Streetscape Guidance 2009

A guide to better London Streets

MAYOR OF LONDON

Transport for London

STREETS

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This document provides information on the design criteria and good practices to be followed when developing and implementing works on the Transport for London Road Network. It does not constitute legal advice. It is the responsibility of the implementing authority to satisfy itself that the relevant legislation, codes and standards are being complied with.

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1 Introduction

The Mission

‘To manage London’s streets better for people’

The Vision

‘The world’s best-managed streets for a world-class city’

1 Introduction

Purpose of the Streetscape Guidance

Streetscape Guidance for the Transport for London Road Network (TLRN) provides advice on streetscape improvements and the subsequent management of the TLRN.

The primary objective of the guidance is to enable those responsible for the TLRN to create excellent streetscapes through the application of specific design principles and the use of preferred materials and products.

The Guidance highlights relevant policies and guidance that have an impact on the quality of the streetscape. The Guidance will act as a 'gateway' to other local, regional and national good practice and examples, and be a source of information to those outside TfL.

A set of Streetscape Guidance details for the TLRN has been developed to illustrate how the principles contained within the Guidance are to be applied.

Streetscape Guidance is revised and updated as required to take account of other documents and standards currently in preparation or proposed by TfL or other pertinent organisations.

Structure of the Streetscape Guidance

Streetscape Guidance has three main sections:

Policy and vision sets the context of the TLRN within London's streets, highlighting the diversity of the network, the relationship with London's local authorities and TfL's responsibilities.

Technical guidance focuses on how the quality of the TLRN streetscape will be improved through the design process and the application of key design principles.

The guidance recognises the varying streetscape character across the network. A palette of materials and products is included, with advice on how alternatives may apply in special areas.

Each element of the streetscape is considered in more detail and guidance given on its use in relation in the creation of a high quality streetscape.

For each element of the streetscape, relevant design guidance and good practice is referenced.

Maintenance and management defines responsibilities for maintenance works on the TLRN, highlighting issues related to streetscape amenity and the obligations of utility companies.

Use of Streetscape Guidance

The guidance is a working tool for those within TfL with responsibility for managing and operating the TLRN. It will form the basis of streetscape maintenance and improvement briefs prepared by TfL and act as a guidance document for all design teams.

The Guidance will be a source of information on TfL's approach to streetscape management for officers within London local authorities and other stakeholder organisations.

Document control of the Streetscape Guidance

The Guidance is a controlled document. It will be subject to regular reviews to test its validity, update policies and revise guidance in the light of changing legislation, the conclusions of further investigation, improved knowledge, advances in technology and new guidance issued by TfL.

Guidance holders are encouraged to submit comments, supplementary information and changes to policy and practice to the Streetscape Guidance contact so that suggestions can be assessed for inclusion in the regular reviews.

Streetscape Review Group

The Streetscape Review Group (SRG) is responsible for ensuring compliance with Streetscape Guidance, for embedding the principles of Streetscape Guidance into relevant TfL projects and for approving revisions of the Guidance. It is also responsible for approving or rejecting requests for exceptions to the palette of materials.

The members of SRG represent the professions in TfL and Design for London concerned with streetscape issues. Whilst the SRG does not seek to replace the need to consult the relevant professionals during the project programme, it helps to ensure a complete multi-disciplinary and multi-modal approach to relevant TfL projects.

TfL project managers are encouraged to present projects of streetscape importance to the SRG at appropriate stages of projects to ensure compliance with Streetscape Guidance.

Associated actions

Following the issue of Streetscape Guidance 2008: A guide to better London Streets, TfL intends the following actions:

- Continue to publish good practice and excellent design of streetscapes across London drawing on the support of Design for London
- Continue discussions on highway initiatives with London local authorities and other stakeholders
- Monitor, review and trial innovative details, products and materials which meet both performance and visual criteria and record successes
- Continue to audit schemes to ensure compliance

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2 Policy and vision

2 Policy and vision

Streets as places – the Transport for London Road Network

Streets provide the setting for London's public face, the nation's history and future prosperity. London's range of streets and spaces has developed around the twin centres of the City of London and City of Westminster, and numerous urban villages. History and governance have created a patchwork of distinctive places, as well as extensive suburbs.

London's streets are routes to service the capital's economy allowing the circulation of public and private transport, delivery of goods and services, communications, gas, water, electricity and the removal of waste.

They are also places for people; where residents, workers and visitors interact. Within London, virtually all the streets perform a balance of these functions.

The TLRN has an overriding strategic transport function that relates to its role as a through route for the movement of goods and people. The TLRN accounts for only 5% of London's streets, but carries 33% of London's traffic.

Carriageway alignments and transport related street furniture emphasise the streets' arterial function, often to the detriment of overall streetscape quality.

As streets account for the greatest proportion of the public realm within London, their appearance has a significant impact on the quality of the environment. There has been an increasing awareness within government that improving the public realm is essential for people's quality of life and vitality of our urban areas.

TfL recognises that the vitality of London's streets is also a function of their role as a place, neighbourhood or destination; where the presence and activity of people is more related to the surrounding land uses than to the streets' arterial function. The use of the TLRN for local movements, especially in central London, is acknowledged. The land uses and activities either side of the TLRN continually vary, as does the intensity and frequency of pedestrian activity.

The 580km of the TLRN varies in scale from rural high speed dual three lane carriageways to single carriageway urban streets. The network passes through open countryside, dense residential areas, and centres of commercial, retail and civic activity. The combination of the streets' transport and place-making roles, together with the character of the surrounding land uses, creates a distinctive character for sections of the TLRN. These variations in streetscape character are more complex than traditional road hierarchy classifications, and need to be recognised when designing and operating the network.

The TLRN cuts across local authority boundaries, where policies and guidance on streetscape issues may differ to those of TfL. TfL works with the London local authorities in an effort to avoid potential conflicts.

TfL recognises the benefits to be gained from working in partnership with London local authorities and other key stakeholders, many of whom commented on the consultation draft of the Streetscape Guidance.

Transport for London's roles and responsibilities

TfL is responsible for planning and delivering the provision of transport facilities for all modes of transport in a coordinated and integrated way.

TfL is responsible for operating and improving conditions for all road users within its responsibility to deliver wider safety, serviceability and sustainability objectives.

TfL is responsible for the delivery of specific parts of the Mayor's strategic pledges through a series of initiatives and projects.

Further information on TfL can be obtained from the Transport for London website at www.transportforlondon.gov.uk

Transport for London Road Network

3 Design process

3 Design process

Design team

Excellent streetscape design requires careful attention to detail, a broad range of skills and a real understanding of issues, conflicts and needs. A range of skills is required in the design team; multidisciplinary design teams are therefore essential.

The terms ‘design team’ and ‘designer’ are used in Streetscape Guidance to describe both project teams and designers of specific areas of work. Irrespective of the size of the project or task, TfL advocates multidisciplinary working where advice is sought from relevant specialists to achieve streetscapes that are consistent with excellence.

The size and nature of projects will influence the method of procurement of the design team. Criteria for procuring excellent design teams need to be established for selective awards. Design teams should include:

- Design specialist (urban designer, landscape architect or architect) to translate the vision described in a brief and develop a design consistent with TfL’s Streetscape Guidance
- TfL Modal champions are to ensure road safety, bus priority, walking, cycling and accessibility objectives for the project are met. Modal champions are the project budget holders
- Highway engineer to ensure that design details are safe, durable and are practical to construct
- Traffic engineer to make certain that the transportation objectives are achieved and that TfL’s policies in regard to sustainable transport are included in designs
- Maintenance engineer to ensure that both the routine and longer-term maintenance needs of the project are considered. The maintenance engineer will also ensure that the proposed design takes account of health and safety
- Environmental Manager to ensure Mayoral and TfL environmental objectives are achieved. The Environmental Manager will also ensure that any adverse environmental impacts are identified and mitigated
- Street lighting engineer is needed in recognition that London is a 24-hour city. Street lighting needs to be designed to take account of aesthetics and technical performance
- Construction Design Management (CDM) coordinator to ensure that the design proposals comply with the CDM Regulations 2007
- Access consultant to advise on the design proposals in respect of the technical and functional design requirements of users, especially equality and inclusion target groups. Access consultants may also be required to complement site supervision to ensure that equality and inclusion issues are addressed, particularly where there are variations in the design specification
- Arboriculture and landscape manager to ensure existing trees and plants are retained and proposed trees and plants can grow to achieve the design intention
- Key stakeholders, including local authorities, police, emergency services and security advisers, who may have access or operational requirements which need to be accommodated in the design

TfL is taking steps to ensure that the requirements of the Disability Discrimination Acts are applied to the TLRN through audits and remedial action where necessary.

Section 17 of the Crime and Disorder Act 1998 requires design teams to do all that is reasonable to design out crime. All projects which impact upon the streetscape should seek to minimise crime to produce a safe and secure environment where people do not feel under threat.

Design teams should therefore achieve the best balance between designing out crime and the other key design principles. TfL’s Transport Community Safety Managers can provide advice to help design teams meet their duties under the Act.

Core functions of the design team will be to ensure consistency across the network in terms of user safety, serviceability and sustainability objectives.

Design for London

Design for London (DfL) has been established by the Mayor to support the delivery of well-designed projects across London. One of its key roles is to support TfL in its aim to deliver design excellence through membership of the Streetscape Review Group and as a key resource across the Greater London Authority Group. DfL should be regarded as a key collaborator to help to deliver TfL’s vision for the world’s best-managed streets for a world-class city.

Design process

A project inception meeting should be held to discuss team management procedures, composition of the design team, roles of members and terms of reference. The inception meeting should also be used to discuss the project’s vision, develop collective ownership and ensure that there is a unified understanding of the project’s objectives. The role of the project manager should be agreed at the project inception meeting. The project manager will usually lead the design team. If this is not the case, a chair should be appointed.

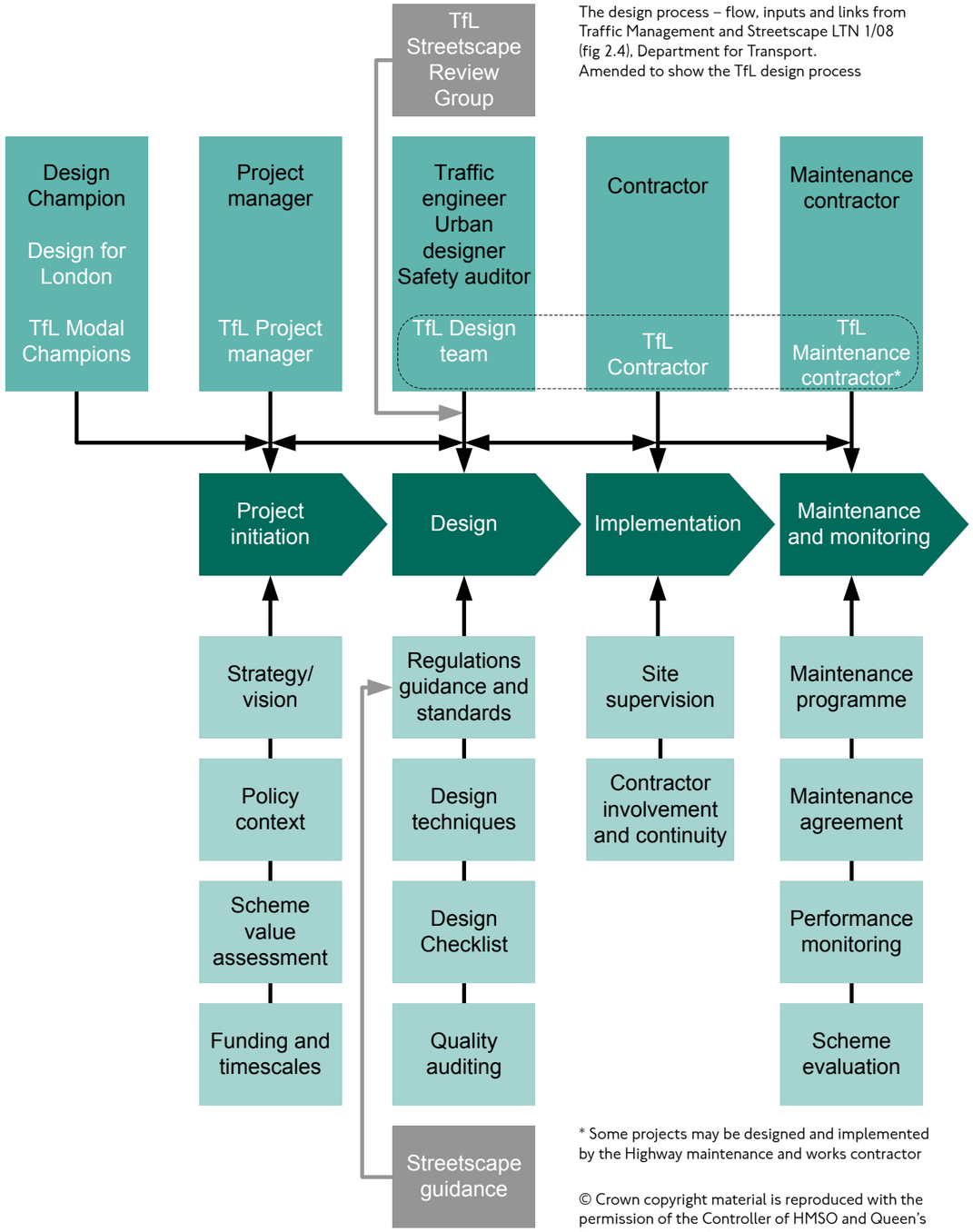
TfL should decide on the type and level of detailing required for the specific project. The use of Streetscape Guidance details will help to deliver the required standards and should also reduce the amount of time spent on the design process and reduce costs.

Streetscape Guidance details may not, however, be suitable for some projects and new details will need to be prepared. It is important to recognise that good detailing is vital to producing excellent streetscapes.

If new details are required, members of the design team should be appointed to draft new details for subsequent submission to TfL. The detailing of finishes and changes to surface materials are especially important.

An understanding of the procurement method is also important since it can affect the level of detailing required on construction drawings.

In the event that the contractor sub-contracts elements of work to others, extra care may be needed by site supervision staff during the works to ensure that excellence is maintained. Tendered contracts are likely to require more detailed drawings and could also require more supervision.



The design process – flow, inputs and links from Traffic Management and Streetscape LTN 1/08 (fig 2.4), Department for Transport. Amended to show the TfL design process

* Some projects may be designed and implemented by the Highway maintenance and works contractor

It must be remembered that the best designs can be ruined by poor workmanship and a lack of thought and supervision during construction. Where the works contractor is known, they should become a co-opted design team member. The contractor should be asked to comment on any problems they can foresee during construction at regular meetings.

The designer will need to ensure that appropriate health and safety measures have been taken in the design and specification process to satisfy statutory requirements.

Risks will need to be assessed and minimised. Key issues in the design of streetscape include manual handling of materials and dust inhalation in cutting concrete or stone. For example, manual handling of 600mm by 900mm paving slabs is not acceptable.

A likely outcome of the assessment of this risk is the avoidance of manual lifting of paving slabs through the specification of the use of mechanical lifts, or the specification of alternative sized materials (subject to SRG approval).

Similarly, exposure of worker and the public to the risk of dust inhalation from mechanical masonry cutting is not acceptable. Avoidance for the need to mechanically cut should be considered, as should the use of alternative, smaller sized materials (subject to SRG approval).

Alternative designs through the use of mixing material sizes should also be considered. Avoidance of dust inhalation risks can be achieved by specification of the use of local exhaust ventilation, water suppression (in the latter case slurry run off must be processed separately) or arranging for materials to be cut to fit off-site.

Streetscape Guidance exceptions procedure

If the design team propose to use materials or street furniture not compliant with the Streetscape Guidance Palette of materials or to implement alternative details, the project manager should request approval for the exception.

