedestrian Dominated Street or Space**

Pedestrian space with vehicle access only for maintenance and emergencies.

**Tube Station**



2.1 MAIN STREET

Unrestricted vehicle access in traditional road carriageway

Design speed	40mph
Carriageway	as TfL guidance
Footway	Nom. 5.5 m (4 m minimum), includes 2 m activity curtilage (to TFL Guidance)
Bus Stops	@400 m intervals (to TFL Guidance)
Kerb upstand	125 mm
Traffic regulations	red route
Cycles	integrated in bus lane
Crossings	frequent, integrated with junctions
Drainage	traditional, road gullies in channels
Furniture	aligned in footway (bus stop, litter bins, etc)
Lighting	column mounted luminaire street lighting
Utilities	located in footways and carriageways
Tree Planting	Platanus x acerifolia - London Planes. Minimum 1.3m offset from front of kerb. To approved detail.

Refer to the following Technical Details for specification information:

- 4.1.1 Granite Flags Footway (Main St)
- 4.1.3 Granite Flags Crossover
- 4.1.4 Sandstone Flags
- 4.1.6 Granite Setts
- 4.1.8 Granite Kerb Upstand (125mm)
- 4.1.10 Granite Radius Kerbs
- 4.1.11 Granite Quadrant Kerb stones
- 4.1.12 Granite Tactile Flags
- 4.1.15 Tree Surround Footway (Main St)
- 4.1.16 Service Covers
- 4.1.17 Gully Grating
- 4.1.18 Covered Channels and slot drains
- 4.1.19 End of Phase Granite Trim



2.2 SIDE STREET : TRADITIONAL LAYOUT

Unrestricted vehicle access in carriageway which is designed to reduce vehicle speed and increase pedestrian comfort and safety.

Design speed 20 mph

Carriageway 5.5 m minimum single carriageway with opposing single lanes. Dual arrangement: two 3.5 m minimum, lanes with central swale

Footway
3 m minimum width, 2 m minimum clear way

Kerb upstand 75 mm

Traffic regulations Ponton Road adopted, all others not adopted and privately managed

Cycles in carriageway

Parking on street, defined bays, blue badge holder bays where appropriate to DfT standards

Loading on street, designated zones

Crossings frequent, unsignalised.

Drainage in channels with road gullies connected to park SUDS

Furniture in footway where wide enough (litter bins, etc)

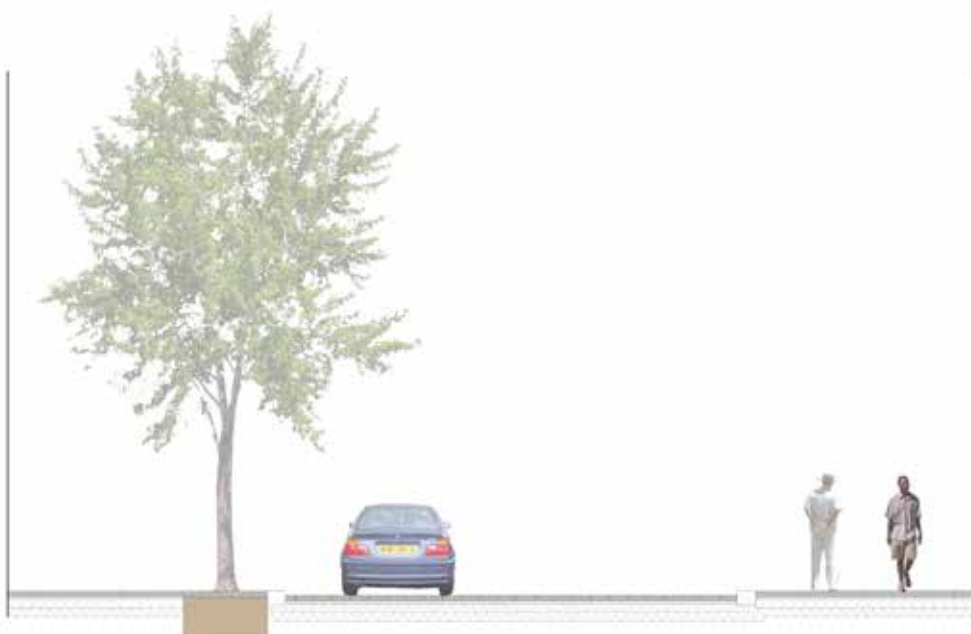
Lighting column mounted luminaire street lighting

Utilities located in footways and carriageways

Tree Planting Specimen trees to approved detail.

Refer to the following Technical Details for specification information:

- 4.1.2 Granite Flags Footway (Side St)
- 4.1.3 Granite Flags Crossover
- 4.1.5 Sandstone Flags
- 4.1.6 Granite Setts
- 4.1.9 Granite Kerb Upstand 75mm
- 4.1.10 Granite Radius Kerbs
- 4.1.11 Granite Quadrant Kerb stones
- 4.1.12 Granite Tactile Flags
- 4.1.13 Granite Trims and Drainage Channels
- 4.1.15 Tree Surround Footway (Side Street)
- 4.1.16 Service Covers
- 4.1.17 Gully Grating
- 4.1.18 Covered Channels and slot drains
- 4.1.19 End of Phase Granite Trim



2.3 SIDE STREET : PEDESTRIAN FRIENDLY LAYOUT

Unrestricted vehicle access in carriageway which is designed to reduce vehicle speed, greatly increase pedestrian comfort and safety and to emphasise spatial continuity with footways.

Design speed	20 mph
Carriageway	5.5 m minimum, wider at tight corners
Footway	3 m minimum width, 2 m minimum clear way
Kerb upstand	75 mm
Traffic regulations	Adopted and non-adopted.
Cycles	in carriageway
Parking	on street, defined bays, blue badge holder bays where appropriate to DfT standards
Loading	none
Crossings	not signal control, frequent, wide, raised to footway level with vehicle ramps
Drainage	in channels with road gullies connected to SUDS
Furniture	in footway where wide enough (litter bins, seats etc)
Lighting	column mounted luminaire street lighting
Utilities	located in footways and carriageways

Refer to the following Technical Details for specification information:

- 4.1.2 Granite Flags Footway (Side St)
- 4.1.3 Granite Flags Crossover
- 4.1.5 Sandstone Flags (Side St)
- 4.1.6 Granite Setts
- 4.1.9 Granite Kerb Upstand 75mm
- 4.1.10 Granite Radius Kerbs
- 4.1.11 Granite Quadrant Kerb stones
- 4.1.12 Granite Tactile Flags
- 4.1.13 Granite Trims and Drainage Channels
- 4.1.15 Tree Surround Footway (Side Street)
- 4.1.16 Service Covers
- 4.1.17 Gully Grating
- 4.1.18 Covered Channels and slot drains
- 4.1.19 End of Phase Granite Trim



2.4 PEDESTRIAN DOMINATED SPACE

Pedestrian space with vehicle access only for maintenance and emergencies.

Design speed:

5 mph, maintenance and emergency vehicles only

Carriageway : none, but 4 m minimum clear access provided where necessary

Footway: 2 m minimum clear access, mostly much wider

Kerb upstand none, all surfaces flush

Detailed design for spaces must incorporate navigation measures for visually impaired pedestrians.

Traffic regulations not adopted and privately managed

Parking: none

Loading: none

Drainage in channels with road gullies connected to SUDS

Furniture frequent but located to leave main spaces clear (litter bins, seats etc)

Lighting:

column mounted luminaire and other 'architectural' lighting

Utilities: only if necessary

User Guide ¹

Introduction ²⁻⁴¹

Street code ⁴²⁻⁵³

Stone selection ⁵⁶⁻⁶⁷

Technical guide ⁶⁸⁻¹²¹

Maintenance ¹²²⁻¹²⁵

3

There follows the selected stone materials proposed for Nine Elms on the South Bank area:

1. Standard Areas
2. Special Areas

Please note that the physical Control Panels (comprising actual stone samples) should be used for visual verification, as printed and photographic representations may vary.



Standard Areas

Stone Control Panel

CORNISH DE LANK GRANITE





Kerbs

300mm wide Silver
Grey Granite.
Flamed finish.

Main Street Flags

600mm coursed Cornish De Lank
Granite
Flamed finish

Side Street Flags

300mm coursed Cornish De Lank
Granite
Flamed finish.

Setts

150 coursed Cornish De Lank Granite
Sawn sides, flamed top surface

75mm coursed Cornish De Lank
Granite

Sawn sides, cropped top surface

Channels

300mm wide Cornish De Lank Granite
Sawn sides, flamed top surface

CE	
De Lank Quarry Limited, St. Breward, Bodmin, Cornwall, PL30 4NQ, Tel: 01208 850217	
13	
EN 1342:2012	
Natural stone setts	
Cornish De Lank Grey Granite, St Breward, Bodmin, England	
For external pedestrian and/or vehicular circulation areas	
Release of Dangerous Substances	NPDx
Breaking strength: compressive strength dry (EN1926)	219 Mpa
Slipperiness: skid resistance wet (EN14231)	69 (flame textured)
hewn setts are assumed to give satisfactory slip resistance	
Skid resistance:	NPDx
Durability: compressive strength against freeze/thaw (0.08% loss recorded)	NPDx
Freeze/thaw with de-icing salts	NPDx
Polished Stone Value (PSV)	53
Other:	
Density	2644 kg/m ³
Water Absorption	0.20%
Abrasion Resistance	17.9
X No performance determined	

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CE	
De Lank Quarry Limited, St. Breward, Bodmin, Cornwall, PL30 4NQ, Tel: 01208 850217	
13	
EN 1341:2012	
Natural stone slabs	
Cornish De Lank Grey Granite, St Breward, Bodmin, England	
For external pedestrian and/or vehicular circulation areas	
Release of Dangerous Substances	NPDx
Breaking strength: flexural strength (EN12372)	24,1 Mpa
Slipperiness: skid resistance wet (EN14231)	69 (flame textured)
Skid resistance:	NPDx
Durability: Of flexural strength against freeze/thaw (0.08% loss recorded)	24,08 Mpa
Freeze/thaw with de-icing salts	NPDx
Other:	
Density	2644 kg/m ³
Water Absorption	0.20%
Abrasion Resistance	17.9
X No performance determined	

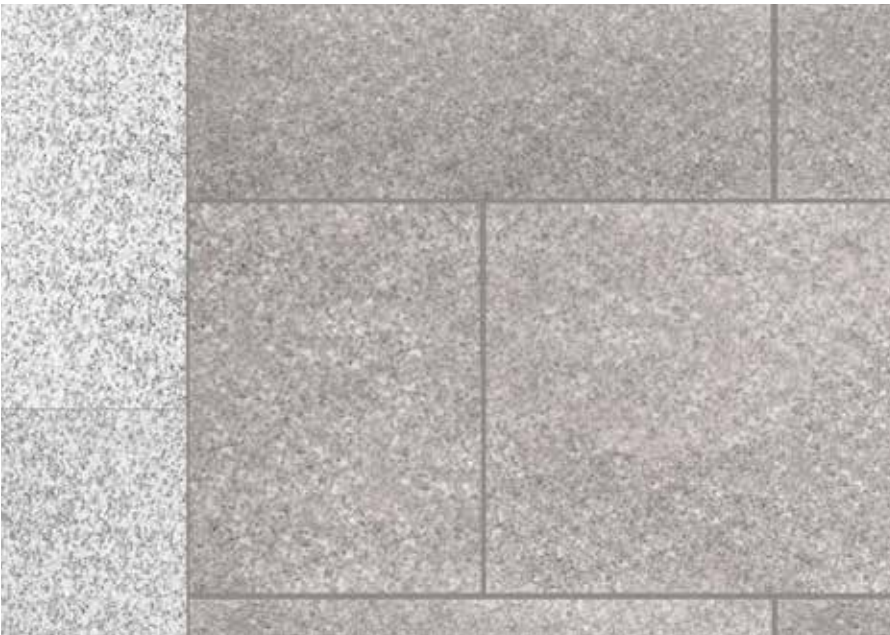
©De Lank Quarry Ltd, June 2013.



Main Street

Composition study

Footways - 600mm coursed granite flags



Colour : Single grey shade

Contrast or mix: n/a

Size and scale: large (600mm coursed)

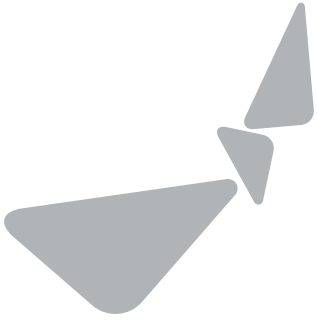
Texture: Moderate to strong.
Sawn sides.

Adjacent surfacing: Silver
grey flamed kerbstone.

300mm wide.



Precedent from Southwark Street, London.



Side Street

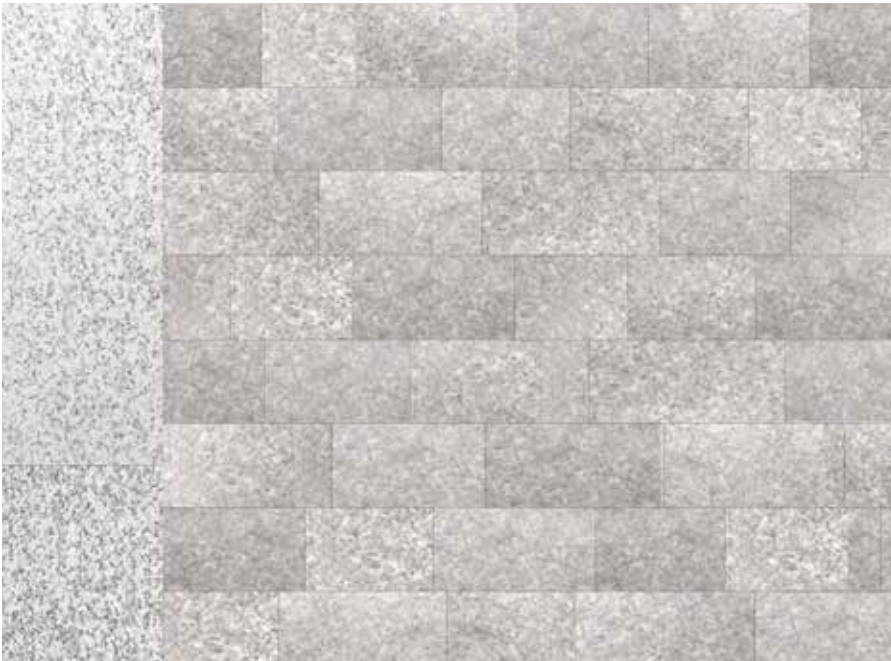
Composition study

Footways - 300mm coursed granite flags



Colour : Single grey shade
Contrast or mix: low
Size and scale: Medium
(300mm coursed)
Texture: Moderate
Adjacent surfacing: Silver
grey flamed kerbstone.
300mm wide.

Carriageways and Cross Overs



Colour : single grey granite
shade
Contrast or mix: Low
Size and scale: Small
(150mm coursed)
Texture: low. Sawn sides.
Adjacent surfacing: Silver
grey flamed kerbstone.
300mm wide. 435mm wide
stone channel runs for
drainage.