The project manager should contact the Streetscape Officer for an application for exception form which will be submitted to the Streetscape review group (SRG) for approval. The SRG may require detailed information including plans and details to make their decision.

All applications for exceptions are considered by members of the SRG and, where necessary, further advice is sought from TfL specialists outside the SRG. Decisions are recorded by the Streetscape Officer to inform future applications for exceptions and revisions of the Guidance.

Project design briefs

TfL is responsible for preparing design briefs for projects on the TLRN and other modal networks. Irrespective of the prime objective of the project, opportunities for streetscape improvements should be taken in accordance with the Streetscape Guidance.

More detailed and complex design briefs may require a number of skilled authors and time should be allowed for this in TfL programmes. Better quality information contained in a design brief will result in better understanding and timely completion in the later stages of the project.

The brief must communicate the project's objectives and vision to the design team. The vision can be described in either a detailed manner, when a very firm understanding of what the finished design must include, or in more general terms, when the design team needs to explore the potential of a range of solutions.

The design team is responsible for producing excellent designs which satisfy the brief. The design brief should make clear that a like-for-like replacement is not acceptable unless the existing provision is already world-class. The design brief should include the following:

- A statement of the vision for the project which will include the requirement for design excellence
- A statement of the objectives of the project. These objectives may be quite specific in terms of increasing footway space, the introduction of street trees or improving the amenity of the area covered by the brief, for example

  The objectives should also relate to the Mayor's strategies, policies, and initiatives such as accident reduction or increasing the use of specific modes of transport

  An objective should also be included that relates to the impact of the project on future maintenance needs
- Details of the Mayor's strategies, policies and initiatives that apply to the project. This must include the Transport Strategy and any Local initiatives that are pertinent to the design
- A statement of the constraints on the project. These constraints must include details of any transport or planning constraint, overall financial limits of the project, the geographic limits of the site, completion dates of any key tasks or work elements. Other constraints that will limit the design team's use of space or materials must also be given. TfL should also describe how any political constraint might affect the design process or outcome
- A statement requiring that the design team must include a qualified and experienced design specialist (urban designer, landscape architect or architect) who will be engaged in developing the streetscape proposals. The team must take specialist and expert advice in relation to access
- Requirements for equalities impact assessment. The team must take specialist and expert advice in relation to equality and inclusion
- Requirements for environmental impact assessment (EIA). The team must take specialist and expert advice in relation to EIA or environmental evaluation
- Requirements for wider sustainability assessment to incorporate equality impact assessment, strategic environmental assessment and health impact assessment
- Other specialist skills required should also be stated
- A statement of the likely procurement method of the works. If TfL can provide guidance to the design team on the likely method of procurement, should the project proceed beyond the detailed design stage, this should be included in the brief. This information will help the design team to understand how much detail needs to be provided on construction drawings and will affect the choice of materials or finishes
- A statement describing the deliverables. This statement must specify not only design outputs in terms of drawings but also any contract documents, technical specifications, consultation materials, reports or risk assessments that are needed by TfL
- Design teams must specify the construction process where they are unable to design out known risks
- Contractors must prepare a suitable method statements for handling heavy materials, control of dust and other health and safety issues
- A set of key dates for programming purposes
- A set of performance measures and milestones within the project. Note that performance measures will need to be monitored for effectiveness following scheme completion
- A statement describing TfL's requirements with regard to internal TfL and external liaison and approval processes which will depend upon the status of the project

Trials

Before being introduced to the TLRN, new types of equipment, techniques, products, materials, processes or services must successfully undergo trials as set out in TfL's procedure for trialling new products on the TLRN.

Reference

Greater London Authority:

- Commissioning a sustainable and well designed city. A guide to competitive selection of architects and urban designers, 2005

4 Key design principles

4 Key design principles

Introduction

To ensure that TfL continually improves the TLRN and helps London to maintain its role as a world-class city, consistency of approach and excellence of design and workmanship must prevail.

Whilst the provision of an accessible, safe and legible streetscape for all users is fundamental to the work of TfL, it must be combined with a desire to create streetscapes with a sense of generosity, robustness and beauty. Excellent, sustainable and inclusive streets can have a significant effect on people's enjoyment of life in London.

A set of key design principles that underpin TfL's vision to create the world's best managed streets for a world-class city should be applied across the network.

Sustainable design

TfL recognises that sustainable design makes a significant contribution to tackling climate change and protecting and enhancing the local environment.

A holistic approach

Those managing and operating the TLRN are aware that their individual actions have a direct impact on the TLRN streetscape. They are also aware that the TLRN is a significant part of the public realm within London and that other stakeholders have an interest in the role and appearance of the network. Individuals therefore need to be aware of a wider range of issues than their own particular specialism, such as:

- The relevant policy context and objectives of each of the TfL teams involved in street management and operation as well as local, regional and national initiatives
- The street's context in relation to its surrounding landscape and urban development, with emphasis on heritage and protected areas, buildings or other designations
- The street's function and appearance, not only as a transport corridor, but also as part of the local community and the activity and land uses on either side of the street corridor
- The process of street management and the differing pressures and priorities under which the various parts of TfL work. This includes protective security and the inter-dependency between organisations

Consistency and clarity

Through a consistent approach to the design and management of the TLRN, a sense of coherence will prevail over the network. By developing a design team approach and a palette of materials, the appearance and legibility of the TLRN will improve. The use of the palette and principles of detailing will create a safe, simple and quiet background to the activities of the street and adjacent land uses.

Integration and co-ordination

TfL works with London local authorities and London-based organisations to share information and provide a co-ordinated approach to the design and management of the capital's streets. This is to ensure that:

- Comprehensive area based improvement schemes can be implemented using the resources and skills of a wide range of partners
- Where appropriate, seamless streetscapes occur at administrative boundaries, avoiding abrupt changes in paving and street furniture materials and patterns

Improvement schemes are informed by wide range of stakeholders through co-ordination and a consultation process, thereby avoiding abortive work.

Understanding the requirements

Whilst the primary role of the TLRN is that of transport, the demands placed on the network by other users need to be understood and incorporated. If the needs of one user or activity cannot be accommodated within the street, the reasons and alternative actions must be fully understood by all. The prioritisation of needs will be more readily accepted where there is:

- A clear vision for the different parts of the TLRN
- Adequate time for meaningful consultation with the various stakeholders at the start of a project
- Ongoing consultation during the life of a project to address stakeholder concerns and develop opportunities
- Continual improvement of TfL practices through feedback from TLRN users and improved guidance

Design for people

Recognising that the TLRN is London's strategic road network designed to cater for the movement of vehicles, the network is also used by large numbers of pedestrians and cyclists. The needs of pedestrians and cyclists must be addressed by:

- Uncluttered footways and cycle tracks and lanes with street furniture placed in a co-ordinated and logical manner, and with redundant items removed
- Adequately lit footways and cycle tracks and lanes to enable pedestrians and cyclists to see and be seen
- Routes which have a clear purpose (ie, with a start and finish) and reflect desire lines
- Legible routes that are understandable, accessible and obvious by design, reducing the need for pedestrian signage. This includes achieving the most direct route, particularly where subways and footbridges are required
- Footways and cycle tracks and lanes that are free from obstruction, including parked vehicles
- Streets that are free from hiding places that facilitate crime and fear of crime
- At-grade, wide crossings set on desire lines with level changes for subways and footbridges avoided wherever possible
- CCTV coverage where appropriate in consultation with TfL's Enforcement Team, the police and local authorities
- Footways and cycle tracks and lanes that are comfortable to use, with even and well drained surfaces and places to rest

Reduction of crime and disorder

Design teams have a duty to ensure that all projects minimise crime and produce a safe and secure environment where people do not feel under threat. This should be done in conjunction with other key design principles to achieve the best balance.

Function and safety

The management of the streets must enable all users to use the space efficiently and safely for the purpose they are designed.

Designing and managing for function and safety should be done in conjunction with other key design principles, as described in Streetscape Guidance.

The design should:

- Ensure that vehicle speeds are appropriate for the surroundings, with controls being introduced where they are required
- Improve legibility so that the use of bollards, pedestrian guard rails, signs and road markings can be minimised
- Achieve a level of illumination that caters for the security needs of pedestrians and cyclists as well as the safety requirements of drivers

Recognition of local context and distinctiveness

Streetscape design must respect the character of the place through which the TLRN passes, not only the physical attributes of landscape and townscape, but also the activity, vitality and distinctiveness of the local community.

The design team should ensure the following:

- Streetscape enhancements that respond to local aspirations and do not compromise local distinctiveness
- The work on the TLRN integrates with the landscape, local ecology or built environment and respects local linkages and spatial arrangements
- Local heritage is respected. This includes statutory and local designations
- Functional requirements of activities and uses that take place either side of the street are integrated into the design of the TLRN streetscape

In order to recognise local context, alternatives to the palette of materials may be acceptable within special areas, subject to the approval of TfL's streetscape specialists.

Access for all

The public realm is a place where people have a right to 'pass and re-pass' on the public highway, which TfL has a duty to protect. This right must include people with mobility and visual impairments and any other disability.

The right of passage should also be extended to encourage the use of the public realm for increased social interaction, unless there are foreseeable safety implications. Particularly important is the creation of streets where:

- People of all abilities can access different modes of transport and change between them
- People can move along footways unhindered by street clutter, poor quality materials and inappropriately located obstacles
- Adequate lighting improves safety for all street users and especially for more vulnerable members of society
- Opportunities can be taken to enable people to interact socially on the street

Materials and maintenance

Adequate investment and continual care is necessary to ensure safe, serviceable and sustainable streetscapes. This can be achieved by:

- Using reputable, durable materials and construction details to ensure a long life span
- Choosing materials and designs that embody simple, ageless solutions for the TLRN to ensure that the street does not become a victim of short-term design fashion
- Using materials and products that are flexible to change, such as streetlight columns that can be adapted to take signs, signals and banners
- Reducing the number and variety of materials used
- Ensuring that existing streetscapes are managed and maintained to the appropriate standard
- Using materials which have been sourced with regard to their environmental impact
- Implementing GLA's responsible procurement policies

5 Palette of materials

5 Palette of materials

Introduction

A palette of materials and products has been developed for the TLRN. The palette reflects the consistent approach to the quality of materials and products across the TLRN. It embraces and therefore supersedes all previous streetscape advice and guidance by TfL's predecessor organisations.

Options are given where there is a potential for variation to respect local character. Design teams may recommend alternatives to the palette for use in special areas; otherwise, design teams will be required to use the palette.

Confirmation of special area status and the variation of the palette must be approved by TfL's Streetscape Review Group.

The street furniture items shown in the palette of materials shows design intent rather than specific products. The dimensional requirements are mandatory and have been specified on advice from TfL accessibility advisors. The design team should check specifications with manufacturers and select products that resemble the design shown.

Finishes

The following applies to all metal components of street furniture. This includes furniture on footbridges and in subways.

Colour:

Urban areas in central London (highlighted area on map):
RAL9005 (black) in matt micaceous iron oxide with an RAL7004 (signal grey) visibility band.

Other urban areas, suburban and suburban rural fringe areas:
RAL7004 (signal grey) or equivalent in matt micaceous iron oxide with a RAL9005 (black) visibility band.

RAL 9005
Black

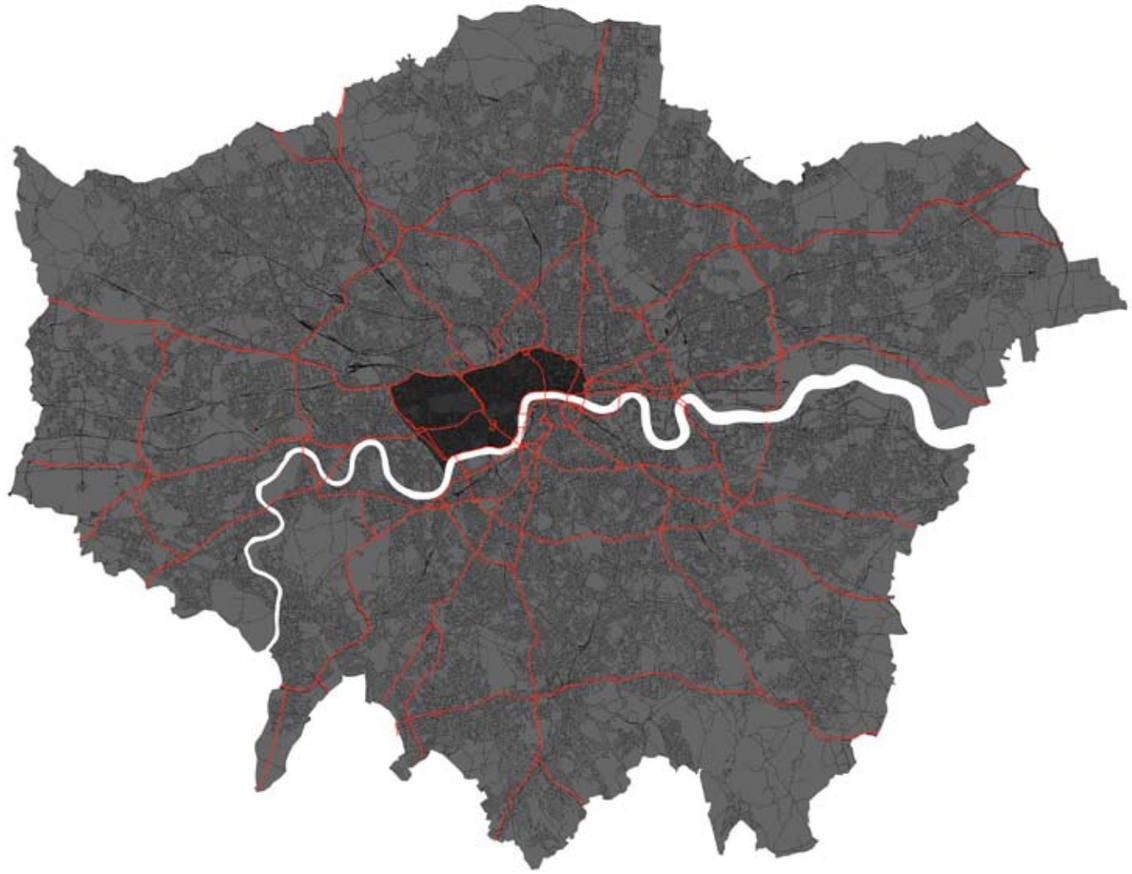
RAL 7004
Signal Grey

Visibility:

Visibility bands are required on all street furniture in areas of high pedestrian flows, with the exception of pedestrian guardrails, seats and wooden bollards.

Special finishes and coatings:

Low profile, clear, anti-poster finish is recommended in areas where fly-posting and graffiti are problems. This coating should be applied up to a height of 3000mm on street lighting columns.



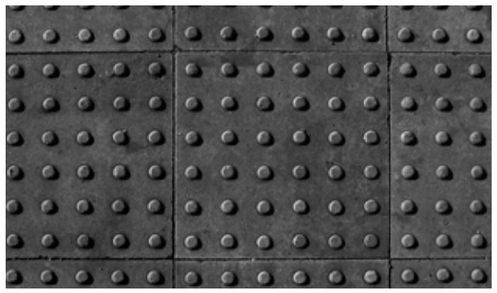
Material	Options	Streetscape Guidance references
Footway		
Concrete flags 900x600x65m Grey (natural)	Yorkstone flags 900x600x65mm Fine Picked	TfL/SG01, SG04, SG05, SG06, SG07, SG08, SG09, SG10, SG11, SG12, SG13, SG14, SG15, SG16, SG17, SG18, SG21, SG24, SG25, SG26, SG28, SG29
	Granite flags 900x600x65	
Asphalt		
Tactile Paving		
Concrete blister paving 400x400x65mm Red at controlled crossings	Concrete blister paving 400x400x65mm Grey (natural) in conservation areas	TfL/SG01, SG02, SG03, SG04, SG05, SG06, SG07, SG08, SG09, SG10, SG11, SG12, SG17, SG18, SG22, SG25, SG26, SG27, SG28
Concrete blister paving 400x400x65mm Charcoal grey at uncontrolled crossings		
Concrete ladder paving 400x400x65mm Charcoal grey		
Concrete Tramline paving 400x400x65mm Charcoal grey		
Concrete corduroy paving 400x400x65mm Charcoal grey		
Side road entry treatments		
Asphalt With kerbs as restraints	Asphalt No kerbs as restraints	TfL/SG08, SG09, SG10, SG11, SG28

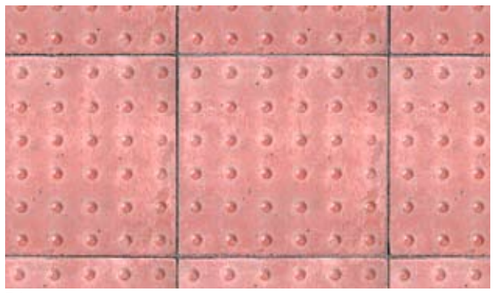

Concrete flags

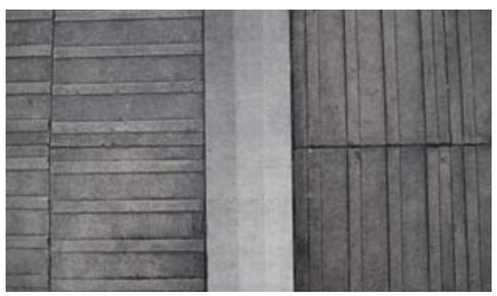

Yorkstone flags


Granite flags


Asphalt footway


Blister paving


Blister paving


Ladder and tramline with raised delineator


Corduroy paving

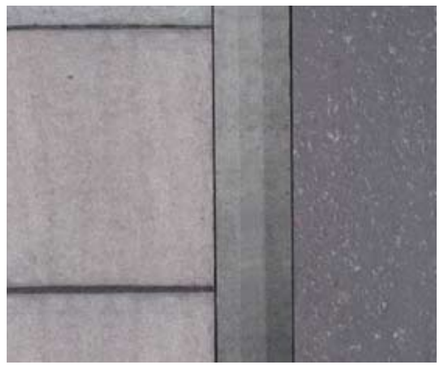
Material	Options	Streetscape Guidance references
Kerbs		
150mm granite kerb Fine picked straight and radiussed Silver grey at crossings as required	150mm concrete kerb Straight and radiussed	Kerbs and drainage, TfL/SG01, SG06, SG07, SG08, SG09, SG10, SG12, SG13, SG14, SG19, SG23, SG24, SG25, SG26, SG28, SG29
300mm granite kerb Fine picked straight and radiussed Silver grey at crossings as required	300mm concrete kerb Straight and radiussed	
Silver grey fine picked at controlled and uncontrolled crossings		
Granite safety kerb	Concrete safety kerb	Kerbs and drainage, TfL/SG25
Shaped granite kerbs and other specials		At-grade pedestrian crossings, TfL/SG02, SG03, SG19, SG20, SG27
Cycle tracks		
Asphalt with green pigmentation (BS381C – Colour 267 deep chrome green) adjacent to asphalt footway		Cycle lanes and cycle tracks, TfL/SG04, SG05, SG10, SG11
Asphalt – no pigmentation adjacent to concrete flag footway		
Concrete raised delineator blocks 400x200x65mm, grey (natural)		
Cycle lanes		
Asphalt with green pigmentation (BS381C – Colour 267 deep chrome green)		Cycle lanes and cycle tracks
Asphalt – no pigmentation		
Shared surfaces		
Asphalt	Paving flags	Cycle lanes and cycle tracks, Footway surfaces, TfL/SG04, SG05, SG10, SG11
Bus Lanes		
Asphalt with red pigmentation (BS381C – Colour 1434 Venetian red)	Asphalt – no pigmentation	Bus lanes

150mm granite kerb

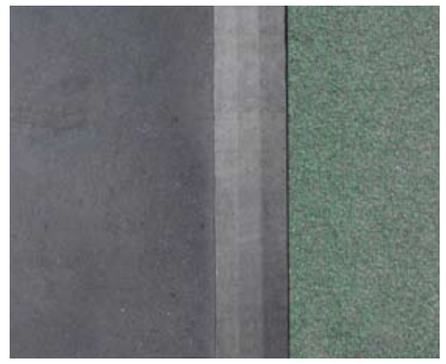
300 mm granite kerb

Granite safety kerb

Radiussed granite kerb



Black cycle tracks



Green cycle tracks

Seats

Seats are to be of a simple contemporary design which meets the dimensions shown this must include a bold side profile.

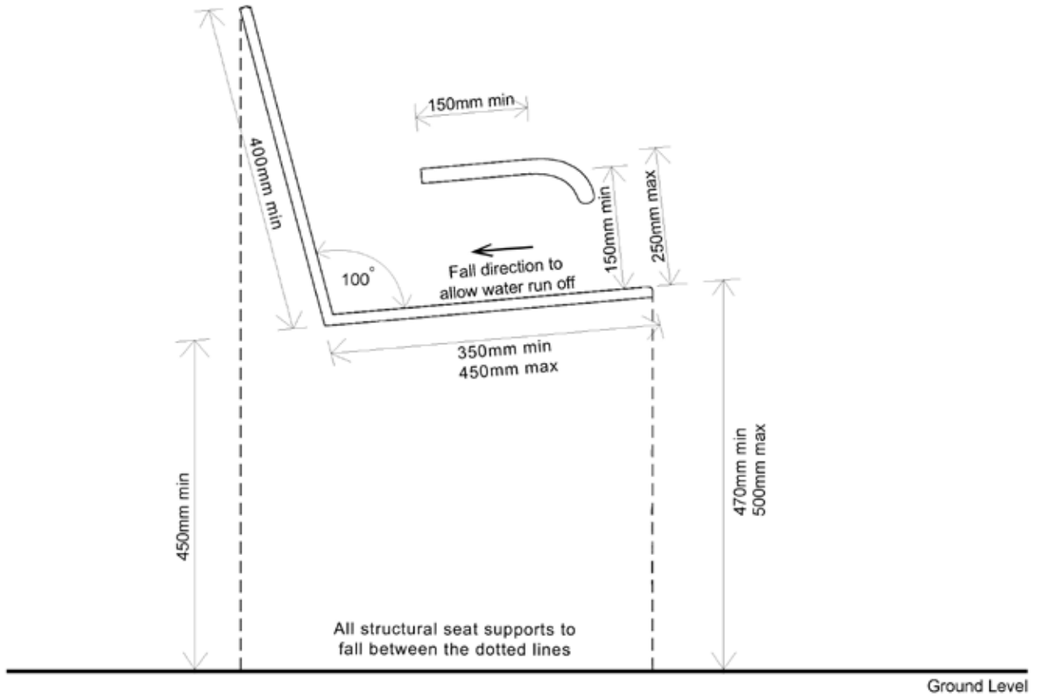
The dimensional requirements are mandatory and have been specified upon advice from TfL accessibility advisors.

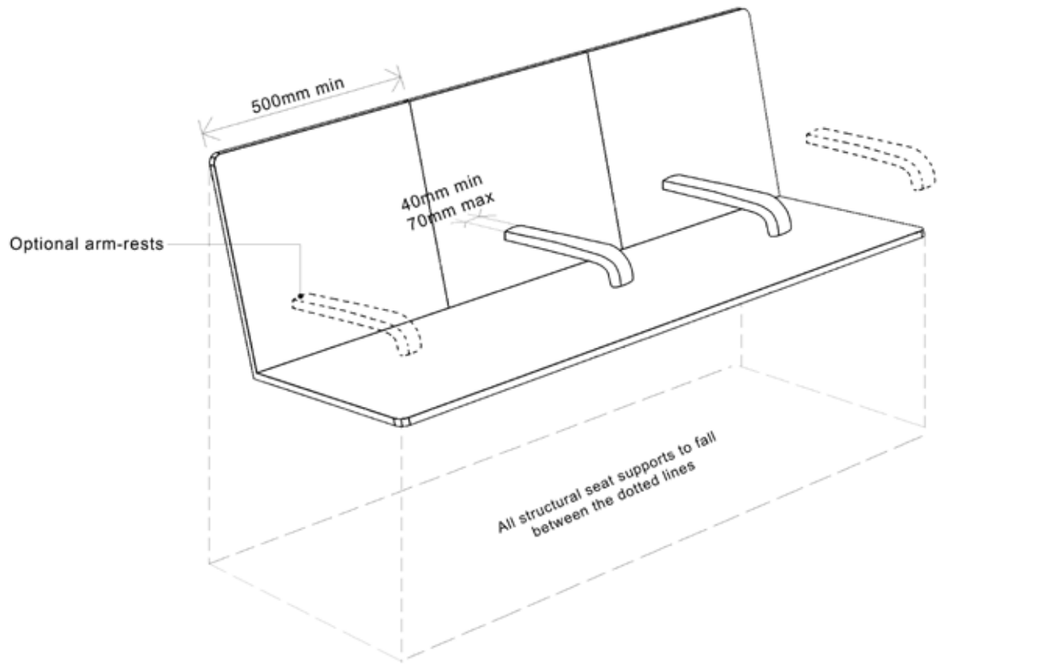
Seats must have armrests of circular cross-section.

Armrests may be omitted from ends of seats to aid wheelchair users or parents with pushchairs. The ends of armrests must be rounded if not connected to the seat.

Seat supports may vary but must not have visible base plates or extend beyond the profile of the seat to create a trip hazard.

Timber is preferred but metal alternatives may be appropriate in some areas. Other sustainable materials will be considered as an exception. Timber must be accredited to the FSC standard or equivalent.





References

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Streetscape Guidance:

- Technical guidance: Street furniture, Seats

Streetscape Guidance details:

- TFL/SG15 and SG16

Street lighting

Luminaires:
All luminaires must meet the performance requirements of BS 5489-1 and BS EN 13201

TfL intends that luminaires should be of a simple design with smooth lines and slim profiles. The colour of the luminaire housing should match the column.

Those illustrated represent those which currently meet performance requirements and are closest to TfL's aspirations. The appearance of option A is preferred.

Columns:
Tapered (preferred) and standard columns are both acceptable on the TLRN.

Visibility bands may be required in areas of high pedestrian flows.

References

Streetscape Guidance:

- Technical guidance: Street furniture, Street lighting

Streetscape Guidance details:

- TfL/SG02, SG03 and SG23

Cycle parking

Cycle parking stands are to be ‘Sheffield’ type, usually incorporating a tapping rail.

Widths between stands must be a minimum of 1000mm (ideally 1200mm). Cycle stands must be a minimum of 600mm from the kerb edge.

Refer to Streetscape Guidance details TfL/SG15 and TfL/SG16 for bicycle parking and paving flag alignments which minimise cuts to paving flags.

Options:

- Nylon coated with visibility band
- Stainless steel with visibility band
- Galvanised steel with visibility band (where appropriate and by agreement with Streetscape Review Group)

Cycle stands in black

Cycle stands in grey

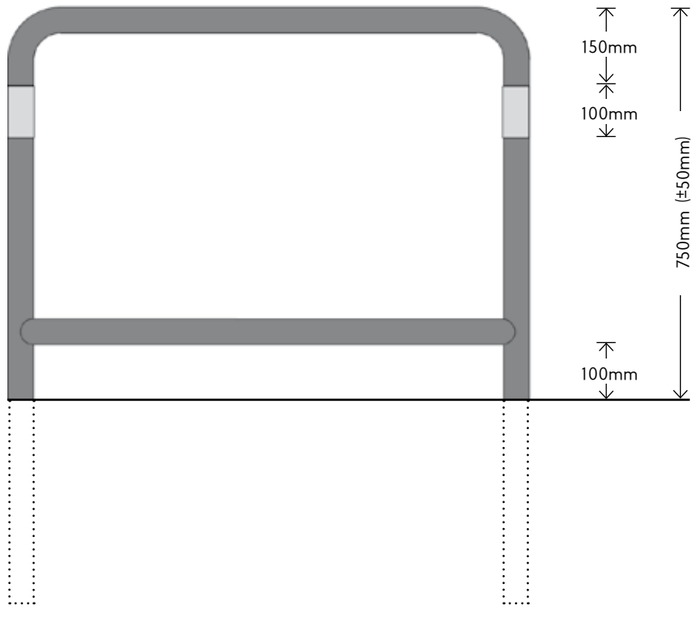
References

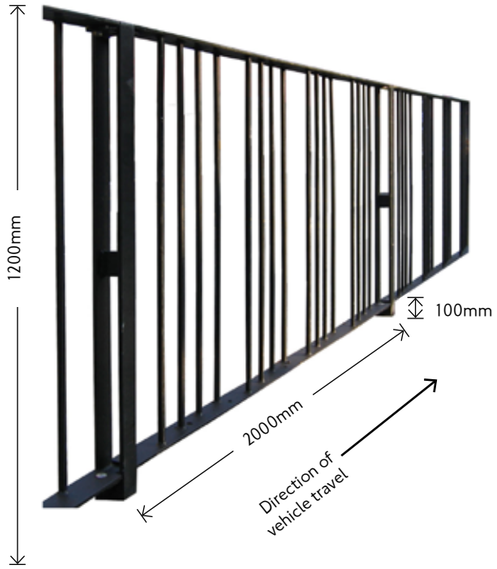
Streetscape Guidance:

- Technical guidance: Street furniture, Cycle parking facilities

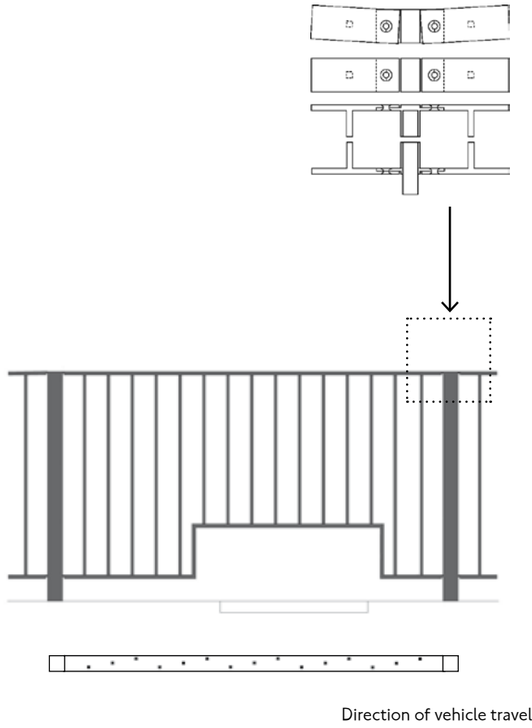
Streetscape Guidance details:

- TfL/SG15 and SG16

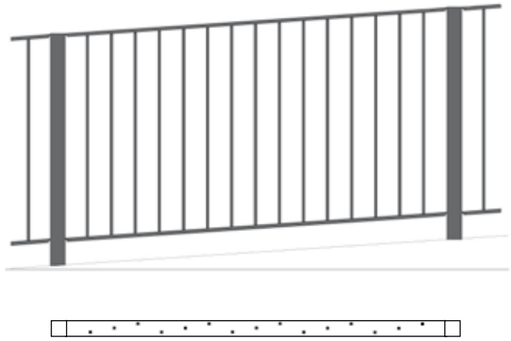




Pedestrian guardrail



Guardrail over inspection cover



Guardrail on inclined footway

Pedestrian guardrail

Guardrails must contain offset verticals to enhance visibility of pedestrians.