SPECIAL AREAS

Main Street / Side Streets in
Conservation Areas
Pedestrian Dominated Spaces

Composition study

BRITISH SANDSTONE

600mm coursed x 600-1100mm random
lengths x 65mm thickness.



Main Street Footways in
Conservation Areas
Albert Embankment area.

BRITISH SANDSTONE

300mm coursed x 300-900mm random
lengths x 65mm thickness.



Side Street Footways in
Conservation Areas
Albert Embankment area.



Stone Control Panel



Forest of Dean Sandstone

[CE Mark description to add]

Special stone sizes for particular pedestrian dominated spaces, as appropriate to the design.





SPECIAL AREAS

Side Street Carriageways

Pedestrian dominated spaces

Composition study



GRANITE SETTS IN 4 SHADES

150mm coursed x 150mm thick x random lengths 150-300mm.

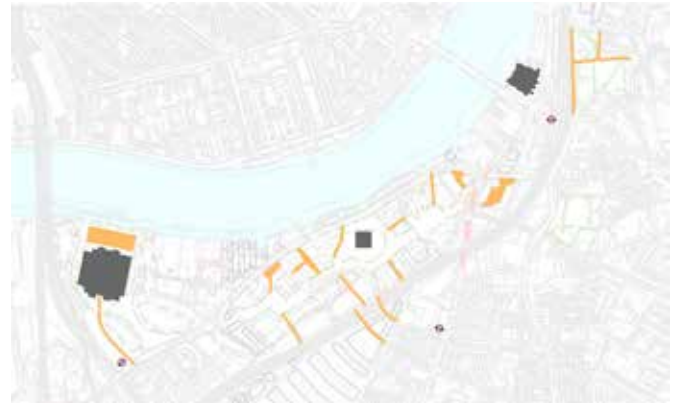
[CE Mark descriptions to add for each colour]

- Colour : Silver Grey (Cornish flamed granite) + Light Beige, Light Red and Black
- Contrast within mix: Four tones, medium contrast
- Size and scale: Small (150mm coursed)
- Texture: low. Sawn sides.
- Adjacent surfacing: Silver grey fine picked kerbstone. 300mm wide. 435mm wide stone channel runs for drainage.



Precedent for colour mix: Somerset House, London.

10% black
10% light red
40% light beige
40% silver grey



Stone Control Panel



Cornish De Lank Granite to be included in the sett mix

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Technical guide ⁶⁸⁻¹²¹

Maintenance ¹²²⁻¹²⁵

4



GENERALLY

This section describes the various materials which will be used in the Nine Elms area. This 'Baseline Palette' should be considered the base approved palette of materials adopted by the relevant authorities. Individual projects may wish to include a wider range of materials and methods in response to site specific briefs, local circumstances and adjacent developments. These are referred to as the 'Enhanced Palette'. However, it is the intention of the client group, with the help of this document, to limit the number of materials in the Nine Elms area. The Enhanced Palette being the exception to the rules set here. The aim being to create co-ordinated public realm materials, of a consistent quality, standards and appearance.

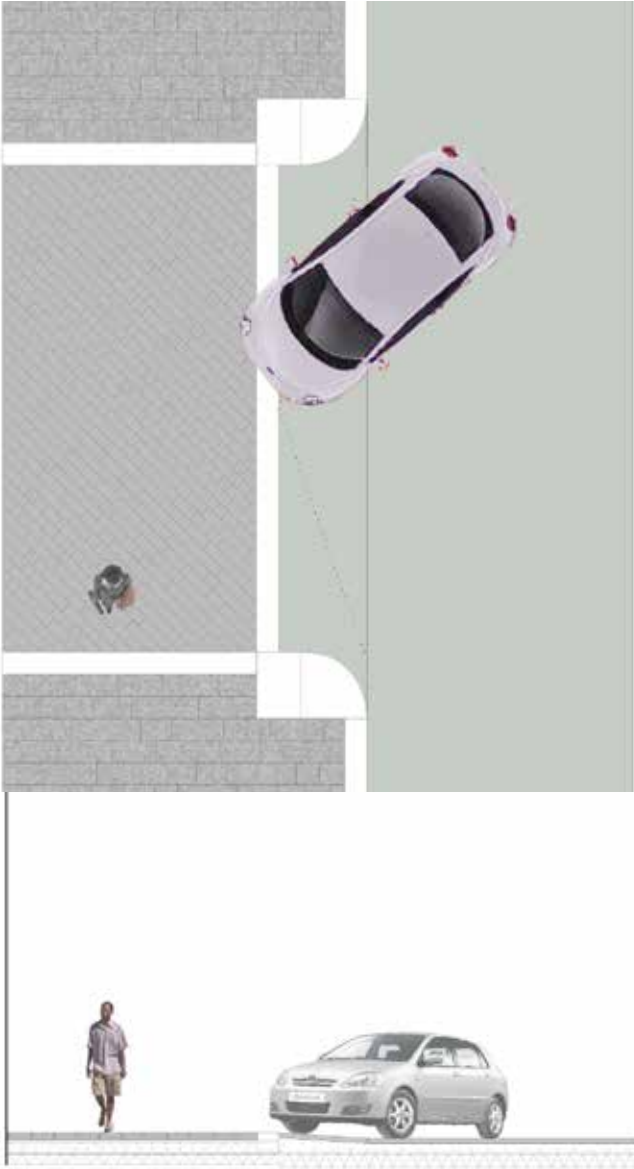
In Camlins experience these drawings are accurate in describing the surfacing materials suitable for the required performance over time. However, it should be noted that in each instance the structural design must be determined by the responsible engineer, and in particular refer to the vehicle loadings which are to be accommodated. All material thicknesses must refer to the British Standard of the material in question, and structural requirements - all as specified by the responsible Engineer.

The structural design should take account of the inter-related issues of:

- thermal movement
- construction joints
- vehicular and pedestrian access required during construction

It is advised that the two most recognised sources of design guidance for these types of stone surfacing are:

- BS7533: Part 12
- Natural Stone Surfacing: A Practical Guide, 2nd edn. by Society of Chief Officers of Transportation in Scotland).



4.1 TECHNICAL LAYOUTS

A. VEHICLE CROSS OVER - HIGH LEVEL INTENSE USE.

Refer to the following Technical Details for specification information:

- 4.1.2 Granite Flags Footway (Side St)
- 4.1.5 Sandstone Flags (Side St)
- 4.1.6 Granite Setts
- 4.1.7 Sandstone Setts
- 4.1.9 Granite Kerb Upstand 75mm
- 4.1.12 Granite Quadrant Kerb stones
- 4.1.13 Granite Tactile Flags
- 4.1.14 Granite Trims and Drainage Channels
- 4.1.17 Service Covers
- 4.1.18 Gully Grating

Examples from Leeds, London and Lisbon of angled orientation of paving materials.





4.1 TECHNICAL LAYOUTS

B. VEHICLE CROSS OVER - LOW LEVEL INFREQUENT USE

Refer to the following Technical Details for
specification information:

4.1.2	Granite Flags Footway (Side St)	57
4.1.3	Granite Flags Crossover	59
4.1.8	Granite Kerb Upstand 75mm	69
4.1.10	Granite Quadrant Kerb stones	73
4.1.15	Service Covers	83
4.1.16	Gully Grating	85



4.1 TECHNICAL LAYOUTS

Refer to the following Technical Details for specification information:

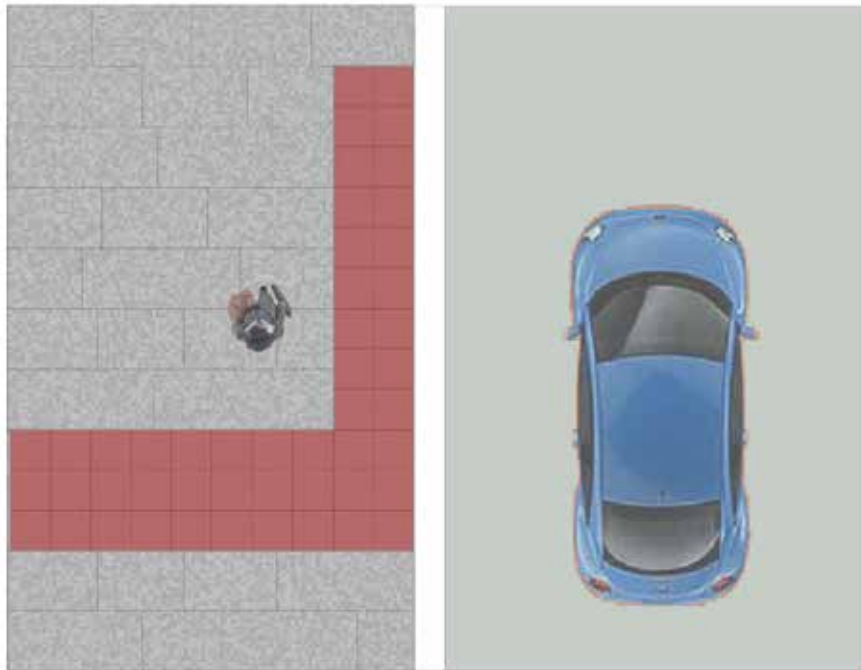
- 4.1.1 Granite Flags Footway (Main St)
- 4.1.2 Granite Flags Footway (Side St)
- 4.1.3 Granite Flags Crossover
- 4.1.4 Sandstone Flags Footway (Main St)
- 4.1.5 Sandstone Flags Footway (Side St)
- 4.1.6 Granite Setts
- 4.1.9 Granite Kerb Upstand 75mm
- 4.1.10 Granite Radius Kerbs
- 4.1.11 Granite Quadrant Kerb stones
- 4.1.12 Granite Tactile Flags
- 4.1.13 Granite Trims and Drainage Channels
- 4.1.15 Tree Surround Footway (Side Street)
- 4.1.16 Service Covers
- 4.1.17 Gully Grating
- 4.1.18 Covered Channels and slot drains

C. MAIN STREET | SIDE STREET JUNCTION

Junction types are determined by a combination of:

- The types of streets which converge
- Vehicular movement which is to be accommodated
- Pedestrian movement which is to be accommodated, particularly in busy pedestrian routes
- The degree of pedestrian priority over vehicle movement
- The architectural character of the area is taken into account within the streets types

The following pages show diagrams to illustrate the principles of the junction layouts. Junctions are the most complicated parts of the public realm in terms of traffic management, highway layout and structural design of surfacing. Each situation is unique and these archetypal layouts are to be interpreted and designed in detail by the teams responsible for each scheme.

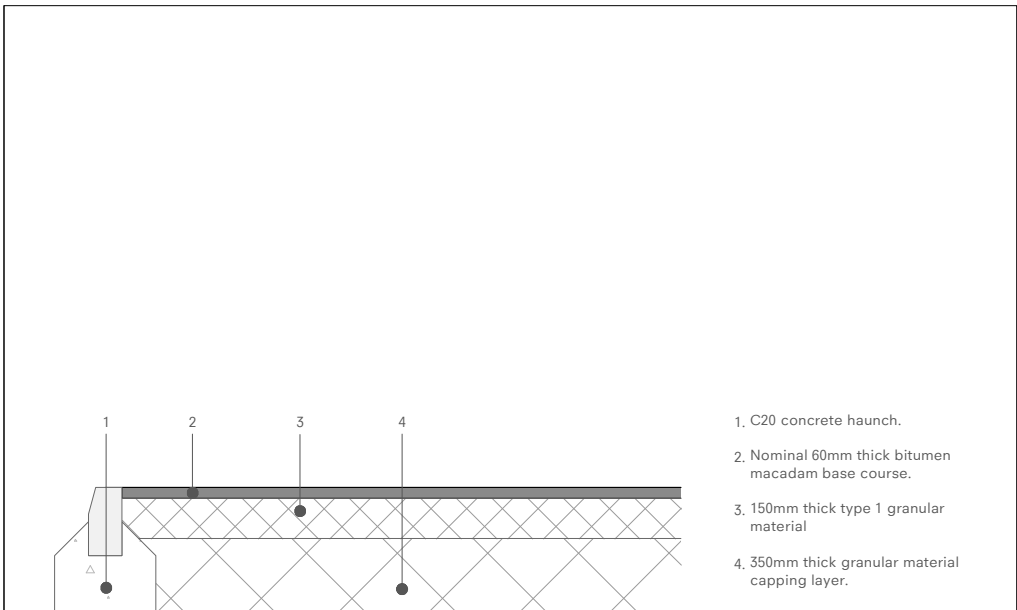
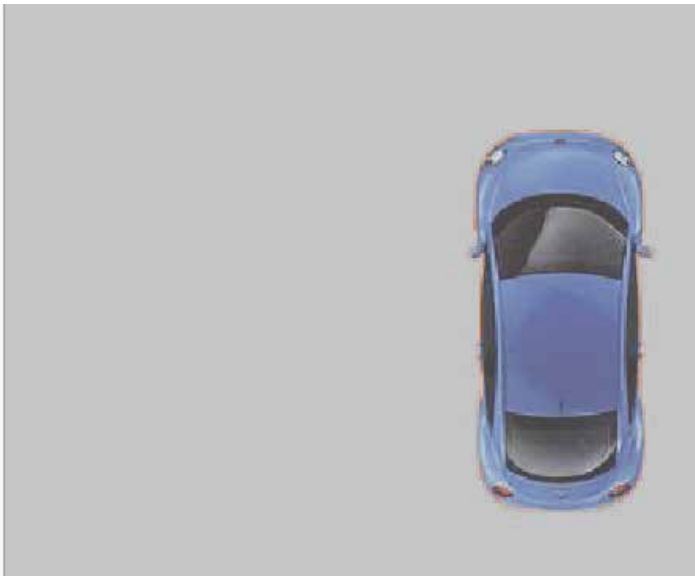


4.1 TECHNICAL LAYOUTS

D. MAIN STREET PEDESTRIAN CROSSING

Refer to the following Technical Details for specification information:

4.1.1	Granite Flags Footway (Main St)	55
4.1.4	Sandstone Flags	63
4.1.8	Granite Kerb Upstand 125mm	69
4.1.11	Granite Tactile Flags	75



4.1 TECHNICAL LAYOUTS

E. TEMPORARY FOOTWAY SURFACE

Sacrificial surface whilst works carried out to adjacent areas.

Temporary kerb:

Pre-cast concrete half battered kerb

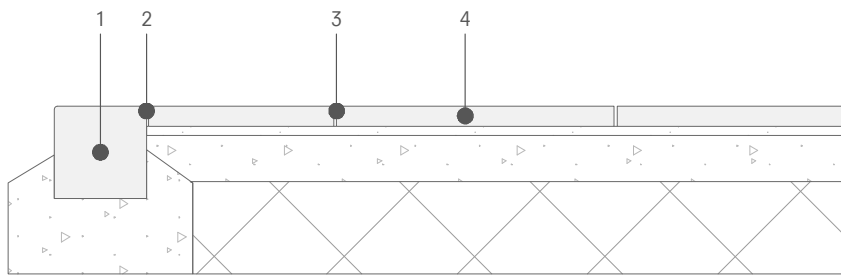
125mm wide x 255mm deep x 600mm lengths.