Panels must be screw-fixed to posts, not welded, to facilitate replacement.

All fixings to be countersunk and flush.

References

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges, Volume 2, Section 2, Part 8, BD 29/04 Design Criteria for Footbridges
- Design Manual for Roads and Bridges, Volume 5, Section 2, Part 4 TA 91/05: Provision for Non-motorised Users

Streetscape Guidance:

- Technical guidance:
  Street furniture, Pedestrian guardrails

Streetscape Guidance details:

- TfL/SG03, SG07, SG15 and SG27

Pedestrian direction signs

Where pedestrian or cycle routes cross the TLRN, borough designs for pedestrian direction signs may be appropriate to aid legibility.

For stand-alone pedestrian direction signs on the TLRN, or where borough designs are not considered appropriate, signage is to be of a simple contemporary design as shown.

All pedestrian direction signs erected on the TLRN must comply with the Traffic sign regulations and general directions.

The minimum clearance on cycle routes is 2400mm and on equestrian routes is 2800mm.

References

Department for Transport:

- Traffic Signs Manual, Chapter 1

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges: Volume 6, Section 3, Part 5 TA 90/05:
  The Geometric Design of Pedestrian Cycle and Equestrian Routes

Transport for London:

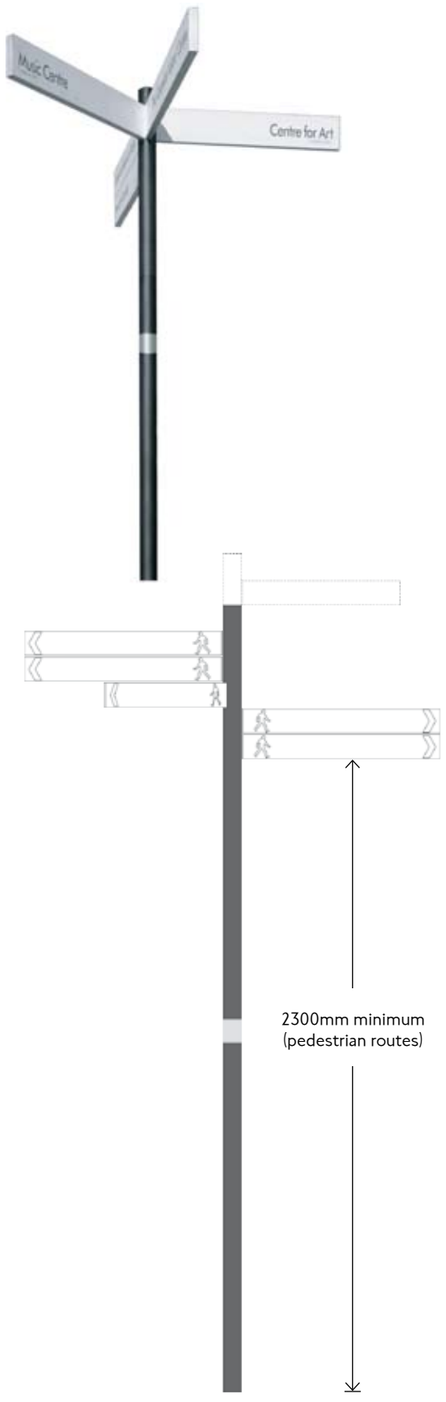
- London Cycling Design Standards, 2005

Streetscape Guidance:

- Technical guidance: Street furniture, Pedestrian direction signs

Streetscape Guidance details:

- TfL/SG15



Legible London

Legible London is a spatial wayfinding system which attempts to break London down into walkable areas and hence develop mental mapping. The key principles of this approach are:

- One system to learn and remember
- Supplying the right amount of information at the right time
- Connecting areas, regions and transport systems
- Fewer signs
- An effective high quality system which benefits from economies of scale in purchasing and maintenance

Spatial wayfinding offers the user more interpretive information and provides flexibility in an urban setting.

The Legible London project uses progressive disclosure to support the development of mental mapping and hence confidence to navigate journeys on foot.

The power of the system lies in a consistency of approach to area and neighbourhood nomenclature across London.

As the system evolves the data would be made available to authorities and developers to ensure consistency.

However, as Legible London is a wayfinding tool, it is not intended that the system would censor the provision of localised information (eg, town centre shopping maps) where it is more timely or relevant to produce this at a very local scale.

Further work on the prototype and subsequent pilots will establish the interfaces between such localised information and the framework of walking wayfinding.

Further information on the Legible London project can be obtained from walking@tfl.gov.uk

Traffic bollards

Option A (externally illuminated) is preferred design for urban areas. Refer to Streetscape Guidance details TfL/SG20 for fixing details.

Option B (internally illuminated) is more appropriate for higher speed routes in suburban and suburban-rural fringe areas.

Option C (unlit) is retained as an option to be used within 20m of a traffic signal, provided that the bollard faces in the same direction and is on the same island as the traffic signal.

References

Statutory Instruments:

- Traffic Signs Regulations and General Directions 2002

Department for Transport:

- Traffic Signs Manual

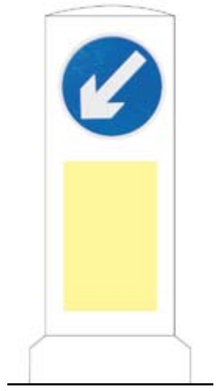
Streetscape Guidance:

- Technical guidance:
  Street furniture, Traffic signs

Streetscape Guidance details:

- TfL/SG02, SG03, SG04, SG20 and SG27

Option A



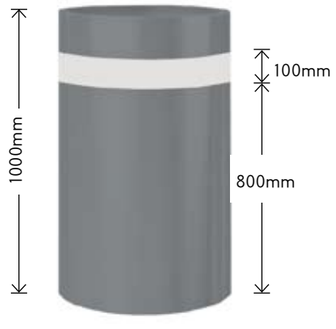
Option B
(Must be used on high speed road)

Option C

Litter bins

Litter bins are usually provided by local authorities.

TfL require litter bins placed on the TLRN to be robust, functional and of a simple design as shown, although variations in terms of size and style are acceptable. In some areas, bins may also have to be blast-proof if recommended by security advisers.



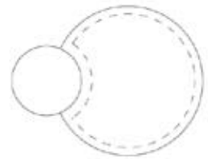
References

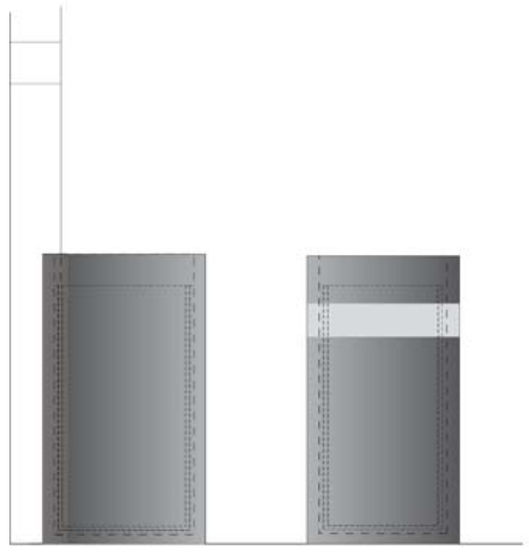
Streetscape Guidance:

- Technical guidance:
  Street furniture by third parties, Litter bins

Streetscape Guidance details:

- TfL/SG15 and SG16





Bollards

Bollards are to be tapered.

Diameter and fixing detail will depend upon material, safety and security requirements.

Wooden bollards in suburban and suburban rural fringe areas for grassed verges. Visibility bands are unnecessary on bollards on grassed verges. Timber bollards must be made of sustainably sourced timber.

Bell bollards may exceptionally be required where over running is a problem at side road junctions. In isolation, bell bollards present a trip hazard and must only be used in conjunction with other street furniture (eg, high visibility post)

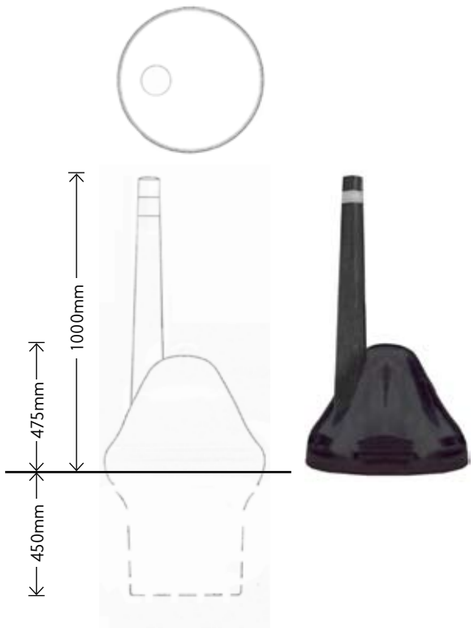
References

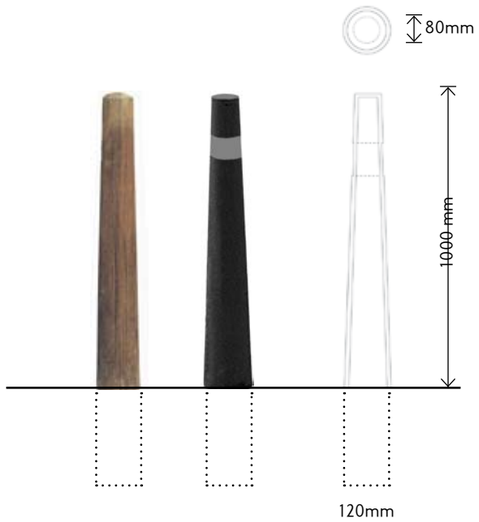
Greater London Authority:

- The GLA Group Responsible Procurement Policy

Streetscape Guidance:

- Technical guidance: Street furniture, Bollards





Streetscape components

Introduction

When applying the key design principles to the TLRN, there are certain streetscape design objectives that are common to all character areas. By looking at the street as a series of inter-related components, these common design objectives can be applied across a typical street.

Detailed advice, including general location principles, is given in the Technical Guidance section.

The highway boundary

The quality of the highway boundary, adjacent buildings, landscapes and land uses has a significant visual impact on the TLRN. If they are of poor quality, TfL should endeavour to enhance the streetscape by:

- Ensuring that boundaries within their ownership are well designed and maintained
- Working with local authorities and landowners to improve the quality of environment outside the highway boundary
- Taking account of safety and security issues in consultation with security specialists

When carrying out boundary works, the design team should also take account of views from the TLRN to landmark buildings and surrounding landscapes.

The carriageway

The carriageway makes up a large visual component of the TRLN and therefore has a significant visual impact on the streetscape. The design team should ensure that:

- The visual simplicity of the carriageway is maintained by keeping different coloured surfaces to the minimum required for the effective demarcation and operation of bus and cycle lanes

The kerb

The design and quality of kerbs has a substantial effect on the streetscape and requires careful attention. The design team should ensure that:

- The kerb alignment is consistent and follows smooth and flowing lines to provide strong definition between footway and carriageway. Kerb buildouts and the creation of service or parking bays should relate to the building form and function
- Kerb lines should be formed with radiused kerbs in preference to mitred kerbs
- Kerbs should be carefully detailed and, where necessary, special elements designed and ordered

The footway

Pedestrian access along footways should be facilitated by:

- Maximising footway space where possible and when appropriate
- Ensuring high quality surfaces with consistent joint alignments, no unsightly mortar infills and simple combinations of materials
- Ensuring high quality footways and well drained surfaces, free of trip and slip hazards
- Creating a legible hierarchy of paving materials that visually locates pedestrian, cycle and vehicle priority areas
- Continuing footway paving material across vehicle crossovers

Highway-related street furniture

When locating highway related street furniture the design team should ensure that:

- The amount of signage to enforce the regulations is sufficient but is not excessive in terms of numbers and size of signs
- Key views and landmark buildings are not obstructed by poorly located street furniture, unless there is an unavoidable safety or security need
- Clear pedestrian routes are maintained by removing redundant furniture and locating new furniture outside pedestrian desire lines
- Clutter is reduced by combining elements of street furniture, such as signals and signs on street lighting columns, and by mounting street equipment on buildings or structures wherever it is safe and acceptable to do so
- The highway street furniture elements are co-ordinated with pedestrian street furniture and other streetscape elements
- Street furniture in central reserves is kept to a minimum
- The scale and bulk of highway street furniture is minimised to reduce visual intrusion where it is safe to do so
- New street furniture is readily detected by visually-impaired pedestrians, through the effective use of contrast
- The juxtaposition of TRLN and local highway authority street furniture on side roads is co-ordinated to minimise clutter and visual confusion
- The extent and visual impact of safety fences and barriers is reduced to the minimum required for safety and security to lessen visual impact and severance effects
- Street lighting does not undesirably spill into neighbouring residential properties or cause light pollution

Pedestrian related street furniture

When locating street furniture for the benefit of pedestrians, design teams should ensure that:

- Footways are not obstructed so that pedestrians of all abilities can move along the street independently and unhindered
- Pedestrian guard rails are only used where there is a proven safety requirement to ensure minimum visual intrusion and physical severance
- Pedestrian information and signage is provided where necessary on the TLRN to aid pedestrians to locate local facilities and public transport
- Seats are provided at regular intervals (50m is desirable) along the footway to assist less mobile people to use the streets more easily and to encourage the use of public space
- There is good quality lighting on the footway to improve the use of streets at night

Planting

When choosing plant species, the key considerations are the right species for the right place and user safety.

Design teams should refer to Connecting Londoners with trees and woodlands, a tree and woodland framework for London, March 2005 and Right trees for a changing climate, November 2007.

Design teams should take account of:

- Site conditions to ensure successful establishment and growth
- The surrounding landscape and its ecology to ensure the integration of planting schemes with the established vegetation and landscape character, using locally native species where appropriate
- The space available to allow trees in particular to develop to their mature size without adversely affecting adjacent properties
- The growth habit and maintenance requirements of the proposed species, taking account of operational health and safety requirements such as the need to prevent vegetation overhanging footways and cycleways

Street tree planting should take place where appropriate to reduce the apparent scale of the TLRN and visually enhance the streetscape.

To ensure the feasibility and long-term success of planting schemes design teams should:

- Obtain detailed information on underground services and structures before attempting to locate new street trees
- Co-ordinate tree planting with street furniture, allowing for future growth
- Carry out tests to ensure that the existing soil and subsoil conditions will support plant establishment and growth
- Ensure that maintenance access is possible and that resources exist to maintain the trees in the long term
- Take account of potential nuisance caused by leaves, fruits, insects and birds

Public transport facilities

To encourage the use of public transport TfL intends that:

- Bus stops are sensibly located and accessible
- Bus stops and shelters are fit for their purpose, durable materials are used and are well maintained
- Access to transport interchanges is integrated with the street

Crossing facilities

TfL intends to provide at-grade crossings of the TLRN in preference to footbridges and subways wherever possible and appropriate. Where safety and traffic priorities permit, the design team must ensure that:

- They are located with due regard for pedestrian desire lines and accessibility
- Adequate space is provided for the volumes of pedestrians and cyclists using the crossing
- The amount of pedestrian guardrails and other street furniture associated with the crossing is kept to the minimum required for safety

Where footbridges and subways across the TLRN have inadequate access for people with mobility impairment, or are of poor quality, the design team should:

- Design improvements to create a more pleasant and safe environment for the intended users
- Ensure there is adequate lighting and pedestrian signage

References

Greater London Authority:

- Connecting Londoners with trees, 2005
- Right trees for a changing climate, 2007

6 Streetscape character

6 Streetscape character

Introduction

The TLRN is the strategic road network for London and varies in character across the capital. The variation of the land use across London must be taken into account when designing the streetscape. Whilst common design principles, as previously described, can be used across the network, it is important to vary their use in each design to respect the context of the street.