Quadrants, transitions, radius kerbs and drop kerbs also to be pre-cast concrete.

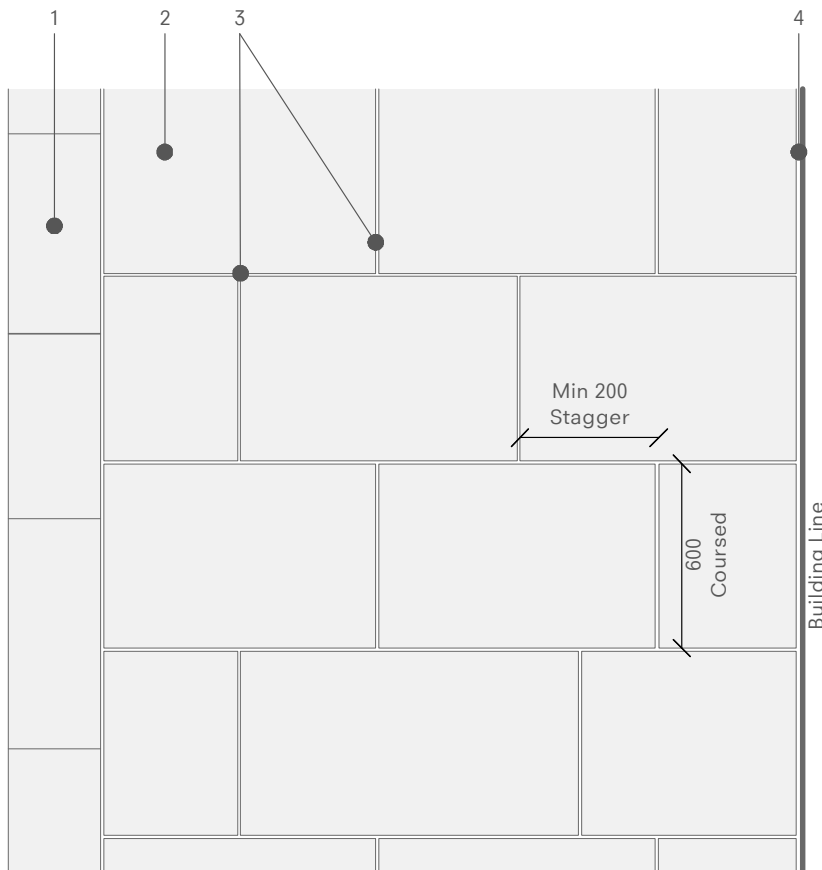
Temporary surface:

Bitumen macadam 60mm thick base course

to be laid on Type 1 road base.



1. 300 x 300 x 600-1100mm Granite Kerb.
2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
3. For widths and grouts refer to specification notes.
4. Granite flags 600mm coursed x random length (600-1100mm) x 65mm thick.



1. 300 x 300 x 600-1100mm Granite Kerb.
2. Flag surfacing minimum slab size 450 x 600mm, maximum slab size 600 x 1100mm.
3. Stagger generated from kerb.
4. 20mm movement joint at building

Movement joint to Engineer's specification.

Flag coursing to be set out perpendicular to the building line.



MAIN STREET

Nine Elms Vauxhall Cross	For approval
	TfL + LBL

* = Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, sub-base construction, and compliance with relevant British Standard compliance.



4.1.1 GRANITE FLAG FOOTWAY

DIMENSIONS / FINISH OF STONE

Dimensions:

600mm coursed x 600-1100mm lengths x 65mm thick*

Finish: Flamed

Cut: Sawn sides

Colour: To meet Stone Control Panel qualities.

GREEN GUIDE 2008 RATING: A or B

QUALITY OF SURFACE

Flags to be laid to achieve an even and smooth surface to the approval of the CA. 1mm max. difference in level between any two adjacent flags at the common joint.

JOINT WIDTHS

Laid in regular staggered courses with nom. 8mm joint width at surface (min. 6mm to max. 10mm variation permitted only to accommodate local irregularities in flag dimension tolerance). Perpendicular joints minimum stagger of 200mm.

GROUTING

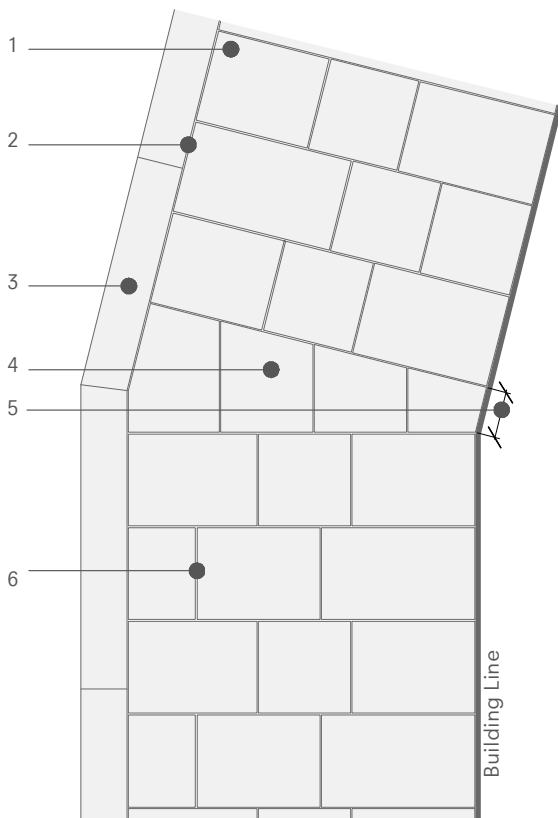
Colour of grout to complement granite colour and to be approved. Top of joints to be even throughout and nominally flush with absolutely minimal recess as necessary to accommodate variations of stone surface.

SITE CUTTING OF STONE

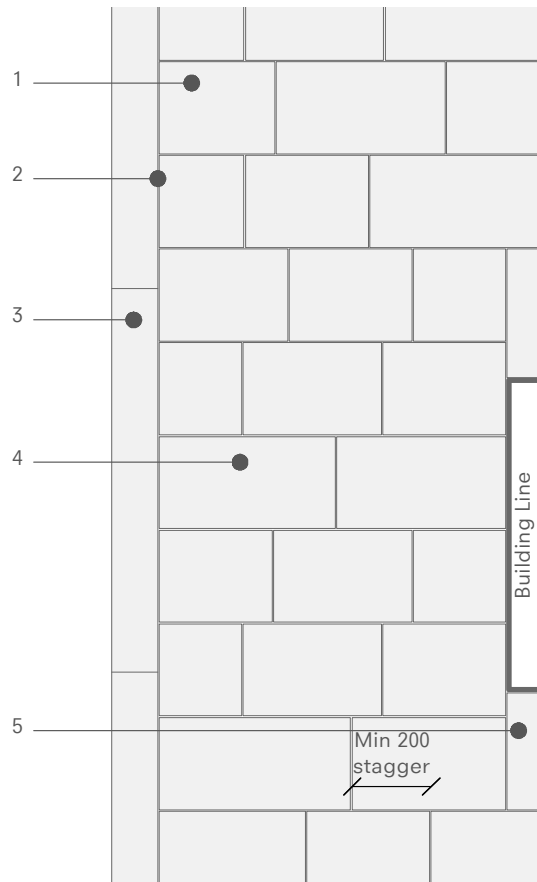
Site cutting to be minimised by careful selection of stone. Cut flags to be at ends of courses and adjacent to obstacles only, with no flag less than 600 x 450mm.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.



1. Granite flags 600mm coursed x random length (600-1100mm) x 65mm thick.
2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
3. 300 x 300 x 600-1100mm Granite kerb.
4. Flags rotated to avoid narrow slabs of cut stone in footway. Minimum flag width 200mm.
5. Minimum dimension 300mm.
6. For widths and grouts refer to specification notes.



1. Granite flags 600mm coursed x random length (600-1100mm) x 65mm thick.
2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
3. 300 x 300 x 600-1100mm Granite kerb.
4. For widths and grouts refer to specification notes.
5. Flags rotated to avoid cutting at building line.

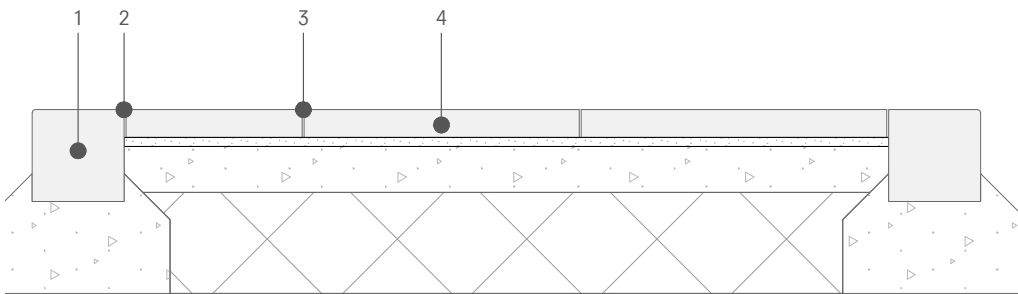


It is important that the detailing of flag layouts identifies where coursing may change from the norm. Such occurrences that require the rotation of flags and setts include:

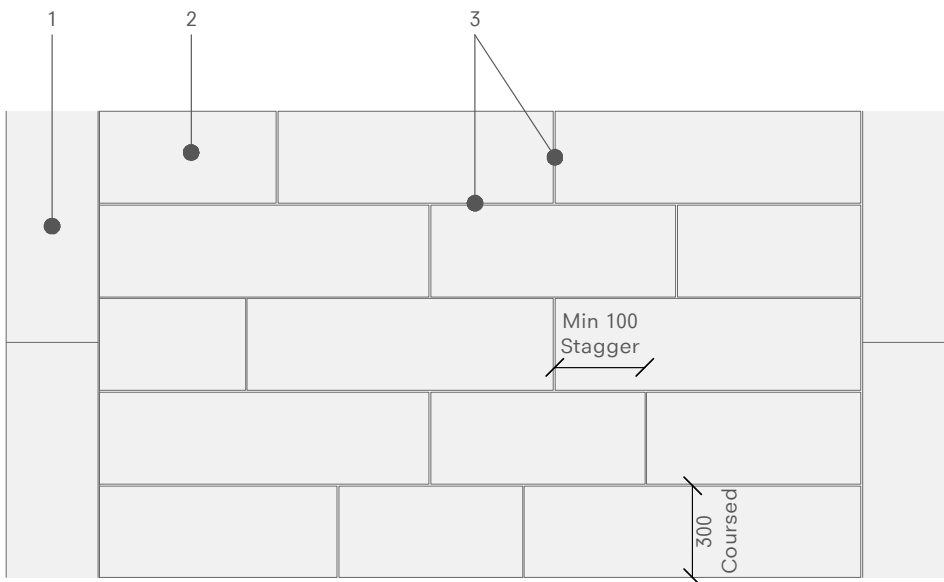
- building lines
- drainage trim stones
- kerb lines
- changes in direction of footway

It is critical that the stone paving stays within the minimum parameter size stipulated, in order to avoid weakness in the construction from having small pieces of paving. The process is to rotate the paving in question to 90° from its original coursing. This is indicated in the adjacent two situations.

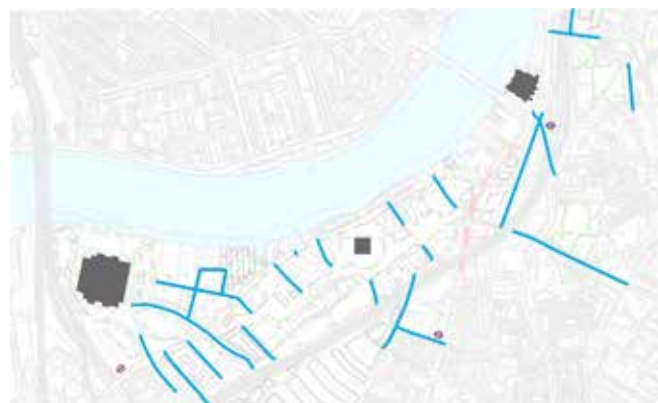




1. 300 x 300 x 600-1100mm Granite Kerb.
2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
3. For widths and grouts refer to specification notes.
4. Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.



1. Granite kerb edging.
2. Flag surfacing minimum slab size 300 x 300mm, maximum slab size 300 x 1100mm.
3. Stagger generated from kerb.



SIDE STREET

Nine Elms Vauxhall Cross	For approval
	TfL + LBL

MORTAR BED, BASE, SUB BASE & FORMATION LAYER
To Engineer's specification to be in accordance with BS 7533:2006.

- * = Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, sub-base construction, and compliance with relevant British Standard



4.1.2 GRANITE FLAG FOOTWAY

DIMENSIONS/ FINISH OF STONE

Dimensions: 300mm x 300-1200mm random lengths x 90mm thick*

Finish: Flamed

Cut: Sawn sides

Colour: According to Stone Control Panel.

GREEN GUIDE 2008 RATING: A or B

QUALITY OF SURFACE

Flags to be laid to achieve an even and smooth surface to the approval of the CA. 1mm max. difference in level between any two adjacent flags at the common joint.

JOINT WIDTHS

Laid in regular staggered courses with nom. 6mm joint width at surface (min. 5mm to max. 7mm variation permitted only to accommodate local irregularities in flag dimension tolerance). Perpendicular joints minimum stagger of 100mm.

GROUTING

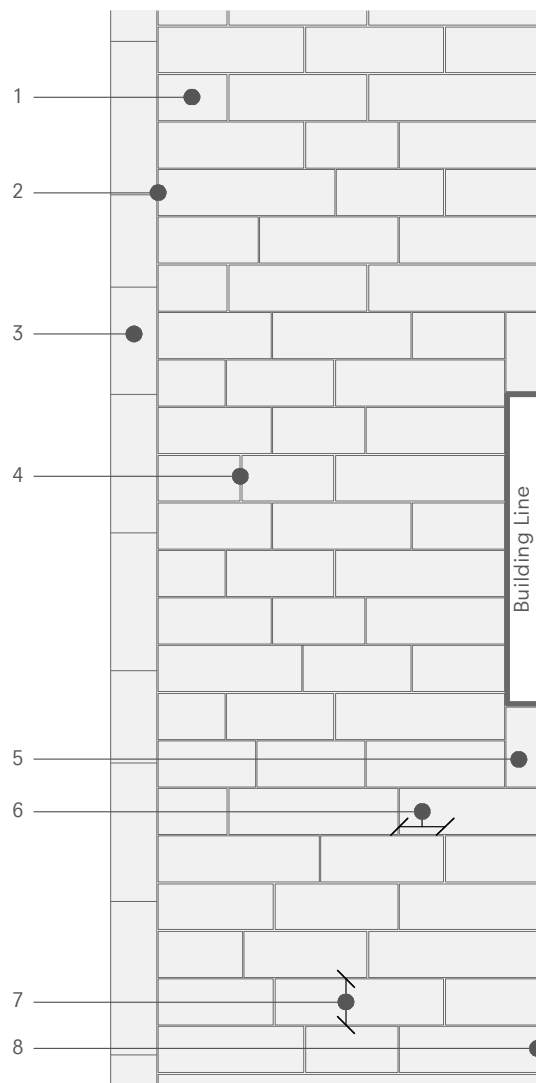
Colour of grout to complement granite colour and to be approved.

Joints to be fully packed with no air gaps or other impurities.

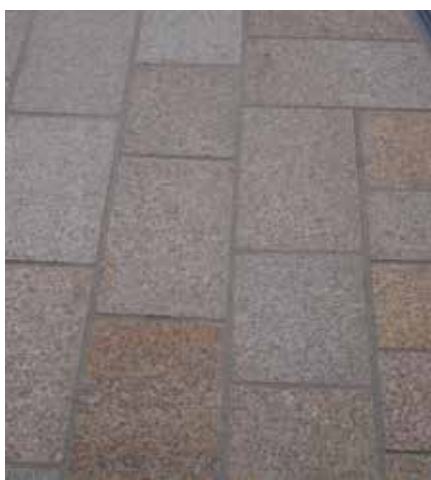
Top of joints to be even throughout and nominally flush with absolutely minimal recess as necessary to accommodate variations of stone surface.

SITE CUTTING OF STONE

Site cutting to be minimised by careful selection of stone. Cut flags to be at ends of courses and adjacent to obstacles only, with no flag less than 300 x 300mm. The quality of the cuts is to be of same quality as original production masonry.



1. Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.
2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
3. 300 x 300 x 600-1100mm Granite kerb.
4. For widths and grouts refer to specification notes.
5. Flags rotated to avoid cutting at building line
6. Minimum 200mm stagger.
7. 300mm Coursed
8. 20mm Movement joint at building

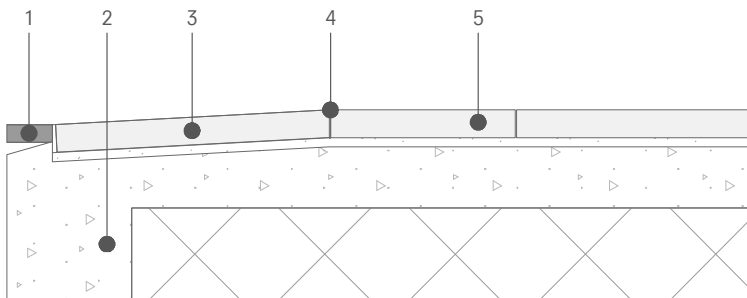


It is important that the detailing of flag layouts identifies where coursing may change from the norm. Such occurrences that require the rotation of flags and setts include:

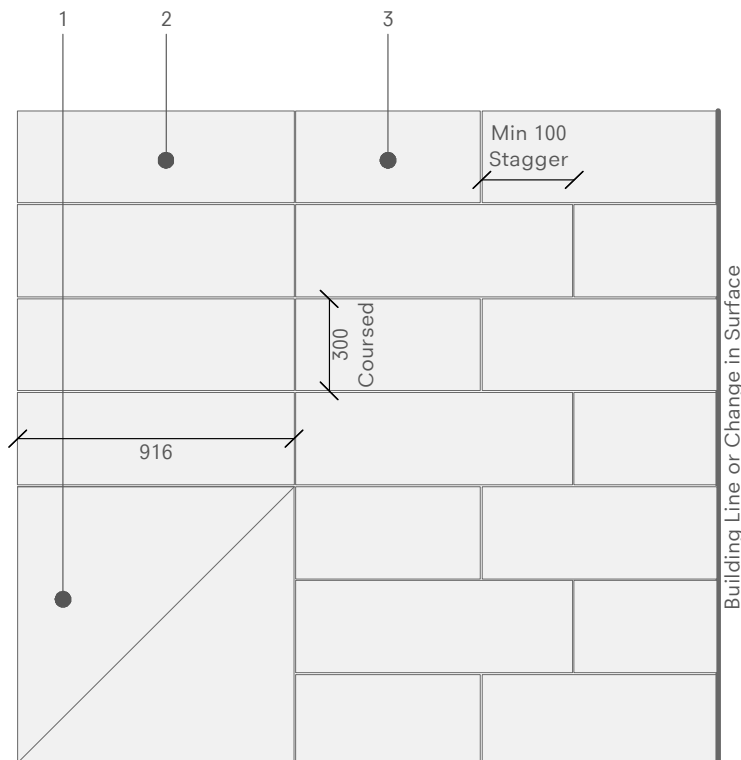
- building lines
- drainage trim stones
- kerb lines
- changes in direction of footway

It is critical that the stone paving stays within the minimum parameter size stipulated, in order to avoid weakness in the construction from having small pieces of paving. The process is to rotate the paving in question to 90° from its original coursing. This is indicated in the adjacent two situations.





1. Bitmac surface.
2. Concrete foundation to adjacent kerb.
3. Granite flag crossover, 300 coursed x 900 x 90mm. 1 in 12 slope.
4. Crossover stone flag edge cut on site to appropriate angle to meet adjacent foot way flags.
5. Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.



1. Granite corner quadrant (see drawing LL441-DE-018).
2. Granite flag crossover, 300 coursed x 900 x 90mm. 1 in 12 slope.
3. Granite flag footway, (see drawing LL441-DE-004).



SIDE STREETS

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	LBW + LBL

* = Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.

4.1.3 GRANITE FLAG CROSS OVER

DIMENSIONS / FINISH OF STONE

Dimensions: 300 x 300-600 x 100mm thick*

Finish: Flamed

Cut: Sawn sides

Colour: Silver grey

GREEN GUIDE 2008 RATING: A or B

QUALITY OF SURFACE

Flags to be laid to achieve an even and smooth surface to the approval of the CA. 1mm max. difference in level between any two adjacent flags at the common joint.

JOINT WIDTHS

Laid in regular staggered courses with nom. 6mm joint width at surface (min. 4mm to max. 8mm variation permitted only to accommodate local irregularities in flag dimension tolerance). Joints normally staggered by min. 450mm.

GROUTING

Colour of grout to complement granite colour and to be approved. Joints to be fully packed with no air gaps or other impurities. Top of joints to be even throughout and nominally flush with absolutely minimal recess as necessary to accommodate variations of stone surface.

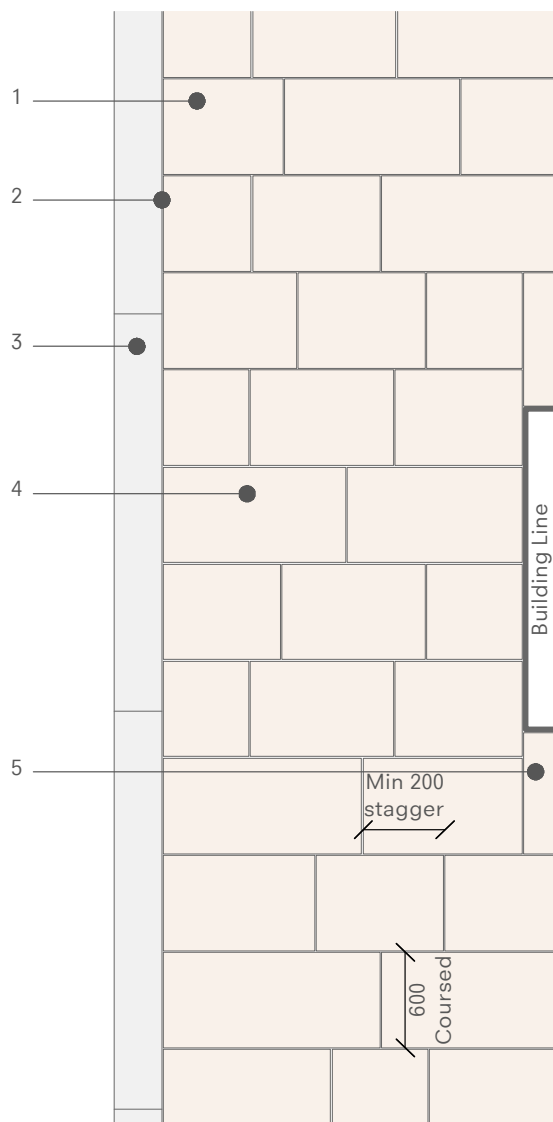
SITE CUTTING OF STONE

Site cutting to be avoided by careful selection of stone. Cut flags to be at ends of courses and adjacent to obstacles only, with no flag less than 300 x 600mm. The quality of the cuts is to be of same quality as original production masonry.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.





1. Yorkstone flags 600mm
coursed x random length
(600-1100mm) x 65mm thick.

2. Flag surfacing to be laid with
consistent joint against back
edge of kerb. Edge of flag
surfacing to be 5mm proud of
top of kerb to avoid ponding.

3. 300 x 300 x 600-1100mm Granite
kerb.

4. For widths and grouts refer to
specification notes.

5. Flags rotated to avoid cutting
at building line.

- * - Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.



MAIN STREET

Albert Embankment	For approval
	TfL + LBL



4.1.4 SANDSTONE FLAGS (YORKSTONE OR SIMILAR UK SOURCED)

DIMENSIONS/ FINISH OF STONE

Dimensions:

600mm coursed x 600-900mm random lengths x 65mm thick* To be diamond sawn to all six faces and flame textured on top surface.

400 min. size of cut flag. To be cut from full size flag as necessary to create stagger.

To be very durable fine grained sandstone with good weathering properties.

Colour: Buff/grey with inclusions of buff brown or blue areas

GREEN GUIDE 2008 RATING: A or B

QUALITY OF SURFACE

Flags to be laid to achieve an even and smooth surface to the approval of the CA. 1mm max. difference in level between any two adjacent flags at the common joint.

JOINT WIDTHS

Laid in regular staggered 600mm courses with nom. 8mm joint width (6mm min. to 10mm max.).

Joints staggered by min. 100mm.

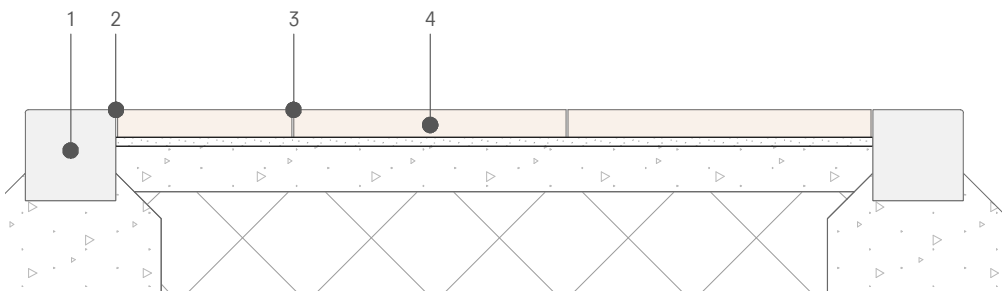
SITE CUTTING OF STONE

Site cutting to be minimised by careful selection of stone. Cut flags to be at ends of courses and adjacent to obstacles only, with no flag less than 300 x 600mm.

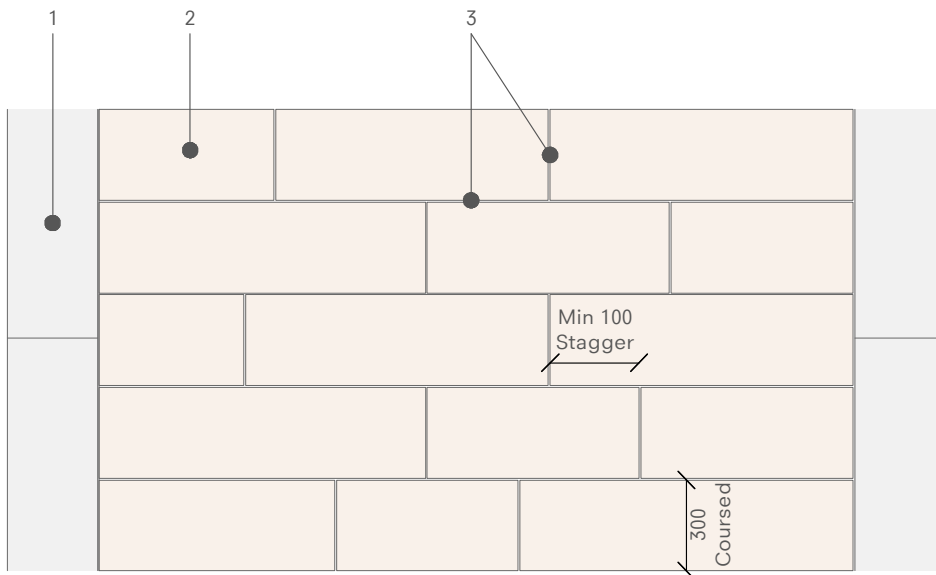
MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.



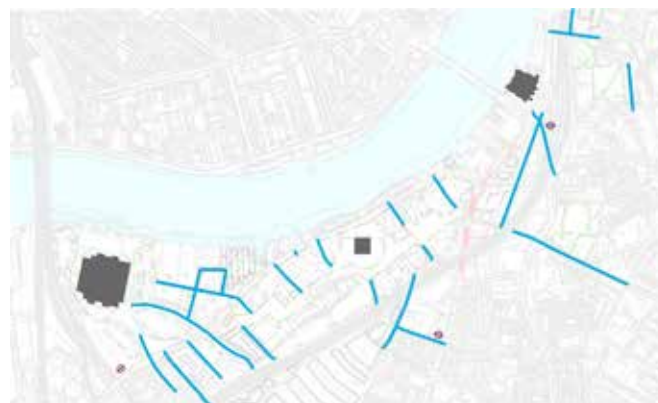


1. 300 x 300 x 600-1100mm Granite Kerb.
2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
3. For widths and grouts refer to specification notes.
4. Yorkstone flags 300mm coursed x random length (300-1100mm) x 90mm thick.



1. Granite kerb edging.
2. Flag surfacing minimum slab size 300 x 300mm, maximum slab size 300 x 1100mm.
3. Stagger generated from kerb.

- * - Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.



SIDE STREET



Albert Embankment	For approval
	LBL

4.1.5 SANDSTONE FLAGS (YORKSTONE OR SIMILAR UK SOURCED)

DIMENSIONS/ FINISH OF STONE

Dimensions: 300mm x 300-1200mm random lengths x 90mm thick*

Colour: Buff/grey with inclusions of buff brown or blue areas

GREEN GUIDE 2008 RATING: A or B

QUALITY OF SURFACE

Flags to be laid to achieve an even and smooth surface to the approval of the CA. 1mm max. difference in level between any two adjacent flags at the common joint.