Streetscape character areas

When the environment of the TLRN is considered in detail, it can be refined to reflect the variations in building density, land use and activity either side of the highway.

To help illustrate these variations and how designs can respond appropriately, TfL has identified five streetscape character types that occur across the TLRN. These are as follows:

- Urban civic, retail and commercial
- Urban residential
- Suburban commercial and industrial
- Suburban residential
- Suburban and rural fringe

The photomontages that follow illustrate the types of changes that could be made to improve the streetscape within different streetscape character types. It is not necessary for design teams to identify streetscape character types.

Special areas and features

Streetscape Guidance promotes a quiet backdrop to the activities on the street and the adjacent land uses. While the palette of materials represents the 'standard' for the TLRN, TfL recognises that some sections of the network may become 'special areas' when an argument has been accepted that some streetscape elements should be varied.

There are a number of areas and features that occur on and adjacent to the TLRN which are of such particular character that, in some cases, it will be appropriate to vary elements of the streetscape palette in response to the special character of these places. These are referred to as 'special areas'. These may include:

- Transport interchanges
- Town centre high streets
- Special security measures
- Open common and parkland

Specific regulations, policy and guidance may also apply in some cases, such as:

- World Heritage Sites
- Conservation areas
- Scheduled ancient monuments
- Listed buildings
- Nature conservation areas

It is important to balance the case for variation with the case for calmness and consistency and to take account of cost and maintenance requirements.

The Streetscape Review Group will confirm the classification of special area status and the suitability of variation to the streetscape palette in response to the characteristics of place as recommended by the design team.

Examples of areas where there may be a case for variation follow. Whilst the list is not exclusive, they represent the most likely examples that design teams will encounter on or adjacent to the TLRN.

Transport interchanges

Transport interchanges help to provide seamless journeys for people travelling in London. The internal design of public transport stations is beyond the scope of this document. However, the importance of the public realm surrounding interchanges must be realised.

Where the TLRN is considered to be part of the interchange to facilitate seamless journeys, exceptions to the palette may be appropriate.

Town centre high streets

Town centre high streets represent a focus for the communities that use the services they offer. The image of such locations is often determined by the quality of their immediate streetscape environment over which the TLRN has a strong influence.

Design teams may consider exceptions to the palette to be appropriate in order to reinforce local character.

It is not acceptable, however, to promote contrasting design approaches simply to signify a change in management responsibilities.

Special security measures

Sections of the TLRN, particularly in central London, may warrant special treatment where key national infrastructure or assets require special security measures. These measures may include the provision of security barriers.

It is not intended to include the special security measures in this edition of the Streetscape Guidance, as each site is likely to require different measures. The design team should recommend solutions take account of the security requirements and meet the aims of Streetscape Guidance.

Crash-resistant physical measures to impede vehicle-borne threats may be required.

Government security advisers (National Security Advice Centre) can provide further information. They can be contacted through TfL's Transport Community Safety Managers within the Community Safety, Enforcement and Policing directorate.

Heritage areas and features

Sections of the TLRN may also be within or adjacent to heritage areas. These range from World Heritage Sites and designated conservation areas to non-statutory heritage areas of local importance. They may also include the setting of listed buildings and scheduled ancient monuments.

It is the design team's responsibility to consult the relevant authority to establish the exact location and particular requirements of heritage sites and features. The local authority's conservation officer should be consulted in all cases.

The palette of materials will be applicable in most cases but it is recognised that these areas may also warrant special area status and special treatment.

Nature conservation sites

Sections of the TLRN may also be within or adjacent to areas with statutory and local designation for their nature conservation or amenity value. In some cases this may justify special area status and special treatment.

Open common and parkland

The TLRN also passes open common and parkland areas where the landscape is predominantly open common or parkland in character. They range from open areas of grass fringed by mature trees to dense areas of heath and woodland used for recreation. Typically, there are larger numbers of pedestrians and cyclists using these areas for recreational purposes. In some cases, it may be appropriate to consider special treatment, for example, resin bound surfaces.

Examples include:

- Putney Heath and Wimbledon Common (A3)
- Old Deer Park (A316)
- Kew Green (A205)
- Mitcham Common (A232)
- Hyde Park (A4202)
- Regents Park (A501)
- Blackheath and Greenwich Park (A2)
- Clapham Common (A205/A3/A24)
- Victoria Park (A12)
- Ealing Common (A406)

Design teams must take account of expert ecological, arboricultural and landscape management advice.

Mapping of designated sites

TfL has mapped most areas of biodiversity interest on or adjacent to the TLRN.

Urban civic, retail and commercial 1

Introduction

The TRLN passes through areas which are dominated by substantial government and commercial office buildings of both traditional and contemporary style.

Public buildings such as universities, libraries, museums and main line stations are located adjacent to the TLRN.

These streets experience high volumes of pedestrians around transport interchanges, tourist attractions, municipal buildings and institutions. These volumes peak at rush hour and lunchtime when there is a high level of pedestrian demand to cross the TLRN.

Where broad footways exist, the street environment should be enhanced, not only to cater for pedestrian movement but also to create places that people can use for relaxation and enjoyment.

There may be opportunities to create, in partnership with London local authorities and adjacent landowners, a series of civic spaces using public and private space adjacent to the TLRN.

1 Traditional paving extended to kerb

2 Traditional kerbs retained

3 Inspection cover replaced with insert cover

4 Concrete bollards replaced

5 Signal head on lighting column

6 Footway lighting added

7 Luminaire appropriate for urban centre location

8 Traffic bollards replaced by ‘hoop’ design

9 ‘Heritage’ lighting retained

10 All street furniture finished in black (excluding central reserve barrier)

11 Bus lane surface pigmentation corrected to end at stop line

Urban civic, retail and commercial 2

Introduction

Sections of the TLRN form some of the capital's premier retail locations as well as some of its typical high streets.

Streets are enclosed by buildings of varying stature and style, from residential properties to purpose-built retail outlets.

These streets may be congested at peak times, with stationary delivery and private vehicles affecting the streets' transport function.

Footway widths are generally maximised to cater for the pedestrian volumes, although the quality and style of paving often varies dramatically between the TLRN and private forecourts.

Cycle tracks within the footway are usually avoided due to the potential conflict with pedestrians.

Pedestrians using these high street locations can be hindered by poorly designed and located street furniture. Access can also be hindered by paraphernalia associated with adjacent retail premises. Advertising boards (A-boards) can be a particular problem.

Planting is typically restricted to street trees, with substantial specimens developing where space allows. Maintenance-intensive raised planters occur in some high street locations.

1 Traditional paving and kerbs retained

2 Inspection covers replaced with inset covers

3 Litter bin and control cabinet moved to rear of footway

4 Surfaces of tree pit enlarged to benefit street trees

5 Pedestrian guardrail removed from pedestrian refuge island

6 Street lighting improved and attached to buildings where practicable

7 All street furniture finished in black

8 Street clutter removed

Urban residential

Introduction

Sections of the TLRN pass through residential areas where privately owned properties face directly onto the street.

The streets may be enclosed by buildings of significant stature, both historic and contemporary in style. Cycle lanes are usually restricted to the carriageway.

There is a demand for on-street parking and deliveries, which can lead to a reduction in clear footway space. Overrunning of footways by vehicles (especially heavy goods and service vehicles) can result in extensive damage to paving.

Planting is typically restricted to street trees where space allows. Signage tends to be greater due to the requirement to enforce parking restrictions and other street furniture may be required to physically control parking.

1 Traditional paving and kerbs retained

2 Inspection covers replaced with inset covers

3 ‘Heritage’ bollards retained

4 Side road entry treatment improved and cycle facilities introduced

5 Cycle parking improved

6 High maintenance planters removed to increase footway space

7 Signs changed to improve cycle facilities and sign moved to rear of no entry sign

8 All street furniture finished in black

9 Inconsistent road markings removed

10 Streetlighting fixed to buildings where practicable

Suburban commercial and residential

Introduction

The land use beside the TLRN is predominantly commercial and industrial in these areas which are generally within suburban London. The buildings are often set back from the main carriageway, at the back of wide highway verges.

Frontage crossings to the TLRN are limited, with access most often gained along service roads. Vehicle speed limits are typically between 40 and 50mph, with junctions that are either signalised at-grade or grade-separated.

Footways and cycle tracks are often separated from the main carriageway by a grass verge. Pedestrian crossings are often restricted to footbridges and subways. Surface crossings are generally at signalised crossings.

1 Footway paving replaced with traditional materials

2 Bus stop road marking (line) corrected

3 Traffic bollard corrected

4 All street furniture finished in grey

5 New street trees

6 Inconsistent road markings removed

Suburban residential

Introduction

Many of the areas of London through which the TLRN passes are suburban and residential in character. They are frequently dominated by pre- and post-War, semi-detached, two storey housing. The housing may be set back from the main carriageway on parallel service roads.

Vehicle speed limits are typically between 40 and 50 mph with restricted access to the TLRN.

Footway cross-overs are frequent where there are no service roads.

Footways and cycle tracks, if present, run alongside the main carriageway, often separated by a grass verge.

Pedestrian crossings are usually footbridges, subways and at-grade crossings at signalised junctions.

1 Improved street lighting (columns and luminaires)

2 Pedestrian guardrails improved and unnecessary guardrails removed

3 Inconsistent footway materials replaced with asphalt

4 All street furniture finished in grey

Suburban rural fringe

Introduction

The TLRN passes through areas where the landscape is largely rural in character, with a predominance of open space edged by individual trees, hedges and blocks of woodland.

Built development is generally set back from the roads and may not be visible from the corridor itself. Vehicle speed limits are typically between 50 and 70 mph with access to the road restricted to grade separated junctions.

Typically, there are no frontage cross-overs and parking and loading is restricted to lay-bys.

Footways and cycle tracks, if present, are generally separated from the main carriageway by grass verges.

Grassed and planted verges can be extensive and are often important for biodiversity.

1 Redundant post removed

2 All street furniture finished in grey

3 Kerb detail improved

4 New street trees

7 Technical guidance: Footways and carriageways

7 Technical guidance: footway surfaces

Introduction

It is the aim of TfL to provide high quality footways on the TLRN to promote walking as a sustainable method of transport.

The correct implementation and supervision of footway works by adequately skilled personnel is essential.

Good paving design forms an important element of any public highway. Good footway design with suitable materials can successfully enhance an area's visual appearance.

New footway paving should be in keeping with the streetscape character area and take into account local distinctiveness in special areas. Good quality paving design and materials and an uncluttered street furniture layout aids legibility and enhances pedestrians' perceptions of the built environment.

Footway construction must be able to cope with the loads, forces and foreseeable uses acting upon it. A properly constructed footway, with a foundation appropriate for its use, will be more durable over time and avoid failures leading to uneven paving and trip hazards for users.

Design criteria

The range of materials can be grouped into the following two categories:

Paving units

Paving units are defined as either precast concrete flags or natural stone flags.

Precast concrete flags are the most common paving type on the TLRN.

Concrete flags emulate but cannot match the weathered natural look of natural stone paving and are not as durable over time.

900mm x 600mm concrete flags are preferred for the TLRN, especially for extensive areas of new paving.

Concrete flags should be laid with a regular transverse bond across the footway at 90 degrees to the kerb. The minimum bond stagger should be 150mm.

Chamfered edge concrete flags should not be used. Small unit paving, such as 300 x 300mm units and 200 x 100mm units, should not be used.

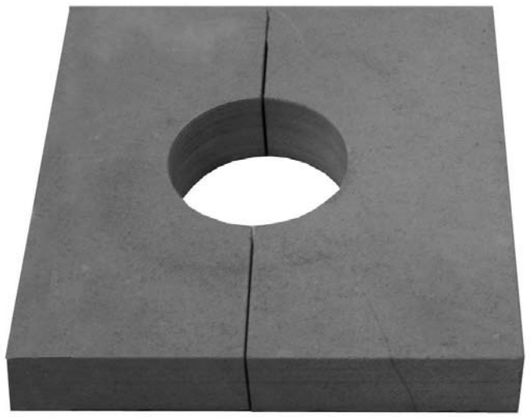
For special areas, natural stone slabs may be appropriate. Natural Yorkstone and granite are more expensive in the short term but, when designed with an appropriate construction for their use, are generally more durable in the long term. They are usually supplied with a distinctive striation or finish and range of textures and are available from a variety of sources.

Asphalt paving

Asphalt is the most commonly used term for bituminous mixtures. Asphalt is usually applied on a Type 1 granular material sub-base, typically over expansive areas of footway on streets with grassed verges in suburban or suburban-rural fringe areas.

Mastic asphalt is used extensively in central London locations. It gives excellent durability and inherent strength as well as excellent waterproofing qualities. It is typically used in thicknesses of up to 25mm and laid on a concrete base. Mastic asphalt is expensive but can be an ideal material to use where structures such as basements, cellars or bridges exist under the footway.

These paving types should not be regarded as inferior. When designed and executed well, in conjunction with high quality kerbs and other elements, these materials can produce fine results.



Core drilled flag

Good practice

Footways must be wide enough to accommodate peak flows of pedestrians and allow for the presence of bus queues etc.

Surfaces should be smooth and non-slip and the gradient should allow for the drainage of surface water and be comfortable to walk upon.

Where vehicles are known to illegally mount footways to park or load, high kerbs should be used to prevent this behaviour. Design teams should take into account the difficulties that this may cause less mobile pedestrians and make suitable provision of dropped kerbs to assist pedestrians cross the carriageway where necessary.

Design teams should take into account barriers on the footway, ramps and steps, basements, cellars, street furniture and other potential obstructions.

Footway surfaces must provide a firm, even, slip resistant surface in both wet and dry conditions and avoid surface reflection of materials, which may affect pedestrians with visual impairments.

Design teams should consider the layout of paving to anticipate and minimise the amount of cuts that will be required.

Particular care is required when dealing with changes in level. Design teams may need to show fold lines in surfaces on drawings. Generally the number of cut lines on footway surfaces is to be kept to a minimum and a single straight cut line used as opposed to several cuts. Cuts less than 150mm should be avoided wherever possible and slabs of constant width and various lengths used.

Mortar infills must be avoided at the backs of kerbs, at building faces and around utility covers, to achieve a high quality footway.

Mortar infills should also be kept to an absolute minimum around posts. The use of special paving (core drilled flags) is recommended.

Close butt joints should be provided wherever possible, for paving units to provide a high quality continuous surface, without a visible network of mortar joints.

The form of the bond must be considered where footways constructed with paving units turn corners, normally at junctions.

Careful cutting of paving units will be required to achieve a neat joint at the kerb edge and back of footway.

Square edged footway materials should be used wherever possible to ensure visual continuity.

Design teams may require a sample panel to be constructed for all footway paving materials to establish specified standards of workmanship for the scheme. The sample panel then becomes a benchmark which demonstrates the quality required. A typical trial area would cover about 30 square metres of footway and should include a kerb edge, a building line, several inspection covers, a radius and at least one dropped kerb.

Maintenance covers, gratings and tactile paving are an essential component of footways and as such have to be considered at the initial design stage. TfL advocates the use of inset covers help hide covers but these are expensive and utility companies will not maintain them.

When designing a section of footway that has private forecourts, cellars or basement lights particular care should be taken to ensure that the paving material chosen can join with these private areas without giving a patchwork effect.

In some instances it may be advantageous to gain the consent of the owner to re-aligning or renewing small areas of private forecourt to improve the overall design of the footway. In such cases it is usual to define it by fixing metal studs into the surface along the line of the property boundary, if the forecourt area is to remain private.

With reference to the use of new products on the TLRN, TfL has an internal procedure. Approval from the Streetscape Review Group should be obtained before the product is used.