JOINT WIDTHS

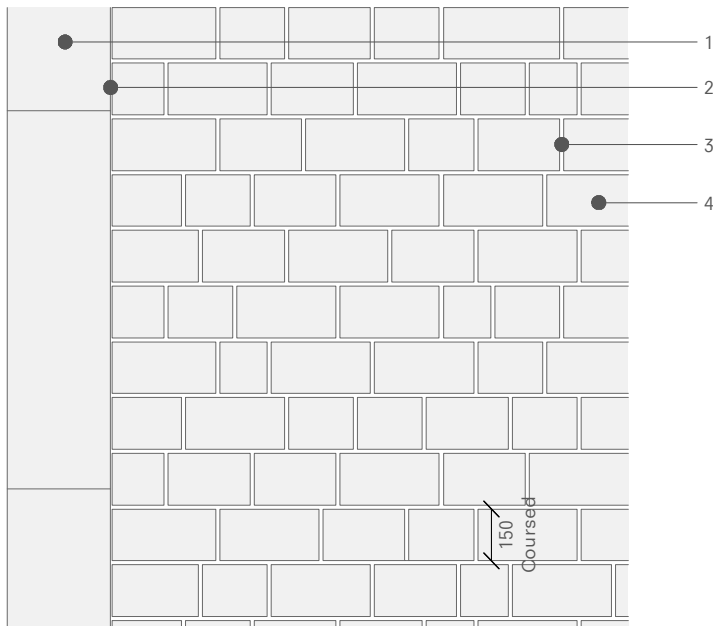
Laid in regular staggered 600mm courses with nom. 6mm joint width (5mm min. to 7mm max.). Joints staggered by min. 100mm.

SITE CUTTING OF STONE

Site cutting to be minimised by careful selection of stone. Cut flags to be at ends of courses and adjacent to obstacles only, with no flag less than 300 x 600mm.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.



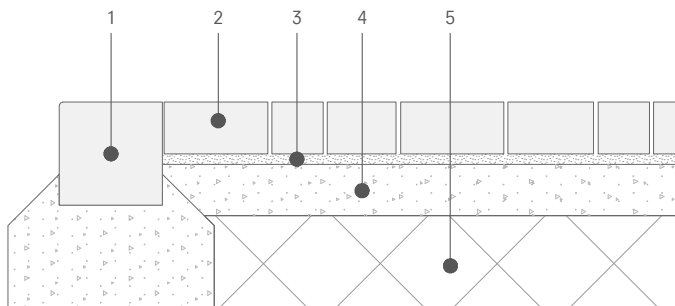
1. 300 x 300 x 600-1100mm Granite Kerb.

2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.

3. For widths and grouts refer to specification notes.

4. Granite setts 150mm coursed x random length (150-300mm) x 150mm thick.

Stagger generated from kerb.



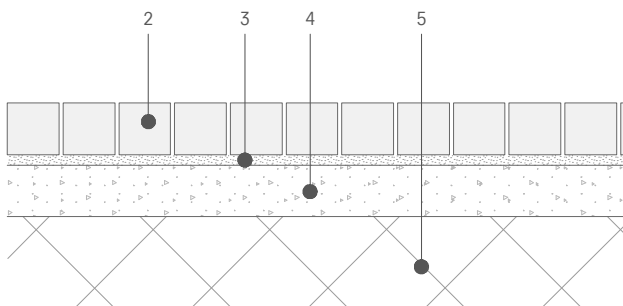
1. 300 x 300 x 600-1100mm Granite Kerb.

2. Granite setts 150mm coursed x random length (150-300mm) x 150mm thick.

3. Bedding to Engineer's specification

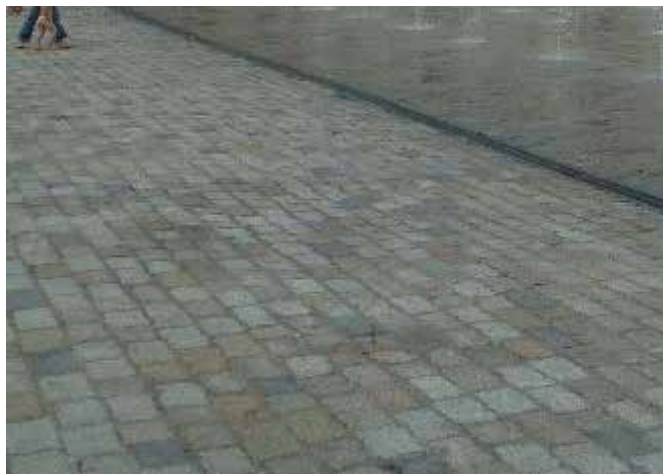
4. Concrete to Engineer's specification

5. Sub base to Engineer's specification





SIDE + PEDESTRIAN DOMINATED STREETS



For approval	
Nine Elms Vauxhall Cross	TFL LBW

4.1.6 GRANITE SETTS

SELECTION / FINISH OF STONE

150 coursed x 150 thickness x length range (150-300)
Lengths - 150mm (15%), 170mm (15%), 210mm (20%), 250mm (20%), 270mm (15%), 300mm (15%).

Tolerance of +/- 2mm (total 4mm variation) in any dimension.

Sawn sides, flamed top surface to BS EN 1342:2012.
Min. size of cut stone to be 150mm.

Colours: Shades according to Stone Control Panel.

GREEN GUIDE 2008 RATING: A or B

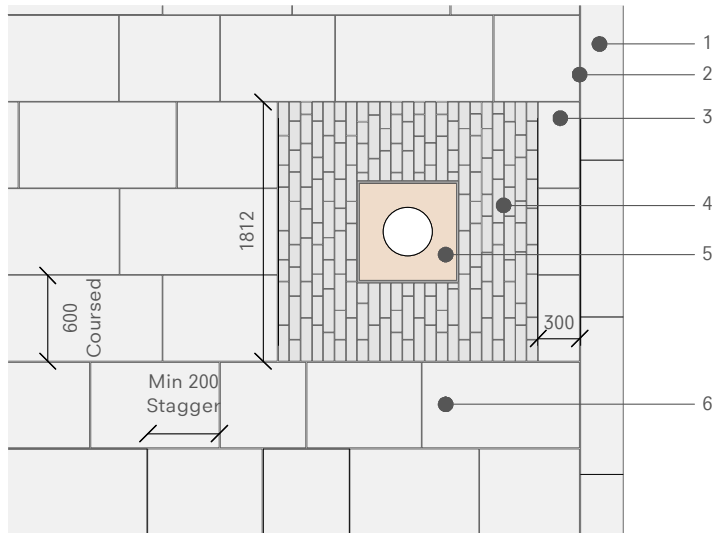
JOINTS

Laid in regular staggered courses with nom. 8mm joint width (min.10mm to max.16mm variation permitted only to accommodate local irregularities in course dimension within a sett). Joints staggered by min. 50mm not incl. joint except min. 30mm for setts less than 200mm length. This must be achieved by orientating setts as necessary to accommodate shape with shape of adjacent stones.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

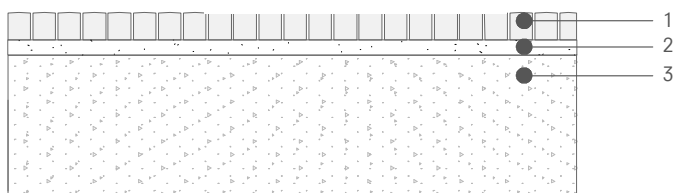
To Engineer's specification to be in accordance with BS 7533:2006.





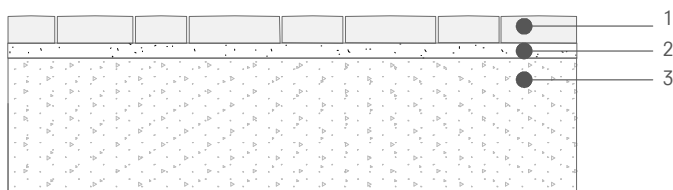
Tree Pit Detail (Type 2)
Scale 1:50

1. 300 x 300 x 600-1100mm Granite kerb.
 2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
 3. Granite flags 600mm coursed x 300mm length x 90mm thick.
 4. Granite setts 75mm coursed x random length (150-300mm) x 90mm thick.
 5. Stainless steel trim overall outside dimension of frame at surface to be nom. 707mm x 707mm to suit coursing of infill setts including joints nom 4mm.
- Exact location of frame to be determined according to setting out of sett courses .
6. Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.



Granite Setts Section A
Scale 1:25

1. Granite setts 75mm coursed x random length (150-300mm) x 90mm thick. Cropped top surface.
2. Setts to be bedded in 30mm thick sharp sand bed.
3. Proprietary compactable growing medium suitable for specimen trees.



Granite Setts Section B
Scale 1:25



SIDE + PEDESTRIAN DOMINATED STREETS

Nine Elms Vauxhall Cross Albert Embankment	For approval
--	--------------

4.1.7 GRANITE SETTS FOR TREE PITS

SELECTION / FINISH OF STONE

75mm coursed x 90mm depth x 100-300mm lengths.*

Min. size of cut stone to be 150mm.

Cropped top face, sawn to all other sides.

To be to BS EN 1324:2012 finish and tolerances as minimum.

Tolerance to coursing width to be +/- 1mm (total variation 2mm)

Tolerance to depth to allow for cropped face to be +/- 4mm. (total maximum variation 8mm).

To be applied as part of tree pit surface detail (Type 2).

GREEN GUIDE 2008 RATING: A or B

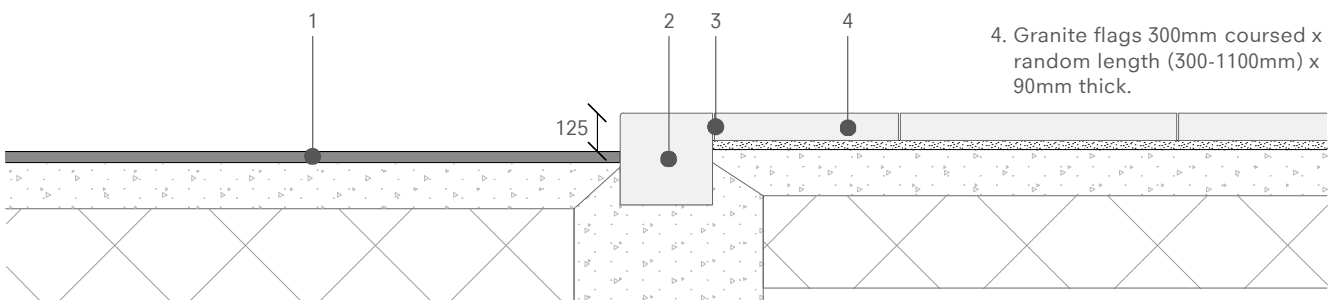
JOINTS

Laid in regular staggered courses with nom.6mm (+/- 1mm) joint width.

Joints staggered by min. 50mm not incl. joint except min. 30mm for setts less than 200mm length.

Joints to be filled with sharp sand to allow percolation of water to the tree.

* Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.





MAIN STREET

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	TfL + LBL + LBW

4.1.8 GRANITE KERB UPSTAND (125MM UPSTAND)

DIMENSIONS / FINISH OF STONE

300mm wide x 300mm depth x random lengths (600-1100).*

Finish: Sawn to all faces, Flamed top and 125 upstand face
Bullnose 10mm radius.

Colour: Silver grey.

GREEN GUIDE 2008 RATING: A or B

PERPEND JOINTS

Kerb and channel stones to be laid end to end with an open unpointed 2mm joint (1mm min. to 4mm absolute max) between ends.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

Kerb stones to be butt jointed, however where openings in the joint are inevitable (as shown in photograph adjacent) the joint should be filled with cementitious material, and maximum joint allowed to be 4mm.



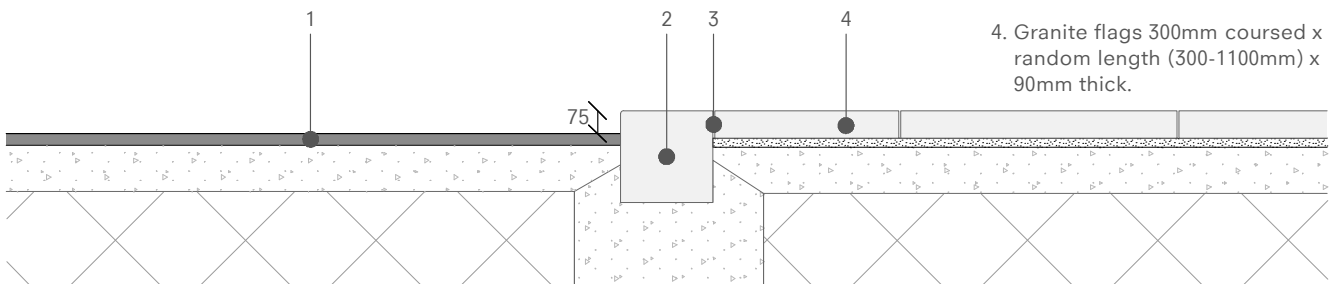
* Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.



2. 300 x 300 x 600-1100 Granite kerb.

3. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.

4. Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.





SIDE STREETS

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	LBL + LBW

4.1.9 GRANITE KERB UPSTAND (75MM UPSTAND)

DIMENSIONS / FINISH OF STONE

300mm wide x 300mm depth x random lengths (600-1100).*

Finish: Sawn to all faces, flamed top and 75 upstand face
Bullnose 10mm radius. To BS 1343:2012

Colour: Silver grey.

GREEN GUIDE 2008 RATING: A or B

PERPEND JOINTS

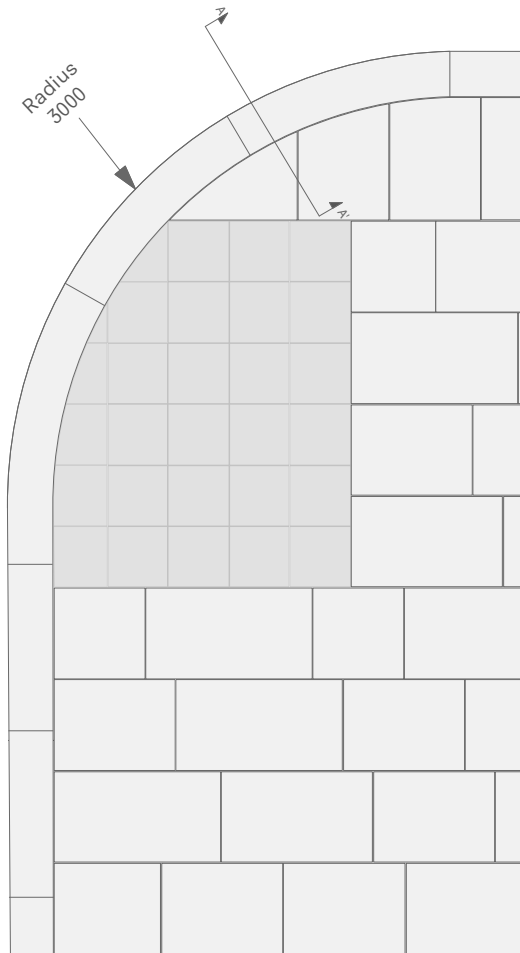
Kerb and channel stones to be laid end to end with an open unpointed 2mm joint (1mm min. to 4mm absolute max) between ends.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

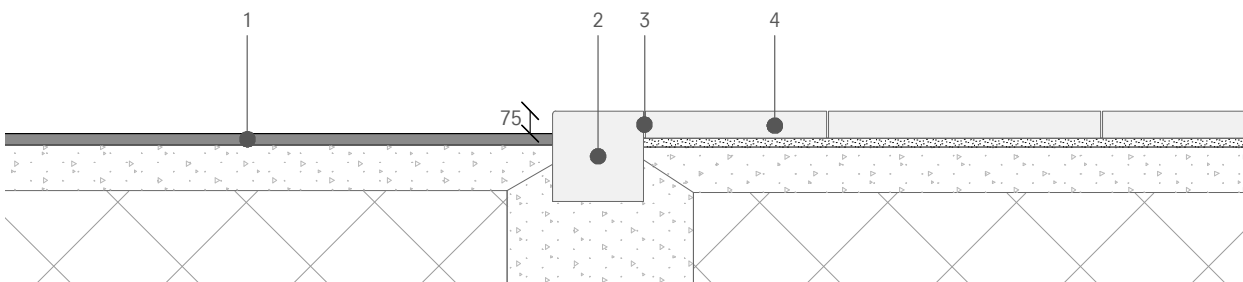


* Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.



1. Bitmac surfacing.
2. 300 x 300 x 600-1100 Granite kerb.
3. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
4. Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.

Granite Radius Kerb Plan
Scale 1:50



Granite Radius Kerb Section
Scale 1:25



MAIN STREET

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	TfL + LBL + LBW

3.1.10 GRANITE RADIUS KERBS

DIMENSIONS / FINISH OF STONE

300mm wide x 300mm depth x random lengths (600-1100).*

Shaped to form 2m / 3m / 3.5m / 4m / 5m external radius as required.

Finish: Sawn to all faces, flamed top and 150 upstand face
Bullnose 10mm radius. To BS 1343:2012

Colour: Silver grey.

GREEN GUIDE 2008 RATING: A or B

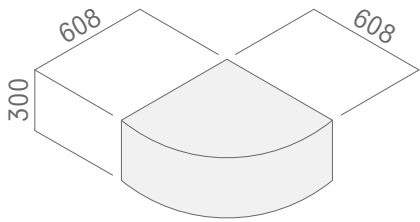
PERPEND JOINTS

Kerb and channel stones to be laid end to end with an open unpointed 2mm joint (1mm min. to 4mm absolute max) between ends.

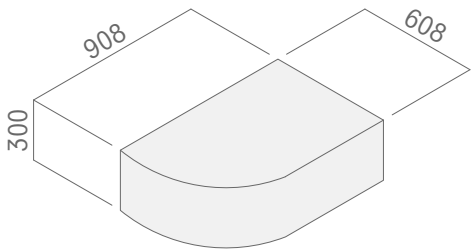
MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

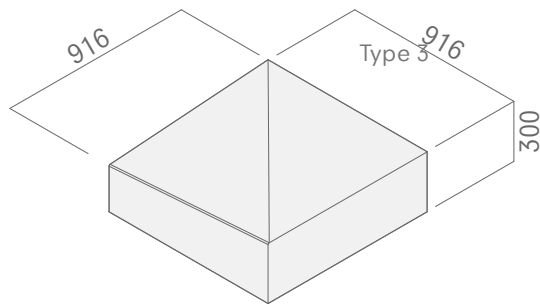
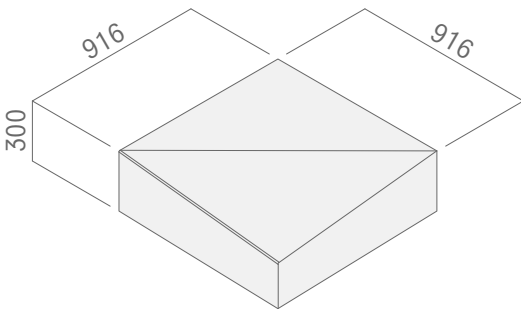
* Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.



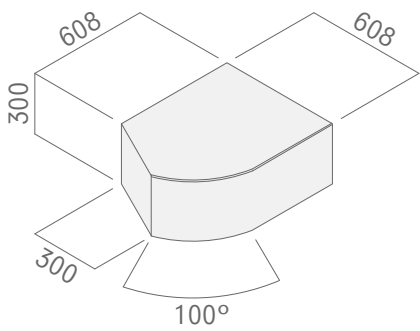
Type 1



Type 2



Type 3



Type 4



MAIN STREET

- * Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	TfL + LBL + LBW

4.1.11 GRANITE QUADRANT KERB STONES

DIMENSIONS / FINISH OF STONE

Type 1 - simple quadrant:
608mm x 608mm with 90° outside radius.

Type 2 - Lengthened Simple Quadrant
608mm x 908mm with 90° outside radius.

Type 3 - Square ramp quadrant
916 x 916 x 225-300mm

Type 4 - Connecting quadrant:
600mm wide to 300mm wide with outside radii between of:
Type 3a: 90 °
Type 3b: 100 °
Type 3c: 120 °

Finish: Sawn to all faces, flamed top
Bullnose 10mm radius.
To BS 1343: 2012.
Colour: Silver grey.

GREEN GUIDE 2008 RATING: A or B

PERPEND JOINTS

Kerb and channel stones to be laid end to end with an open unpointed 2mm joint (1mm min. to 4mm absolute max) between ends.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.







MAIN + SIDE STREET

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	TfL + LBL + LBW

4.1.12 GRANITE TACTILE FLAGS

SELECTION / FINISH OF STONE

Granite

400mm x 400mm x 65mm total thickness.

To be diamond sawn to all six faces and blister pattern top.

Blister pattern geometry to be approved.

Colour: Dark grey at uncontrolled crossings, red at controlled crossings.

GREEN GUIDE 2008 RATING: A or B

JOINTS

Laid in grid bond with nom. 7mm joint width (5mm min. to 8mm max.). Adjacent sett surfacing to be laid with consistent nom. 7mm wide joint against tactile flag
Max. aggregate size in jointing grout to be 2mm in any dimension.

Colour of grout to complement stone colour and to be approved.

Joints to be fully packed with no air gaps or other impurities. Jointing grout to be cleaned completely from surface. To be applied when bed is cured sufficiently to prevent any movement of flags during application.

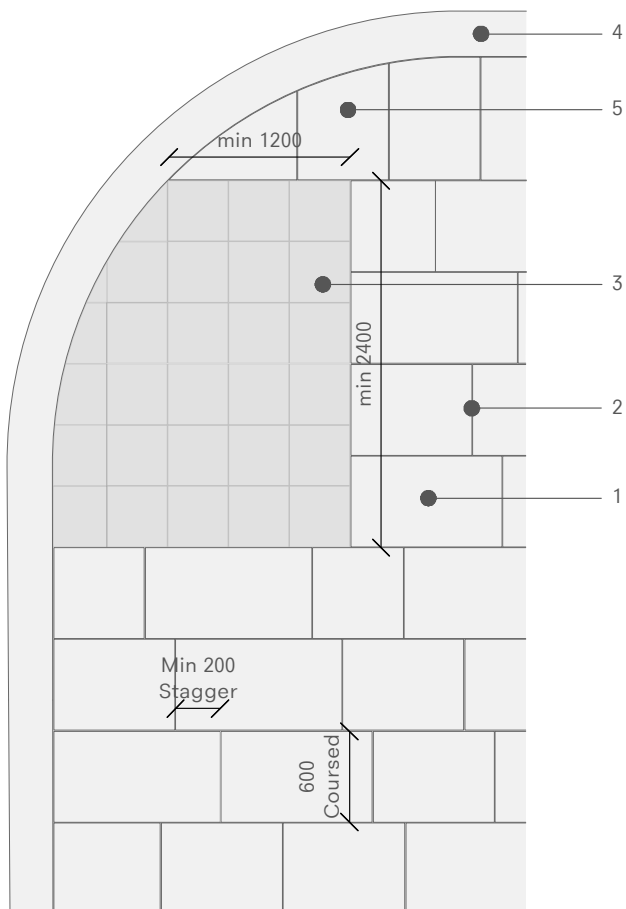
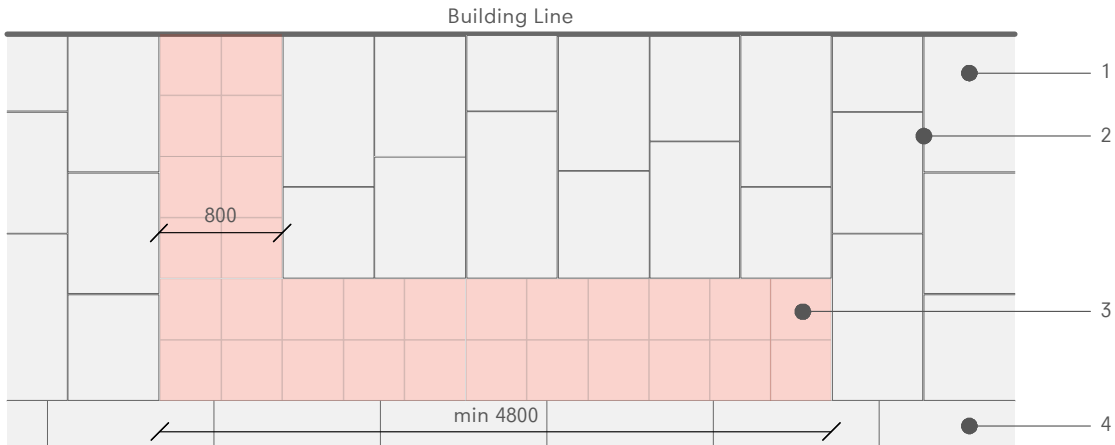
QUALITY OF SURFACE

Setts to be laid so as to achieve an even and smooth pedestrian surface to the approval of the CA. 1mm max. difference in level between any two adjacent setts at the common joint.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

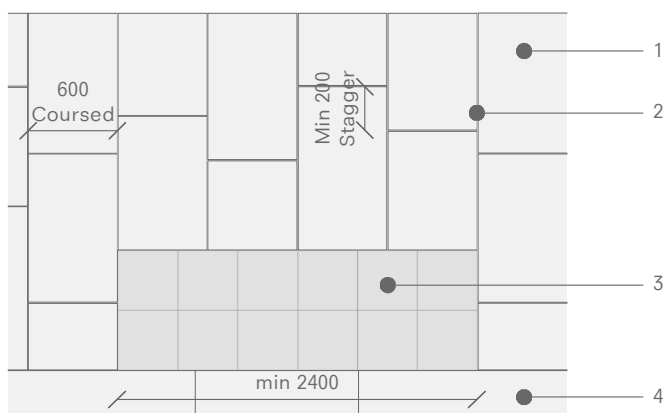




1. Granite flags 600mm coursed x random length (600-1100mm) x 65mm thick.

Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.

2. For widths and grouts refer to specification notes.
3. Granite Tactile Flags .400mm x 400mm x 65mm thick.
Minimum 800mm wide (extent)
2 rows at crossings.
4. 300 x 300 x 600-1100mm
Granite kerb.
5. Flags rotated to reduce cutting.



1. Granite flags 600mm coursed x random length (600-1100mm) x 65mm thick.

Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.

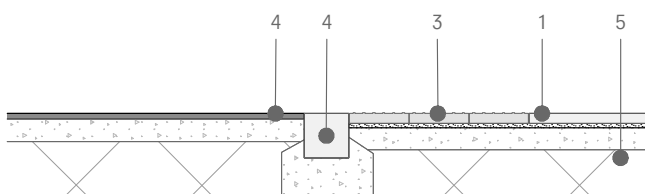
2. For widths and grouts refer to specification notes.

3. Granite Tactile Flags .400mm x 400mm x 65mm thick.
Minimum 800mm wide (extent)
2 rows at crossings.

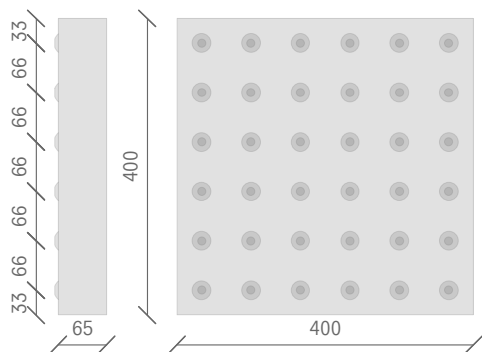
4. 300 x 300 x 600-1100mm
Granite kerb.

5. Bedding, Concrete, Sub Base
to Engineer's specification.

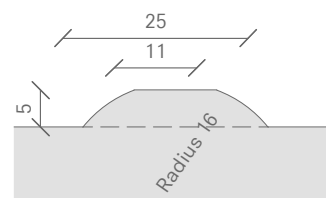
6. Bitmac surface.



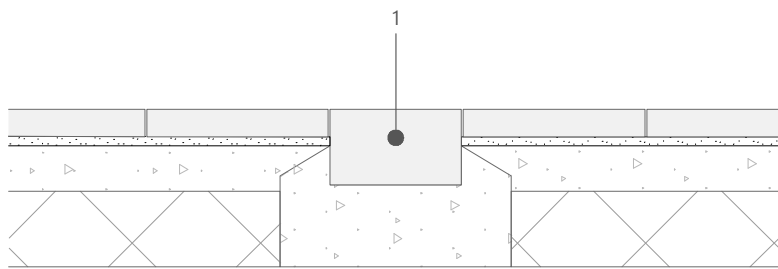
Tactile Flag Plan & Section
Scale 1:50



Tactile Flag Plan
Scale 1:10



Blister Top Section
Scale 1:1



Granite Flush Trim (435mm)
Scale 1:25

1. Granite Flush Trim 435mm x random lengths (600mm-1100mm) x 250mm deep.

Sawn to all faces, flamed top.

Colour: silver grey



SIDE + PEDESTRIAN DOMINATED STREETS

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	LBL + LBW

4.1.13 GRANITE DRAINAGE CHANNELS

SELECTION / FINISH OF STONE

435mm w x 250mm x random lengths (600-1500)*

Sawn to all faces, flamed top.

Colour: Silver grey

GREEN GUIDE 2008 RATING: A or B

PERPEND JOINTS

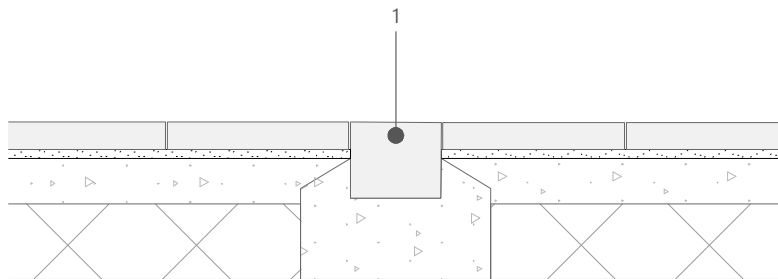
Kerb and channel stones to be laid end to end with an open unpointed 2mm joint (1mm min. to 4mm absolute max) between ends.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

* Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.