References

Commission for Architecture and the Built Environment (CABE):

- Paving the way. How we achieve clean, safe and attractive streets, 2002

English Heritage:

- Streets for All, 2005

Transport for London:

- Making London a Walkable City. The Walking Plan for London, 2004

Streetscape Guidance:

- Palette of materials, Footways

Streetscape Guidance details:

- TfL/SG01, SG04, SG05, SG06, SG07, SG08, SG09, SG10, SG11, SG12, SG13, SG14, SG15, SG16, SG17, SG18, SG21, SG24, SG25, SG26, SG28 and SG29

Shared surfaces

Introduction

Shared surfaces are streets where traffic, pedestrians and cyclists mix, providing a dramatically changed public realm by removing the separation between the footway and carriageway. They have become a topical urban design issue, highlighted by examples such as Drachten in the Netherlands. These schemes also remove most of the standard signs and street furniture, giving designers much more flexibility and opportunity to create new forms of public realm.

There are many benefits produced by shared surfaces but there are also concerns for certain groups which need to be addressed to ensure fully inclusive design. The key groups which may be disadvantaged are people who are blind or partially sighted, who require the traditional delineators, such as kerbs, to guide them safely along a street. A report by the Guide Dogs for the Blind Association concludes that the confidence and independence of blind and partially sighted people are undermined by shared surfaces, with parts of some towns having become no-go areas. There are other people, such as those with no or limited hearing, children and elderly people, for example, who may become confused without a conventional street layout to follow.

Design criteria

Guidance on shared surfaces is being developed by TfL. Until this is published, any proposals to use shared surfaces on the TLRN will need to be approved by the Streetscape Review Group.

Good practice

TfL has set up a research group, entitled the Shared Surface and BVI165 Guidance and Research Group to identify, discuss and develop good practice to shared surface schemes.

The Shared Surface and BVI165 Guidance and Research Group includes members of the Greater London Authority group who have a particular interest in shared surface schemes and BVI165. The group will develop suitable actions and, where appropriate, shape good working practice.

References

University College London Pedestrian Accessibility and Movement Environment Laboratory (PAMELA):

- Testing proposed delineators to demarcate pedestrian paths in a shared space environment – Report of design trials conducted at University College London Pedestrian Accessibility and Movement Environment Laboratory (PAMELA), 2007

Guide Dogs for the Blind Association:

- Shared Surface Street Design Research Project, The Issues: Report of Focus Groups, 2006

Tactile paving

Introduction

With increasing focus on the role of public space, social interaction by all members of the public has become an important issue. The special information needs of those members of society who are blind or partially sighted must be given particular consideration.

Tactile paving is available in a number of different textured and coloured surfaces depending on its intended application.

The most common use on the TLRN is the blister paving used to indicate to pedestrians with visual impairments that they are passing from a footway to a carriageway.

Blister surface should be installed at both controlled and uncontrolled crossing points where the footway has been dropped flush with the carriageway or the carriageway has been raised to the level of the footway.

Corduroy hazard warning surface should be used for any situation where visually impaired people need to be warned of a specific hazard (top and bottom of steps, foot of a ramp, when a footway or footpath joins a shared area, etc). This surface should not be used to warn of obstacles, such as cycle stands.

Lozenge warning surface should be used at the edge of an on-street light rapid transit platform.

Ladder and tramline warning surfaces should be used on segregated shared footway and cycle tracks to indicate to visually impaired pedestrians on which side they should walk. The Ladder pattern, with raised bars across the direction of travel, is used on the footway side; the Tramline pattern, with raised bars in the same direction as travel, is used on the cycle track. The DfT's publication Inclusive Mobility and DETR's Guidance on the use of tactile paving surfaces are important reference documents.

Design criteria

Where a crossing point is in the direct line of travel (eg, at a junction), the tactile surface should extend for the full width of the dropped kerb and for a depth of at least 1200mm.

Where a crossing point is not in the direct line of travel, a depth of at least 800mm should be provided.

At controlled crossings only, a stem of blister paving, 1200mm wide, should extend from the main area of tactile paving to the back of the footway to indicate to visually impaired pedestrians the existence of the crossing facility.

The colour of the tactile paving needs to contrast with surrounding paving to assist partially sighted people to distinguish the presence of the crossing point. Red tactile paving must be used at all controlled crossings and charcoal grey at uncontrolled crossings on the TLRN.

The requirement for red tactile paving may be relaxed in conservation areas, subject to expert advice. The decision should be documented.

Tactile paving is available for the following applications:

- Pedestrian crossings:
  Parallel rows of flat-topped blisters that are 5mm high, 25mm in diameter and have a pitch of 64-67mm
- Hazard warning surface:
  Corduroy consisting in rounded bars 6mm high, 20mm wide and spaced 50mm apart
- Segregated shared cycle track and footway surface ladder and tramline pattern of flat-topped bars 5mm high, 30mm wide, and 70mm apart
- On street platform edge:
  Rows of lozenge shape 6mm high with rounded edges 150-83mm in plan

The following are to be used only in exceptional circumstances on the TLRN and subject to expert advice:

- Guidance path surface:
  Series of flat-topped bars (pedestrian travel direction) – 5.5mm high – 35mm wide and 45mm apart
- Information surface:
  No raised profile but detectable underfoot (softer) – matt finish and slip resistant

Good practice

The most important streetscape aspect of the use of tactile paving (other than compliance with the technical guidance on its shape and use) is the neatness of finish and care in its laying.

The presence of inspection covers and the changes in gradient associated with dropped crossings can make this difficult to achieve. The use of inset covers and the careful design of fold and cut lines in the footway surfacing material will be frequently required and the application of streetscape guidance details will need to be adapted at many locations.

Borders should not be provided around areas of tactile paving.

The careful design of the gradient of dropped kerbs and the use of quadrant kerb returns can simplify the design and produce a neat finish. They can, however, only be used when the design of any dropped kerbs and the vertical alignment (and height of kerb face) of the footway are well integrated so as to avoid trips.

References

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Department of Environment, Transport and the Regions:

- Guidance on the use of Tactile Paving Surfaces, 1998

Institute of Highways and Transportation:

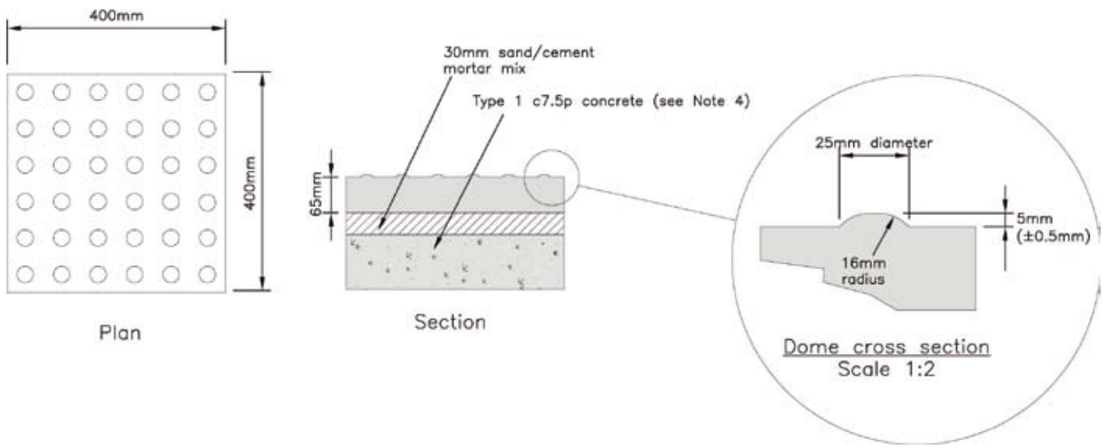
- Guidelines for Reducing Mobility Handicaps – Towards a Barrier-Free Environment, 1991

Streetscape Guidance:

- Palette of materials: Tactile paving

Streetscape Guidance details:

- TfL/SG01, SG02, SG03, SG04, SG05, SG06, SG07, SG08, SG09, SG10, SG11, SG12, SG17, SG18, SG22, SG25, SG26, SG27 and SG28



Inspection covers

Introduction

Inspection covers, chambers and stop taps etc. are located in the carriageway. Collectively, they are often referred to as ironwork. Utility companies own the majority of ironwork that appears on the public highway.

A small proportion is owned by the highway authority and these relate to traffic signalling, drainage and CCTV surveillance equipment.

The utility company mainly predetermines the size and location of their ironwork to suit their own purposes. A highway authority can arrange to have a utility relocate its underground services, the costs of which may be high.

TfL supports the use of deep frames for utility access to achieve greater consistency of footway surface materials.

Good practice

The use of inset covers helps to hide the presence of inspection covers. The cost of these covers and their future maintenance will need to be borne by the highway authority. Inset covers will therefore only be justified to allow for tactile paving or in areas of natural stone paving where there is a particular case for consistency.

Attention given to the detailing around covers can have a considerable effect on the safety and appearance of the footway and needs to be carefully described on construction drawings and details.

The designer should ensure that the footway surface abuts the edge of the cover frame to avoid the need for unsightly cement infill. Where the structure of the frame is such that this cannot be achieved with rigid surfacing materials, the below ground masonry should be lowered and replaced with a deep frame to give increased depth. This allows close laying of the footway material, and the retention of the shallow infill cover.

There is usually a small element of flexibility to alter the orientation of ironwork within footways. Design teams should therefore seek to align the orientation of the edges of a cover with that of the bond employed on rigid footway surfaces.

Utilities have a right of access to their plant. Care is therefore needed to ensure that access to chambers is not impeded by the location of street furniture.

In high security areas, inspection covers may need to be marked. Advice should be sought from TfL's Transport Community Safety Managers within the Community Safety, Enforcement and Policing directorate.

Special care is needed in the detailing of rigid footway surfaces that contain inspection covers where changes in the level occur, particularly where dropped kerbs are required. Ironwork cannot be made to fall in two directions (unlike flexible surfaces) and therefore careful consideration must be given to where rigid surfaces are folded.

This may require changes in level to be made more gradually than normal or a new cut line introduced into the surface (See Footway Surfaces section for good practice in relation to cut lines).

When introducing new inspection covers onto the footway (eg, for traffic signal duct work) the design team must ensure that an appropriate cover is used and it is situated within the footway in an inconspicuous manner. This can be achieved by detailing the cover to be positioned to fall in a natural break in the bond of paving.

Responsibility

Installation and maintenance of inspection covers, etc, is the responsibility of the service owner. However, if a highway authority replaces the cover with an inset cover, the highway authority will assume the maintenance responsibility for the cover from that day forward.

References

Legislation:

- New Roads and Streetworks Act 1991

British Standards:

- BS 7903: Guide to selection and use of gully tops and manhole covers for installation within the highway
- BS EN 124: Gully tops and manhole tops for vehicular and pedestrian areas

Streetscape Guidance details:

- TfL/SG12, SG21 and SG22

Kerbs and drainage

Introduction

Kerbs are a significant visual element in the streetscape. Traditional granite kerbs, which are TfL's 'standard', generally have a longer lifespan than other streetscape materials and therefore justify careful attention at design stage.

A kerb face (or upstand) of between 125mm and 140mm normally delineates the boundary of a carriageway. This provides a visible boundary for vehicular traffic and pedestrians and also channels surface water run off.

A smooth channel is provided adjacent to the kerb in the carriageway to assist cleansing. The channel is formed using either the same material as the carriageway surface, or occasionally from the same material as the kerb.

Effective surface water removal is essential for road safety and the comfort of all road users.

Drainage of the carriageway is usually achieved by the installation of gullies along the channel. Footway gullies are sometimes provided when a cross-fall across the footway into the channel cannot be achieved. To avoid ponding, the vertical alignment of the footway and carriageway surfaces must be designed so that surface water flows to the gullies.

Kerbs

Kerbs should typically have an upstand of 125mm. Higher kerb upstands can be used but careful consideration must be given to how people with mobility impairments gain access to the carriageway. Kerb upstands at bus stops should preferably be 140mm.

Gullies should be avoided along the length of dropped kerbs provided at pedestrian crossings (see also – at grade pedestrian crossings). Ideally, a gully should be installed immediately upstream of a pedestrian crossing to intercept runoff prior to the crossing.

Dropped kerbs should provide a gentle slope to minimise uneven footway surfaces. Internal and external radiussed kerbs should be used for all changes in kerb direction up to a radius of 12m to achieve smooth lines.

Kerbs should be radiussed, not mitred, and should form smooth and flowing lines.

Where granite kerbs are proposed at controlled or uncontrolled crossings, these should be light grey in colour.

Special shaped kerbs should be designed and ordered where a more robust kerb appearance will add significantly to the quality of the project. They are appropriate where extra protection is needed, eg, at islands and side road entries which may be narrow but need to cater for heavy traffic flows. The use of 'standard quadrants' should be avoided.

Shaped kerbs may be considered as 'standard specials' for elements where extra protection is needed, eg, at islands, and small but busy (in relative terms) side road entries.

Safety or other types of kerbs may be used to prevent vehicles leaving the carriageway or at bus stops. These should be used as recommended by TfL safety and bus priority specialists.

Kerbs should be dry jointed and closely butted where possible. Rear faces should be sawn to avoid the need for mortar infill between paving and kerb. Widths of kerb should be generally 150mm except where 300mm widths are to be matched or re-used.

TfL trials have shown that granite kerbs can be successfully redressed and relaid.

Drainage

A conventional highway is constructed to have a camber or cross-fall on the carriageway and a cross-fall across the footway to the channel. Precast concrete trapped gully pots, installed along the channel, are connected to 150mm diameter pipe connections that discharge either directly to the nearest appropriate sewer or via a highway drainage pipe system. Gully pots should be positioned to drain a highway catchment area of approximately 200m.

Where the highway has a steep longitudinal fall, a storm gully cover and frame may be used in preference to a standard cover in order to reduce the tendency of the run-off to overshoot the gully. These covers are 'handed' and must be installed correctly in relation to the direction of flow of the run off.

Where there is little longitudinal fall, false summits should be introduced along the channel to encourage water to flow into the gullies.

On some highway structures, it is not always possible to use conventional gully pots due to insufficient construction depth. Alternative drainage systems should be designed into the structure in these circumstances.

One alternative is to use combined kerb drainage blocks where water flows at minimum depth, within a perforated kerb unit. There is an expectation that these are easily blocked and require a higher level of maintenance but they have proved very effective on the A13.

Special attention should be given to providing adequate drainage where there are traffic calming features such as side road entry treatments and where the footway is being extended into the carriageway. These types of feature often change the vertical alignment of the carriageway and trap water, creating ponding.

Footways should drain into the channel, where run off finds its way into the carriageway drainage system. Where this cannot be achieved, such as in large areas of footway or where a back fall on the footway cannot be avoided, it may be necessary to provide some form of drainage within the footway. This may take one of three forms:

- Conventional footway gullies or smaller 'yard gullies'.
- Shallow open channels which can either connect to a footway gully or extend along the footway and turn run off water into the carriageway channel using changes of level afforded by the long fall of the highway.
- A 'U' shaped channel covered with a perforated metal grid.

Good practice

The use of footway drainage systems should be avoided wherever possible.

The gratings on footway and yard gullies provide only small perforations that block easily. Similar problems occur with 'U' shaped channels with the metal covers blocking. These systems also present cleansing problems and may be a trap for heels.

If the footway cannot be drained into the channel by means of a simple crossfall across the footway, design teams should design the footway surface to form an open channel. Rain water collecting in this channel should then be directed into the carriageway by using the highway longfall and turning the formed channel into the carriageway edge where the footway crossfall allows.

If an open channel is used on the footway, the channel may be created by forming the footway surface into a straight shallow 'V'.

Carriageway drainage should be designed so that both the footway and carriageway will continue to drain satisfactorily if one or more gullies become blocked with litter. This is particularly important in areas adjacent to pedestrian crossings.