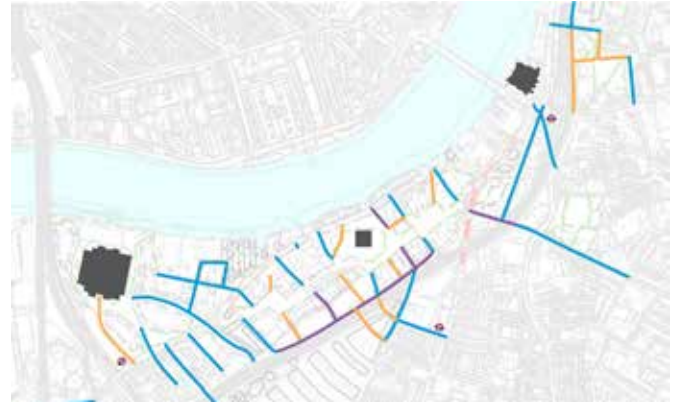


Granite Flush Trim (435mm)
Scale 1:25

1. Granite Flush Trim 300mm x random lengths (600mm-1100mm) x 250mm deep.

Sawn to all faces, flamed top.

Colour: silver grey



SIDE + PEDESTRIAN DOMINATED STREETS

Nine Elms	For approval
Vauxhall Cross	
Albert Embankment	LBL + LBW

4.1.14 GRANITE FLUSH TRIM

SELECTION / FINISH OF STONE

300mm w x 250mm x random lengths (600-1500)*

Sawn to all faces, flamed top.

Colour: Silver grey

GREEN GUIDE 2008 RATING: A or B

PERPEND JOINTS

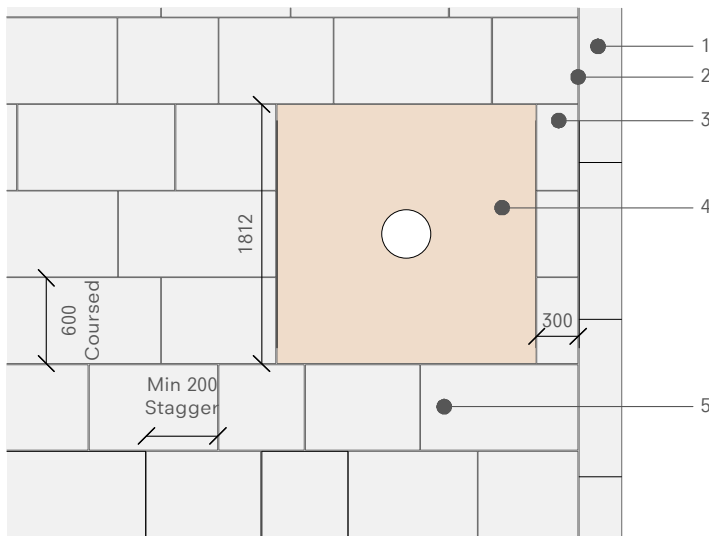
Kerb and channel stones to be laid end to end with an open unpointed 2mm joint (1mm min. to 4mm absolute max) between ends.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

- * Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.





1. 300 x 300 x 600-1100mm Granite kerb.
2. Granite surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
3. Granite flags 600mm coursed x 300mm length x 90mm thick.
4. Self binding aggregate. 75mm depth compacted to 60mm.
5. Exact location of frame to be determined according to setting out of sett courses .

Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.

Minimum 200mm stagger.



MAIN STREET

Nine Elms	For approval
	TfL

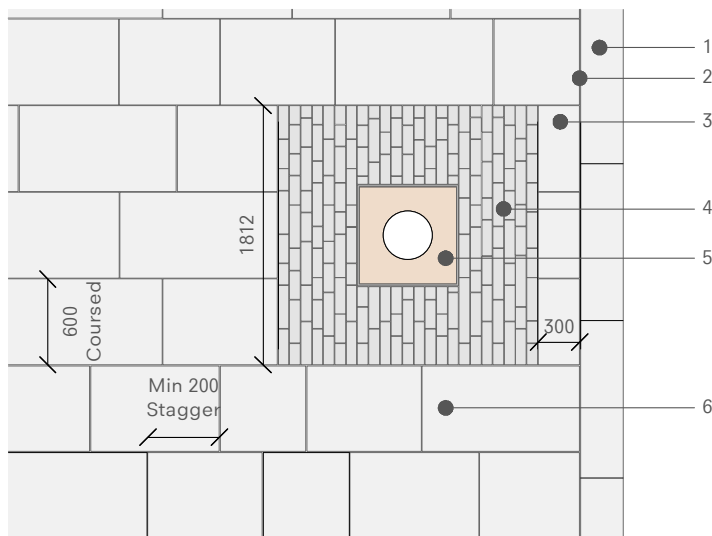
4.1.15 TREE SURROUND TYPE 1 - EXISTING TREE, MAIN STREET

Infil:

Self binding aggregate : 75mm depth compacted to 50mm minimum depth. Consisting of limestone and marl graded to form compactable surface.

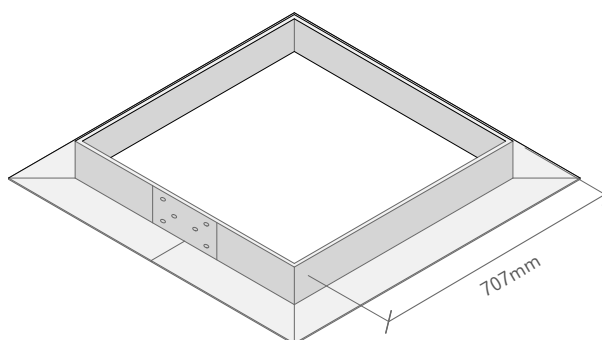
Suggested product: Breedon Amber Golden Gravel or similar approved.





Tree Pit Detail (Type 2)
Scale 1:50

1. 300 x 300 x 600-1100mm Granite kerb.
 2. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
 3. Granite flags 600mm coursed x 300mm length x 90mm thick.
 4. Granite setts 75mm coursed x random length (150-300mm) x 90mm thick.
 5. Stainless steel trim overall outside dimension of frame at surface to be nom. 707mm x 707mm to suit coursing of infil setts including joints nom 4mm.
 6. Granite flags 300mm coursed x random length (300-1100mm) x 90mm thick.
- Exact location of frame to be determined according to setting out of sett courses .
- Minimum 200mm stagger.



Trim (707mm)
Scale 1:20



MAIN, SIDE + PEDESTRIAN DOMINATED STREETS

	For approval
Albert Embankment	LBW
Vauxhall Cross	LBL
Nine Elms	TfL



4.1.16 TREE SURROUND TYPE 2

stainless steel collar and granite sett infil.

Nominal dimensions of granite infil area:
1800mm x 1800mm

To be infilled with granite sett paving 75mm coursed x 90mm deep x random lengths. Cropped sides. Joints to be sand filled flush to surface. Topped up as necessary.

Internal stainless steel collar:

707mm x 707mm x 90mm deep (to suit width of coursing of setts). Designed to be removed as the tree grows and setts removed.

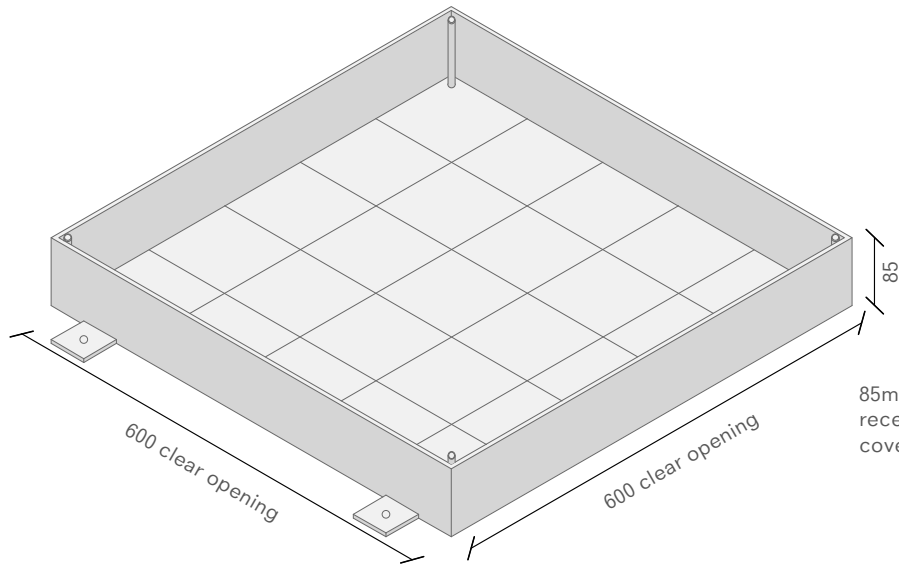
To contain loose, single size, gravel infil. Colour to match adjacent stone.

Finish to granite infil setts: Saw sides, crop top face.

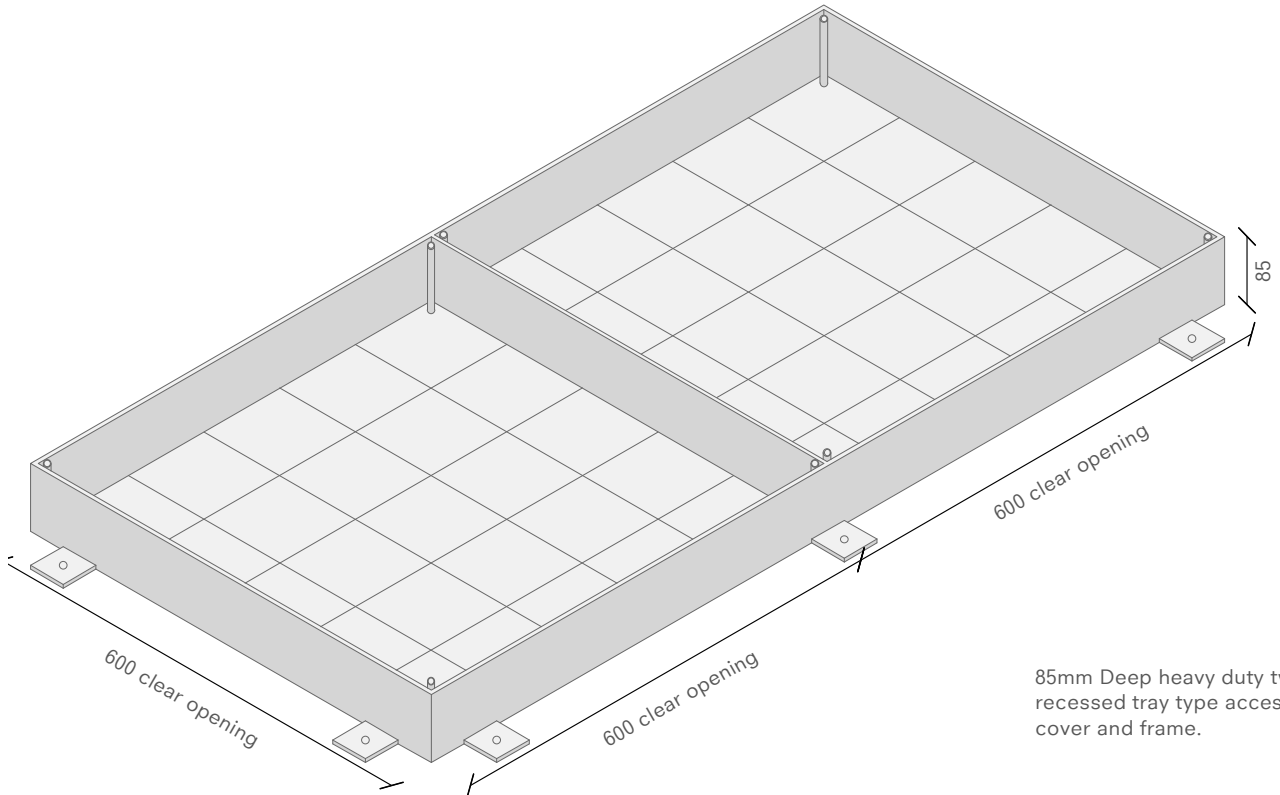
Watering and aeration stone to be located over tree pit and adjacent to setts.

Trees to Main Streets (TfL) to be London Planes (*Platanus x acerifolia*).





85mm Deep heavy duty recessed tray type access cover and frame.



85mm Deep heavy duty twin recessed tray type access cover and frame.



MAIN / SIDE STREETS

Nine Elms
Albert Embankment
Vauxhall Cross

For approval

TFL
LBW



4.1.16 SERVICE COVERS

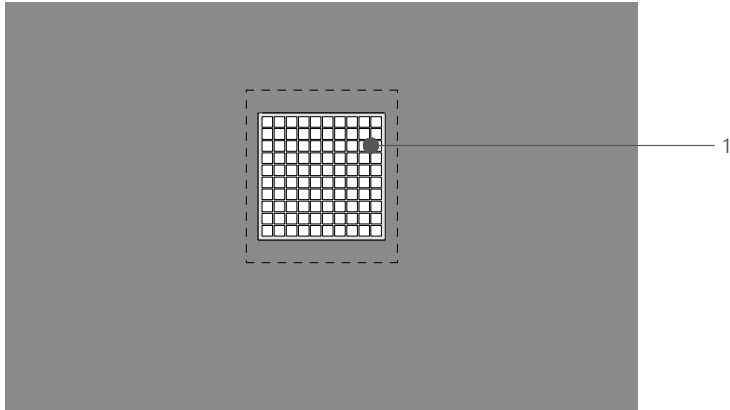
- Hot dipped galvanised finish to BS EN ISO 1461 as standard.
- Single and Twin Unit options as appropriate.
- Heavy Duty Recessed Tray Type with Infil Paving
- 85mm deep.
- To be rotated on site to be in line with coursing of adjacent paving.
- Flags to be cut to fit frame dimensions (range of standard and non-standard sizes available).
- To contain minimum number of flags within the frame size. This reduces number of cutting requirements and points of weakness in footway surface.
- Paving material - as appropriate to match adjacent surfacing:
- Granite flag as detail 4.1.1/2/3
- Sandstone flag as detail 4.1. 4.
- All frames to be lockable to prevent theft.

Product and Load rating:

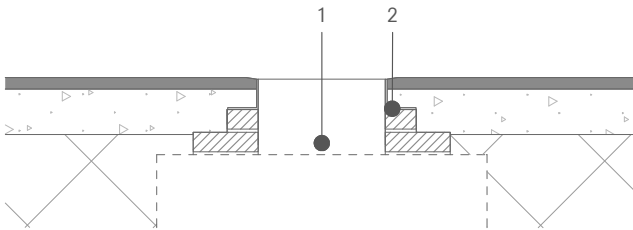
FACTA Class B 44 tonne GLW

Manufactured under IS 9001:2000 Quality System.

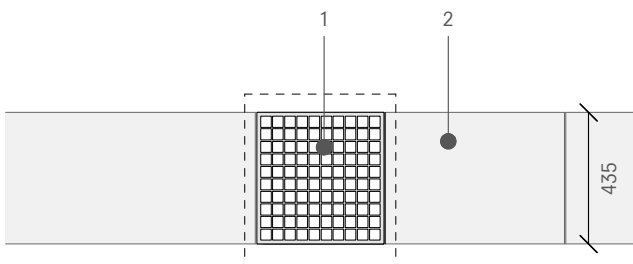




1. 420mm x 420mm D400 Heavy Duty Pedestrianised Grating.
2. Edge of adjacent surfacing to be 2-4mm proud of top of gully grating upstream and 2-4mm below top of gully downstream.

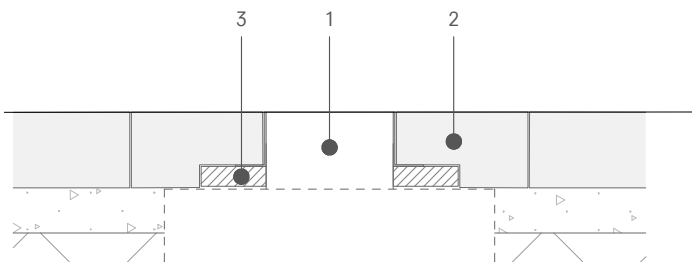


Gully Grating in Bitumen macadam



1. 420mm x 420mm D400 Heavy Duty Pedestrianised Grating.
2. Granite Flush Trim 435mm x random lengths (600mm - 1100mm) x 250mm Depth.

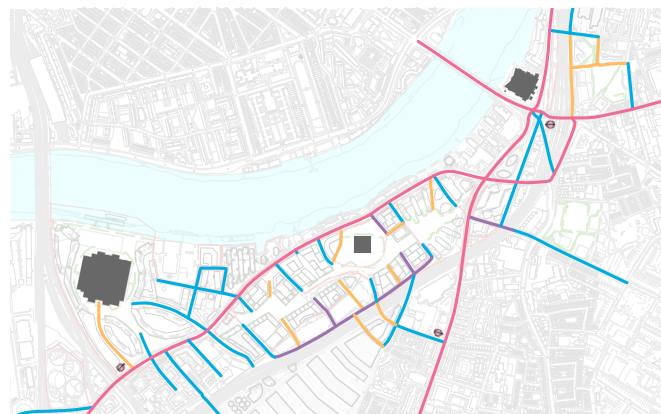
Granite Trim to be laid consistent with 5mm wide joints against grating frame. Edge of adjacent surfacing to be 2-4mm proud of top of gully grating upstream and 2-4mm below top of gully downstream.



Gulley Grating in Granite Channel

Trim to be notch cut adjacent gulley grating.

Gulley laid on engineering bricks.



MAIN / SIDE STREET

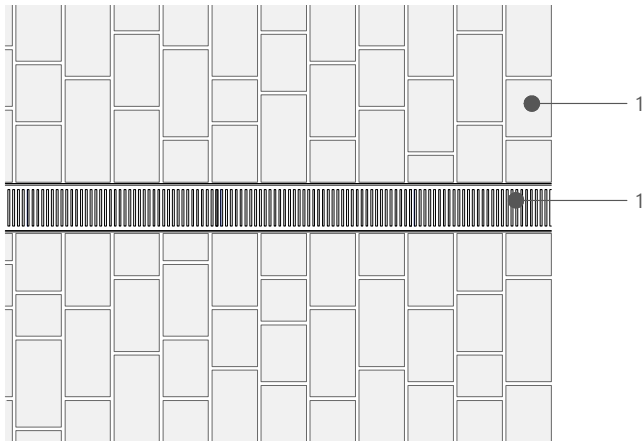
<p>Nine Elms</p> <p>Albert Embankment</p> <p>Vauxhall Cross</p>	<p>For approval</p> <p>TFL</p> <p>LBL</p> <p>LBW</p>
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4.1.17 GULLY GRATINGS

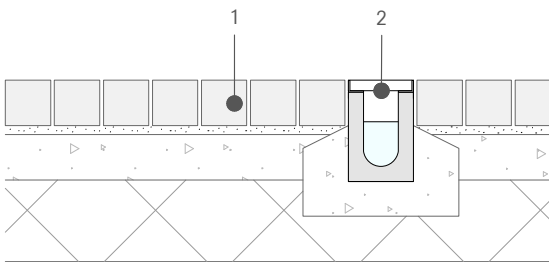


- Ductile iron (uncoated finish).
- Manufactured to BS EN 124 class D400
- Kitemarked for 3rd party assurance of quality.
- To comply with Design Manual for Roads and Bridges Vol 4, Section 2, part 5 HA/104/02.
- To be suitable for carriageway and fast moving traffic (BS7903).
- 40 tonne safe test load.
- Non rock captive reversible hinge for increased stability and silent operation.

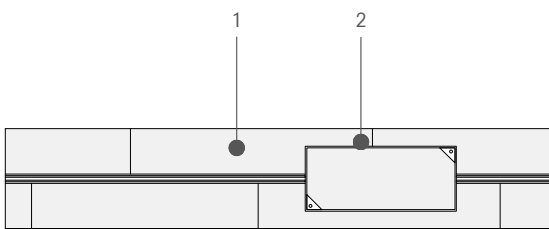




1. Granite Setts or flags 150, 300 or 600mm coursed.
2. Precast concrete Linear Drainage Channel with Cast Iron Ductile Grating and built in falls.



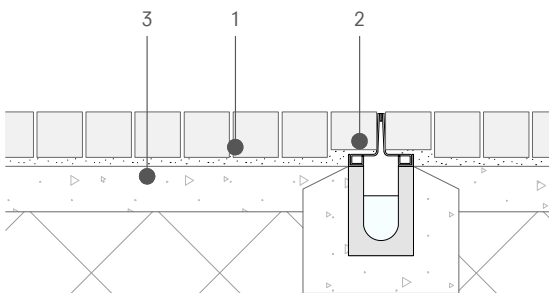
Linear Drainage Channel in
Granite Setts/Flags



1. Galvanised Steel Slot Drain with built in falls and recessed access covers. Nominal 20mm
2. slot opening and 150mm throat depth to slot.

C40 Concrete Base.

Granite Setts or Flags 150, 300 or 600mm coursed.



Slot Drain



SIDE + PEDESTRIAN DOMINATED STREETS

	For approval
Albert Embankment	LBW
Vauxhall Cross	LBL
Nine Elms	TfL

4.1.18 COVERED CHANNELS AND SLOT DRAINS



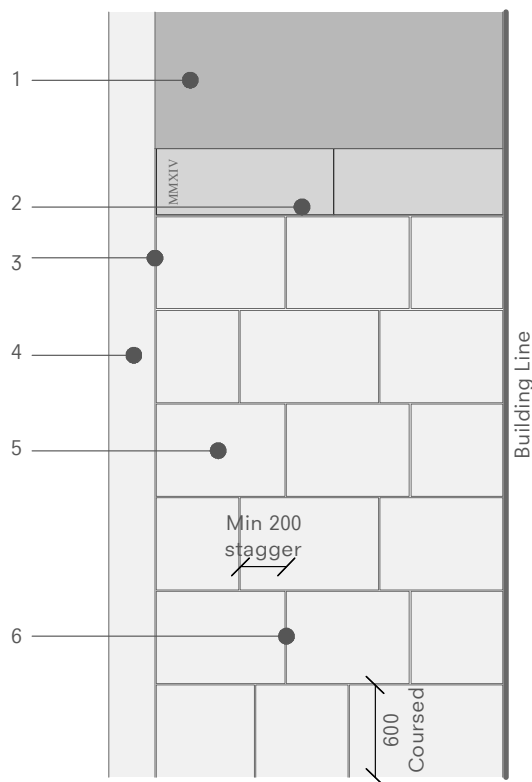
Covered Channel Grating (Adopted & Non-Adopted Areas):

- Ductile iron grating
- Manufactured to BS EN 124 class D400
- Kitemarked for 3rd party assurance of quality.
- To comply with Design Manual for Roads and Bridges Vol 4, Section 2, part 5 HA/104/02.
- To be suitable for carriageway and fast moving traffic (BS7903).
- 40 tonne safe test load.
- Non rock captive reversible hinge for increased stability and silent operation.



Slot Drain (Non-Adopted Areas):

- Slot drain to be galvanised steel or stainless steel.
- To be used with 100mm, 150mm and 200mm wide channels where applicable.
- Manufactured to BS EN 124 class , Class D400 loading capability.



1. Bitmac or similar material to tie in with adjacent surfacing.
2. 1100mm x 435mm x 300mm deep mm Granite End Stone with etched detail.
3. Flag surfacing to be laid with consistent joint against back edge of kerb. Edge of flag surfacing to be 5mm proud of top of kerb to avoid ponding.
4. 300 x 300 x 600-1100mm Granite kerb.
5. Granite flags 600mm coursed x random length (600-1100mm) x 65mm thick.
6. For widths and grouts refer to adjacent text.



MAIN / SIDE STREET

	For approval
Albert Embankment	LBW
Vauxhall Cross	LBL
Nine Elms	TfL

4.1.19 END OF PHASE GRANITE TRIM

SELECTION / FINISH OF STONE

Granite.

435mm w x 250mm x 600mm

Sawn to all faces, fine picked top.

Colour: Silver grey

Inscription: Water sawn etching of logo / date (inscription to be confirmed).

GREEN GUIDE 2008 RATING: A or B

PERPEND JOINTS

Stones to be laid end to end with an open unpointed 2mm joint (1mm min. to 4mm absolute max) between ends.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

- * Dimension (thickness/depth) to be confirmed by Engineer's specification following investigation of material properties and vehicle loading requirements, and sub-base construction, and compliance with relevant British Standard compliance.





PEDESTRIAN DOMINATED SPACE

	For approval
Albert Embankment	LBW
Vauxhall Cross	LBL
Nine Elms	TfL

4.1.20 ALTERNATIVE TACTILE PAVING

SELECTION / FINISH OF STONE

Granite. Bespoke tactile pattern upstand to paving unit to indicated change in surface or level as necessary to aid visually impaired. To be considered for use in 'Special Areas' as per Stone Control Panel, in Pedestrian Dominated Spaces as part of the detailed design process.

Colour: Subject to detailed design of adjacent materials.

GREEN GUIDE 2008 RATING: A or B

JOINTS

Joint width to match adjacent surfacing in width, colour and material. Max. aggregate size in jointing grout to be 2mm in any dimension. Joints to be fully packed with no air gaps or other impurities. Jointing grout to be cleaned completely from surface. To be applied when bed is cured sufficiently to prevent any movement of flags during application.

QUALITY OF SURFACE

Setts to be laid so as to achieve an even and smooth pedestrian surface to the approval of the CA. 1mm max. difference in level between any two adjacent setts at the common joint.

MORTAR BED, BASE, SUB BASE & FORMATION LAYER

To Engineer's specification to be in accordance with BS 7533:2006.

User Guide ¹

Introduction ²⁻⁴¹

Street code ⁴²⁻⁵³

Stone selection ⁵⁴⁻⁶⁷

Technical guide ⁶⁸⁻¹²¹

Maintenance ¹²²⁻¹²⁵

5

REQUIREMENT FOR MAINTENANCE

The implementation of new public realm constitutes a substantial investment of public and private funds into the town centre. The new schemes must be designed to be readily maintainable and then must be adequately maintained in order to protect the value of that original investment. If the new public realm is inadequately maintained, the quality of the environment and the facilities will degenerate and the value of the original investment will have been lost. The requirement for a wholehearted strategic commitment to properly funded management and maintenance cannot be overstated.

All elements of the scheme which fall within the area of existing or proposed adopted highway will be maintained by the Highway Authority and therefore must be designed and constructed to standards which are acceptable to the Highway Authority and formally approved in stages so that the Highway Authority can take on maintenance responsibility.



DESIGN FOR MAINTENANCE

One of the benefits of high quality public realm is a reduced requirement for repair. One of the challenges of high quality public realm is the care and attention which must be paid to any repair works and, particularly, to reinstatement following works by statutory service providers, as covered below.

The designers of the public realm must design out all unnecessary maintenance. The designers of each scheme should produce a detailed statement setting out all of the assumptions which they have made regarding maintenance. This is not a maintenance schedule but formal communication of all relevant issues and information from the designers to those with responsibility for maintenance of the public realm.

To this end the design engineer should consult with the Council's operational managers and engineers to ensure relevant issues are taken into account.



SERVICE PROVIDERS

One important (but often overlooked) function of the public realm is a route for underground services. These include rainwater sewers, foul sewers, electricity supply, water supply, gas supply, telecoms, cable tv etc. Broadly, there are two main issues here:

- The presence of these services can cause delay and expense to public realm construction if the surface levels are to be reduced or if the services are in unexpected locations or have inadequate cover
- When the scheme is complete, any excavations to access existing services or lay new services have great potential to degrade the public realm if the reinstatement is not properly managed

Procedures and dealings with service provider companies are governed by statutory legislation, The Roads and Streetworks Act 1991.

Seven approaches are outlined here to safeguard the future of quality public realm from the activities of service providers:

1. The service providers should be brought into the process at an early stage and at a strategic level. They should be advised of the overall plans and the surfacing details, so far as these are understood at the time. This will give them good notice to plan infrastructure work and sort out any of their existing plant which has sub standard or is otherwise defective. The experience of the current team is that they will not always take this opportunity but nevertheless they should be encouraged. The Highway Authority should continue to promote the active involvement of service providers and avoid a confrontational approach.
2. The management of the public realm must adopt a rigorous approach to policing reinstatement following excavations to access or install underground services. This should include inspections before and during reinstatement works and during / after the adoption period. The service providers are obliged to reinstate the surfacing to the previously existing quality. The Highway Authority should continue to assert its rights in legislation to ensure that the service providers do reinstate properly. Common experience indicates that they will not do this unless sufficient pressure is applied in each and every case. Failure to do that will result in a severe deterioration in the quality of the surfacing over time.
3. The Highway Authority should maintain a panel of contractors who have a proven capability to reinstate high quality public realm. This list should be shared with the service providers with a recommendation that these contractors should be used for reinstatement work. In extreme cases, the Highway Authority could commission the reinstatement work and countercharge the service providers.
4. The Highway Authority should issue to service providers a full set on construction information as necessary for reinstatement of surfacing. Particular attention should be paid compaction of backfill, the structural integrity of the slab / bed / jointing and the matching of the surfacing finish. These requirements should be discussed at a strategic level to encourage forward planning.
5. The natural stone surfacing materials will probably be subject to relatively long delivery periods and repairs will need to be in matching colours, sizes etc. Therefore it is recommended that each scheme provides a range of additional quantities of material to be stored for future maintenance following excavations by service providers etc. The details of this should be agreed with the Highway Authority as part of the design approval process. It is essential that the range of surfacing materials and construction techniques in the whole town centre is limited to a reasonably restricted palette so that the storage of reinstatement materials is manageable.
6. The relocation of existing services encountered is often a key delivery issue for public realm or developer public realm projects. It is advised that appropriate searches and actual physical site investigations are carried out in good time for services relocations to be costed, agreed, funded and carried out without causing delay and unbudgeted cost.
7. On completion of a highway project covered by this document the project should be entered onto a 'Streetworks Register' as a 'Special Engineering Difficulty'. In doing this a requirement will be placed on all streetworks promoters to take account of the requirements set out within this document and can include the necessity to contact nominated council officials prior to work commencing.

Next steps....

- Agreements from local councils and TfL
- Street Furniture Code
- Wayfinding
- Tree and Structure Vegetation Code
- Lighting Code
- Sustainable Drainage
- Park Code
- Security / counter terrorism / CPTED
- Cycling Strategy
- Routing of Utilities