References

Department for Transport, Highways Agency:

- Manual of Contract Documents for Highway Works: Volume 3: Highway Construction Details

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

British Standards:

- BS EN 124: Gully tops and manhole tops for vehicular and pedestrian areas

Transport for London:

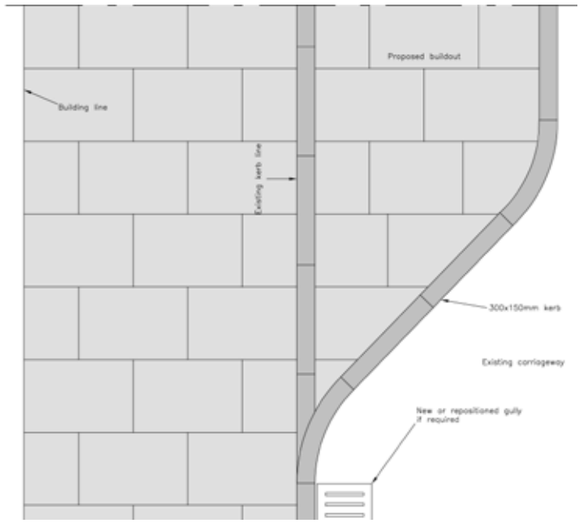
- BP1/06: Bus Priority Team technical advice note: Accessible bus stop design guidance, 2006

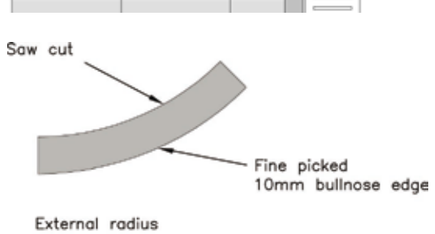
Streetscape Guidance:

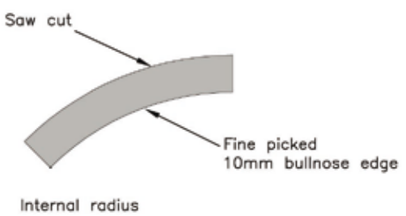
- Palette of materials: Kerbs

Streetscape Guidance details:

- TfL/SG01, SG02, SG03, SG04, SG05, SG06, SG07, SG08, SG09, SG10, SG11, SG12, SG13, SG14, SG15, SG16, SG17, SG18, SG19, SG20, SG23, SG24, SG25, SG26, SG27, SG28 and SG29







Footway crossovers

Introduction

Footway crossovers offer a means of allowing vehicles to cross the footway to gain access to or egress from private land whilst maintaining priority for pedestrians.

The footway continues unbroken across the mouth of the access. Drivers of vehicles who wish to use the crossover should give way to pedestrian movements along the footway.

To create a footway crossover, a length of kerb is lowered to carriageway level and the surrounding footway adjusted to provide a ramped surface to the carriageway. The area of footway between the access into the private land and the dropped kerb is strengthened to withstand any loading that it may be subjected to from those vehicles using the crossovers.

Footway crossovers generally take one of two forms often referred to as 'light' or 'heavy'crossovers. It is essential that the usage is determined prior to construction.

- Light crossovers are used to provide access to a private house or similar application where access is likely to restricted to cars or light vehicles.
- Heavy crossovers are used where access is required for heavier vehicles such as delivery or goods vehicles.

New footway crossovers may be created when the owner of land adjacent to the public highway makes a request to the planning and highway authority for the construction of a crossover. If the highway and planning authority agree, the works are usually undertaken at the expense of the landowner. This will include the cost of strengthening the footway, moving street furniture and, if necessary, lowering subsurface utility plant.

Design criteria

The construction of the crossover should accommodate the magnitude of loading it will be subjected to when vehicles cross the footway. The width of the crossover should accommodate the path of vehicles using it without mounting the adjacent footway.

The design of the crossover should be such that surface run-off from the carriageway will not enter private land or cause ponding.

Tactile Paving in the footway either side of the crossover is not usually required.

Footway crossovers should not be located within bus stop cages.

Good practice

Crossovers should maintain the vertical alignment of the footway except for a short ramp down to the carriageway. Dropped kerbs are generally used to form the mouth of the crossover, which is normally between 2.4 and 3.0m wide. A 25mm upstand should be maintained between the carriageway and the crossover.

The surfacing materials on the crossover should match that of the surrounding footway.

The gradient of the ramp to the dropped kerb should not exceed 1 in 12. Where the footway is narrow, the ramp should not extend across the full width of the footway. In these circumstances the gradient of the dropper kerbs should be reduced and the footway adjacent to the crossover partially lowered such that a 1 in12 ramp down to the carriageway can be achieved leaving a level area of footway across the crossover. This provides a more comfortable surface for wheelchair users and an area of footway that is easier to use by pedestrians in icy conditions.

The sight lines of motorists using the crossover to join the carriageway must be kept clear so that they can see pedestrians using the footway and give way to them. Access gates on the boundary to the private land must not open on to the public highway as they would create physical obstacles and sight line problems.

Utility companies' plant running under the footway is frequently laid at shallow depths. All utility service providers should be consulted and allowed the opportunity to protect their plant before any construction work is considered.

References

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Side road entry treatments

Introduction

An entry treatment may be described as a traffic calming device which is normally placed across a minor road junction with a major road, either at the entrance to the junction or within a short distance of it. Entry treatments are generally used to denote the change in the character between a main traffic route and a road of a lower order, such as a residential street or access road.

Entry treatment seeks to achieve a combination of objectives, in particular, providing for easier pedestrian movement by raising carriageway level up to footway level, slowing vehicle speeds by reducing corner radii and deterring parking close to junctions by narrowing the carriageway.

Entry treatments aim to create a strong visual threshold for traffic leaving or entering the minor road, and to indicate to motorists the need to change their driving behaviour to accord with the different traffic conditions they are about to encounter.

Their use has been shown to reduce the numbers of accidents to vulnerable road users.

Design criteria

Raised entry treatments should be considered as an uncontrolled crossing and have tactile paving designed accordingly. The width of the raised crossing area should be at least 2.4m and the raised crossing area should be flush with the footway. If items of street furniture are to be incorporated into the entry treatment, they should be provided in accordance with the general design principles for street furniture. In many cases, additional drainage arrangements will be required.

Vertical deflection

It is common practice to use a flat-topped road hump to create the raised area. Such raised areas will invariably cause the vertical deflection to exceed the 75mm height that is more normal for road humps. Therefore particular consideration must be given to ensuring that the ramp gradients and length of raised area are sufficient to avoid grounding of vehicles. Vertical deflections must not prevent reasonable access by emergency services. Bus access and HGV delivery also need to be considered.

Materials

Asphalt should be used. Concrete or granite kerbs, matching the footway kerbs, may be used to make a clearly defined and neat junction between walking surface and ramps.

Carriageway narrowing

The extent to which the carriageway might be narrowed will depend on local circumstances including traffic flows, vehicle sizes, vehicle types (eg, emergency vehicles) and turning movements.

Where the side road forms a one-way street, carriageway widths should normally be sufficient only for single vehicle access or egress, typically in the range of 3.5-4.0m. If the side road has two-way flow a minimum width of 5.5m should be provided.

Care should be taken to reform kerblines and to relocate drainage gullies when the carriageways are narrowed.

Radius kerb alignments should be used, with the angle of kerb return no greater than 45 degrees.

Location

Entry treatments are normally only used in urban areas. Depending on the features they incorporate, they may be used alone or to indicate the start of a series of traffic calming measures.

They can be an effective means of identifying the beginning of 20mph zones.

Entry treatments should be located so that they do not interfere with vehicle access to frontage properties. They should not be used adjacent to roads where vehicle speeds are high, as vehicles turning onto the ramp and raised table will be moving at low speeds.

Good practice

Appropriate ‘give-way’ markings and signs must still be provided where traffic may emerge from a side road. These signs and markings must comply with Traffic Signs Regulations and General Directions. In order to control the speed of vehicles turning into side roads the kerb radii should be small (approximately 3m).

The side road entry area should be adequately illuminated in accordance with BS5489 and BS EN13201.

References

Legislation:

- Highways Act 1980
- Traffic Calming Act 1992

Statutory Instruments:

- Traffic Signs Regulations and General Directions 2002
- Highways (Road Hump) Regulations 1999

Department for Transport:

- Traffic Advisory Leaflet 02/94: Entry Treatments
- Traffic Advisory Leaflet 13/93: Gateways
- Traffic Advisory Leaflet 3/93: Traffic Calming Special Authorisations
- Traffic Advisory Leaflet 7/96: Highways (Road Hump)

Department for Environment Transport and the Regions:

- Guidance on the Use of Tactile Paving Surfaces, 1998

British Standards:

- BS 5489-1: Code of practice for the design of road lighting
- BS EN 13201: Road lighting

Streetscape Guidance:

- Palette of materials: Side road entry treatments

Streetscape Guidance details:

- TfL/SG06, SG07, SG08, SG09, SG10, SG11, SG12 and SG28

Road markings

Introduction

Road markings are the lines, patterns, words or other devices, applied or attached to the carriageway for controlling, warning, guiding and informing the road user.

They can also act as a psychological barrier, signify the delineation of traffic lanes and provide lateral clearance from traffic hazards for the safe movement of traffic.

Road markings are vital to ensure smooth and orderly flow of traffic and for promoting road safety.

Reflective road studs supplement linear road markings and can be particularly effective at night in enhancing the objectives of warning and guiding road users.

Design criteria

Road markings are normally made from a hot applied thermoplastic screed with glass beads applied to provide a retro-reflective surface. Durable paints are also used but typically do not provide the same retro-reflective quality that can be achieved with thermoplastic.

Skid resistance is an important consideration, particularly when markings are applied to larger areas of the carriageway. Metal road studs should be avoided as they can cause particular problems for two wheeled vehicles.

All markings and colours should be in accordance with the regulations, British Standards and TfL's specification.

The Traffic Signs Manual Chapter 5 allows minimum widths of lines. TfL considers 50mm to be appropriate for design speeds of 30mph which should be used where the design team considers that it is appropriate to do so, taking specialist advice as necessary. 100mm lines are to be used for roads of higher design speeds.

Design teams should, however, take account of enforcement requirements and the need for consistency.

Good practice

The extent of road marking is to be kept to the minimum necessary to:

- Ensure safety
- Achieve compliance with traffic regulations
- Provide sufficient information for lane discipline

Sprayed paint may be used instead of thermoplastic but is much less hard wearing and will require more frequent maintenance.

Thermoplastics should be avoided on concrete blocks and natural stone and will require more frequent replacement.

Specialist hard wearing pre-formed thermoplastic paints that adhere to concrete and stone are available but expert advice should be sought before specifying these products.

During routine maintenance when road markings are often re-marked it is important to ensure the new surface is accurately applied over the old material so that the edges of the markings remain crisp and of the desired width.

Poorly maintained road markings are much more unsightly than well-maintained markings and detract from the streetscape. The excessive build up of thermoplastic, which can lead to ponding of surface water, should also be avoided.

When road markings are removed, it is important that all the thermoplastic or road paint is removed. Ghost images of old markings are unsightly, detract from the streetscape and can have an impact upon road safety.

The bulk of road marking material should be removed by mechanical means, and there are environmentally-friendly sand blasting techniques now available that can remove road markings cleanly without damaging the road surface.

Hard wearing highly reflective preformed thermoplastic markings are available but expert advice should be sought before specifying these products. The use of preformed markings is preferred when forming more complex shapes and symbols, such as for cycle routes and speed limit roundels.

Yellow boxed areas can look unsightly and consideration should be given to using advisory 'KEEP CLEAR' white text markings where legal enforcement is not necessary.

References

Statutory Instruments:

- Traffic Signs, Regulations and General Directions 2002: Section 4 and Schedule 6 (Road markings)

Department for Transport:

- Traffic Signs Manual, Chapter 5: Road Markings

Bus lanes

Introduction

A bus lane is a traffic lane on the public highway which is reserved for buses and other specified modes of transport. Some bus lanes operate at designated times.

In some situations, heavy goods vehicles are also permitted to use bus lanes. TfL is also trialling the use of bus lanes by motorcyclists.

Taxis and cyclists are usually permitted to use bus lanes. If it is required to specifically exclude cyclists, special authorisation from DfT isrequired and alternative provision must be made for cyclists.

Bus lanes

Bus lanes are usually located at the kerbside, in order to serve bus stops. Their primary purpose is to give buses priority at the locations and times most needed whilst minimising disruption to general traffic.

TfL policy is to use venetian red coloured surfacing to bus lanes since this has been found to aid compliance with bus lane traffic regulations by making the bus lane more conspicuous. The preferred treatment for bus lanes is a pigmented thin surface course system, unless site conditions or location demand an alternative approach.

Bus lanes are only enforceable when the road markings and signing comply with the Traffic Signs Regulations and General Directions (TSRGD). Design teams will need to consider how the signing can be introduced without unnecessarily increasing street clutter by, for example, introducing more posts onto the footway.

The above may involve erecting the signs on lamp columns (see also the Traffic Signs and Street Lighting sections). Where this is being considered, it should be noted that the signs used at the start of the bus lane (and as repeaters following side road junctions) are too large to be erected on standard strength lamp columns (see also the Traffic Signs and Street Lighting sections). In these circumstances, it may be necessary to replace the lamp column with a higher strength column.

The selection for the location of the start and end points of a bus lane is critical to its success and safety. Lanes should start upstream of the predicted traffic conflict (queues) and be located to ensure that excluded traffic has a safe distance to merge into alternative lanes. When determining the precise position of these points, the coordination of the regulatory signing with other street furniture must be considered (see above).

Minor amendment of the bus lane design, moving the start and finish points by a few metres, may enable the use of existing street furniture to locate regulatory signing, thus minimising clutter.

The use of cycles in bus lanes

There should be a general presumption that cycles will be allowed to use bus lanes. Only where a contra-flow, or a with-flow offside bus lane is being planned, and there is a concern for the safety of cyclists, should their exclusion be considered. Even here though, a comparison should be made with the relative risks that they might face on the alternative route.

Design criteria

In determining the practicability and feasibility of implementing a bus lane within the existing built environment and infrastructure, consideration should be given to:

- The volume of potential bus users
- The carriageway width
- The overall capacity of the carriageway
- The proximity of street trees to the carriageway

If the above considerations satisfy and warrant the need for design, the following points must be implemented where possible:

- Signage – existing and proposed regulatory signage should be consistent along the route, clear, unobstructed and in accordance with TSRGD
- Road markings – need to be modified as appropriate in accordance with TSRGD
- Pigmentation – where coloured surfaces are appropriate, pigmentation should be Venetian red (BS381C – Colour 1434)

Good practice

Design teams must ensure existing controls and restrictions on stopping are enforceable to avoid obstruction of the bus lane by other vehicles.

The introduction of contra-flow bus lanes can initially confuse pedestrians who then look the wrong way when crossing the carriageway and advice should be sought from safety experts.

Good design practice should ensure that where possible signage is kept to a minimum and those signs are erected on existing posts.

Advice on the design and layout of bus lanes should be sought from the TfL Bus Priority Team.

References

Statutory Instruments:

- Traffic Signs, Regulations and General Directions 2002

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges

Department for Transport:

- Local Transport Note 1/97: Keeping Buses Moving
- Traffic Signs Manual, Chapter 3: Regulatory Signs
- Traffic Signs Manual, Chapter 5: Road Markings

Transport for London:

- Guidance on the use of Coloured Highway Surfaces on the TLRN, 2004

Cycle lanes and cycle tracks

Introduction

A variety of different types of cycle facility will need to be incorporated on the road network. These will include on-carriageway cycle lanes, and off-carriageway cycle tracks, adjacent and shared paths.

At junctions and crossing points special cycle crossings or Toucan (shared pedestrian and cycle crossings) may be required as part of the range of measures that are needed to cater for cyclists.

A summary of key points relating to the links (excluding junctions and crossings) is contained within the following section.

Cycle facilities should be installed with careful consideration of the needs of cyclists in context with other priorities. High quality cycling conditions encourage this environmentally-friendly mode of transport.

Wherever cycling takes place, the surface conditions must be suitable, this means that suitable maintenance procedures must be put in place.

Any designer of cycling facilities should refer to the London Cycle Design Standards (TfL 2005) which is available on the TfL website.

Cycle lanes (on-carriageway)

Cycle lanes are parts of the carriageway reserved for cyclists. They may be either mandatory or advisory. Mandatory cycle lanes are enforceable, excluding all other vehicles for all, or part, of the day.

Cycle lanes usually provide for travel in one direction only, and this will generally be the same direction as other vehicles. But contra-flow cycle lanes, against the flow of other vehicles, can be provided in certain circumstances.

Cycle lanes can also give the impression to drivers of other vehicles that this is where cyclists belong, resulting in danger for those cyclists who legitimately need to leave the lane. The visual impact of signs and road markings associated with cycle lanes should be considered.

Shared bus and cycle lanes are dealt with in the Bus lanes section.

A solid white line in reflective thermoplastic must be used to mark the boundary of a mandatory cycle lane. A broken line marks the boundary of an advisory cycle lane.

When designing a cycle lane, a width of 1.5m should normally be used. This ensures that cyclists can avoid riding over road gullies and along channel lines that may be uneven, wet or icy. If carriageway width allows, design teams should consider increasing the cycle lane width to 2.0m where cycle flows are high.

Gully gratings must never be parallel to the cyclists' direction of travel.

Cycle tracks (off-carriageway)

Cycle tracks are facilities dedicated for cyclists that are separated from the carriageway. Shared paths that can be used by pedestrians and cyclists can also be provided.

As a general principle, the presumption is that the footway along the TLRN should only be used by pedestrians.

In some circumstances, however, cyclists may be permitted to use the footway. This requires a change in the legal status of the footway to cycle track together with the appropriate signage and any necessary construction works. These circumstances include:

- Where the footway is wide enough to accommodate both pedestrian and cyclists with adequate segregation and without lowering the level of service provided to the pedestrian
- Where a cycle route crosses the TLRN and the crossing movement of cyclists cannot be safely accommodated in the carriageway
- Where the width of the carriageway is insufficient to safely accommodate general traffic and cyclists and the pedestrian flow along the footway is low

Where cycle tracks are provided the appropriate signing must be erected, but consideration must be given to minimising street clutter. The height of signing above the footway/cycle track must be checked to ensure adequate clearance for cyclists. Where cyclists pass under any signage a clearance height of 2.4m must be provided.

For cycle routes that pass under obstacles less than 23m in length, a minimum headroom of 2.4m should be provided. Obstacles greater than 23m in length require a minimum headroom of 2.7m.

For equestrian routes, a minimum headroom of 3.4m should be provided for horses with riders and 2.8m for horses being led.

Design criteria

A prime factor in determining whether to provide mandatory or advisory cycle lanes is the need for other vehicles to gain access to the kerbside for loading and parking purposes. Where double red lines exist and adequate carriageway width is available, mandatory cycle lanes are preferred.

Consideration must also be given to introducing advanced stop lines (ASLs) at traffic signals to improve cycling conditions at junctions.

When providing cycle lanes or cycle tracks within the streetscape other factors that must be considered at the design stage include:

- Route design – cycle lanes and tracks should be convenient to use, coherent, direct, attractive, safe and comfortable with good running surfaces. This requires special attention to: road geometry that does not present a hazard; skid resistance; continuity; good signing (where necessary); ironwork and maintenance

- Plants – the choice of trees and shrubs in planting areas must take into account future growth and future maintenance requirements. Cyclists may leave cycle lanes and tracks to avoid overhanging vegetation growth and travel into the path of pedestrians and vehicles.

  Design teams should seek advice from TfL's Route Managers – Arboriculture and Landscape, with regard to the maintenance regime. Plants with thorns should be avoided as pruning can result in cycle punctures.

- Street lighting columns – most segregated cycle tracks run close to the kerb edge where street lighting columns are usually placed throughout London. Design teams will need to seek advice on the positioning of street lighting columns at an early stage in the design process to ensure that adequate widths for both pedestrians and cyclists can be achieved, whilst maintaining lighting levels on the footway, cycle track and main carriageway, without columns causing a physical obstruction. In some circumstances, it may only be possible to achieve adequate width for pedestrians and cyclists by moving the lamp column

- Signage and road markings – candatory cycle lanes and cycle tracks are only enforceable when the appropriate road markings and signing comply with the TSRGD. Design teams will need to consider carefully how the signing can be introduced without increasing street clutter. This may involve erecting the signs on lamp columns. Where other signing already exists on suitably located columns, the additional signing may cause wind loading to exceed the tolerance of standard strength lamp columns

It may in these circumstances be necessary to replace the lamp column with one of higher strength, but with the same appearance or seek opportunities to relocate the existing signing to other existing posts or columns (see also the Traffic Signs and Street Lighting sections).

The consideration of how and where signs are to be erected for cyclists and cycle facilities must therefore be carefully considered at the design stage of both the introduction of cycle facilities and when changing street lighting.

- Road signs and markings must be placed correctly

- Dropped kerbs – where cycle tracks or shared paths are provided, flush kerbs must be incorporated at entry and exit points to assist cyclists on to and off the carriageway

- Coloured surfacing may be applied to cycle lanes to increase conspicuity of the facility for all road users. TfL policy is only to provide green surfacing to mandatory cycle lanes, to advisory cycle lanes across side road junctions, to advanced stop line areas and other areas of potential cycle conflict

However, the provision of highly conspicuous surfacing can detract from the aesthetics of the streetscape and may not be appropriate in special or conservation areas. Advice should be sought from TfL's Cycling Centre of Excellence.

Where coloured surfaces are appropriate, pigmentation should be deep chrome green (BS381C – Colour 267).

Good practice

The London Cycle Design Standards (LCDS) are the definitive guide to design for cycling in London.

The attractiveness of the route is important to existing cyclists and can also attract new users. Design teams should therefore consider the total experience of the cyclist on the journey. This means paying attention to the environmental quality of the route and engineering details.

Cycling facilities should enhance the area through which a route passes, not detract from it. Good quality urban design is therefore essential. Enforcement of stopping regulations, to avoid obstruction by other vehicles of special facilities such as cycle lanes and shared bus and cycle lanes, must be achieved if the benefits to cyclists are to be realised.

When designers use the cycle symbol to TSRGD diagram 1057 they should use preformed road markings. Hand-formed cycle symbols invariably have a poor appearance.

The slots in gully grates should be set so as not to align with bicycle wheels. All gully grates should be flush with the road surface.

The skid resistance of surface materials is very important to cyclists and design teams should ensure materials comply with appropriate standards.

References

Statutory Instruments:

- Traffic Signs, Regulations and General Directions 2002

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges, Volume 5, Section 2, Part 4 TA 91/05: Provision for Non-motorised Users
- Design Manual for Roads and Bridges: Volume 6 Section 3, Part 5 TA 90/05: The Geometric Design of Pedestrian Cycle and Equestrian Routes
- Design Manual for Roads and Bridges, Volume 6, Section 3, Part 1 TD 36/93: Subways for Pedestrian and Pedal Cyclists Layout and Dimensions

Department for Transport:

- Traffic Signs Manual, Chapter 5: Road Markings
- Local Transport Note 1/04 Policy Planning and Design for Walking and Cycling
- Local Transport Note 2/04 Adjacent and Shared Use by Pedestrians and Cyclists

Transport for London:

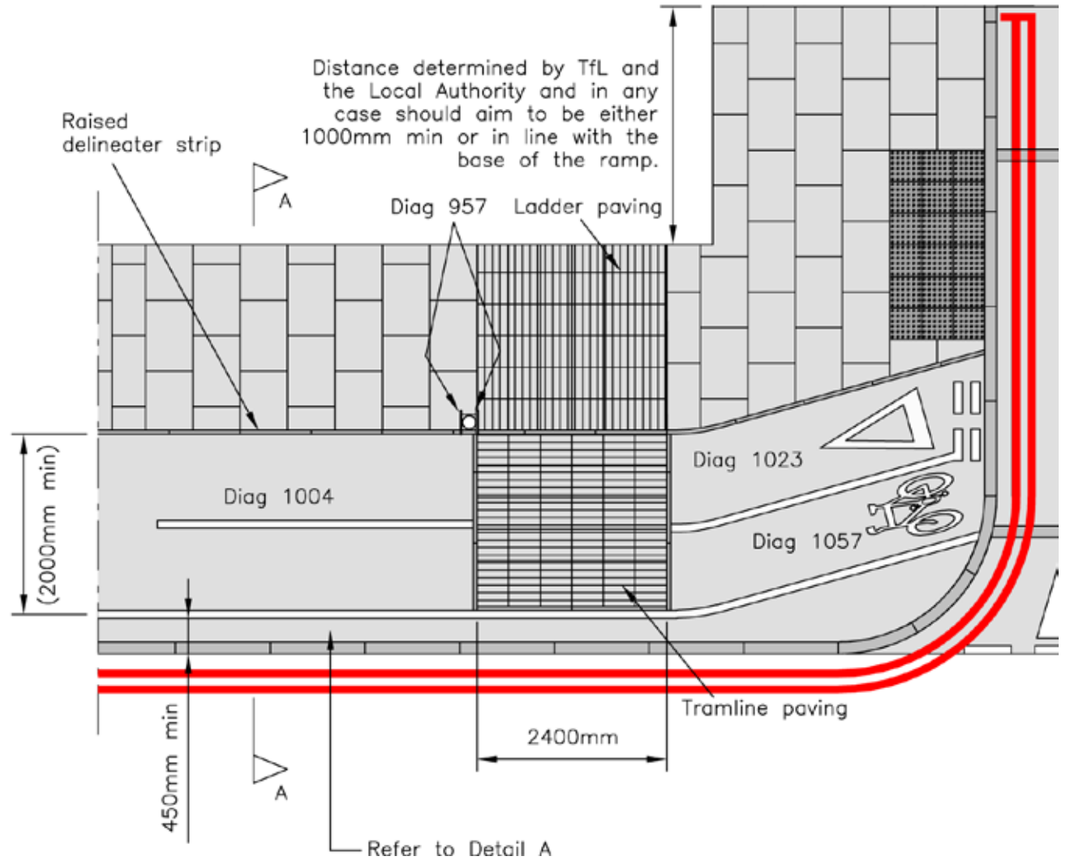
- London Cycling Design Standards, 2005
- Guidance on the use of Coloured Highway Surfaces on the TLRN, 2004
- London Cycling Action Plan, 2004

Streetscape Guidance:

- Palette of materials: Cycle tracks, Cycle lanes, Shared surfaces

Streetscape Guidance details:

- TfL/SG04, SG05, SG10 and SG11



Subways

Introduction

Subways are most common on high speed roads on the TLRN. From a road safety perspective, subway crossings are considered safer although they can cause difficulties for people with mobility impairments. They may also give rise to concerns about pedestrian personal security or simply present an unpleasant environment. As a result, some pedestrians will endeavour to cross heavily trafficked carriageways in an effort to avoid using them.

Closure of subways

When reviewing the streetscape of the TLRN, opportunities for introducing safe new at-grade pedestrian crossings as alternatives to subways should be explored.

Good practice

New subway crossings should be located where there is high demand to provide a pedestrian crossing and where a safe at-grade facility cannot be provided because of the speed of vehicles or without causing excessive congestion and delay to public transport. In these circumstances, they should be located as close as possible to where pedestrian desire lines cross the carriageway. To help pedestrians find and use the subway, appropriate information signing may be required directing them to the crossing.

Lighting of the subway, ramps, stairs and approaches should be designed in accordance with BS5489. Wall, floor and ceilings should be designed and finished to reflect light and to counter shadows. Vandal-resistant mirrors that enable pedestrians to see around corners will be necessary.

Surface water must be controlled to prevent ponding in the subway.

CCTV systems may be used to increase or promote a sense of personal security.

Vandal-resistant and sound deadening material to counter echo may be used to line subways.

Tiling based on art work designed by the local community can also help to reduce the incidence of vandalism.

References

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges, Volume 6, Section 3, Part 1, TD 36/93: Subways for Pedestrians and Pedal Cyclists Layout and Dimensions

British Standard:

- BS 5489-1 Code of practice for the design of road lighting

Parking and loading bays

Introduction

The use of parking or loading bays marked within the carriageway should be used to provide for servicing where no other alternative for servicing exists.

Parking or loading bays defined by means of an appropriate Traffic Regulation Order can be designed to operate for all or part of the day. They can be similarly controlled to restrict the maximum duration of stay within a box.

It is important that designers understand the differences between parking activities and loading activities.

A loading activity is generally where a driver causes their vehicle to stop on a highway for the purposes of delivering and collecting goods between a nearby property and a vehicle.

A parking activity is when a driver decides to stop their vehicle on a highway for any other purpose (and typically the driver leaves the vehicle). Parking or loading bays in which vehicles are permitted to stop for the entire period that adjacent single red line controls operate are marked with broken white lines.

Parking or loading bays in which vehicles are permitted to stop for a restricted part of the time that adjacent single red line controls operate are marked in broken red lines.

The nature of the activity, time of day and the duration for which an activity is permitted must be indicated on a sign erected adjacent to the box for the controls to be enforceable.

Parking bays can be specifically dedicated for use by a particular type of vehicle eg, buses, coaches or motorcycles.

Parking bays can be reserved for particular types of user eg, Blue Badge holders or doctors.

Design criteria

The allocation of kerb space to allow loading or, where appropriate, parking is important for the operation of business and commercial interests.

Stopping, parking and loading controls should be used to assist the free and safe flow of traffic, particularly buses. Parking or loading bays should be designed to ensure that their use (and turnover of use) is appropriate to the land use and streetscape.

Minimum widths for on-street bays for various vehicles and activity are:

- 1.8m for parking motorcycles, taxis and cars
- 2.4m for vehicles to load and unload
- 2.7m for bays reserved for Blue Badge holders

Minimum lengths for on-street parking bays for various vehicles are:

- 6.6m for bays for Blue Badge holders
- No restrictions for other vehicles

The nature of the land use adjacent to the carriageway will determine the type and duration of the parking and loading activity that may be required to take place in bays on the carriageway. The periods during the day when that activity may be permitted to take place is largely determined by the capacity of the highway and the potential of creating avoidable congestion.

Changes in usage may occur over time. Design and operation teams will need to react to changes.

Designers must consider how permitting a vehicle to stop on the carriageway will affect the sightlines and safety of people crossing, travelling along and stopping on the carriageway.

Designers must provide for accessibility to the footway especially when introducing loading or Blue Badge parking bays. The introduction of a dropped kerb within or next to the box must be considered, especially where the use of trolleys and other heavy and bulky goods is likely to occur.

Location criteria

Bays that permit people to stop vehicles should only be introduced where there is no viable alternative location to stop off the highway.

Only in exceptional circumstances should the introduction of inset bays be considered. Such circumstances usually involve a wide footway, a clear demand for loading or servicing, and a particular need to keep traffic lanes unobstructed.

The convenience of motorists is not a suitable reason for a parking box within the footway. Where designers feel that installing bays should be considered on the footway, TfL must be consulted and agreement sought.

When designers consider that a need exists to provide bays, they should be located in side roads adjacent to the TLRN, wherever possible. Agreement must be obtained from the highway and traffic authority for the length of side road affected.

The following is given as guidance:

- Loading bays – along or adjacent to streets with commercial and/or industrial premises or at places where cash, mail or other valuables are delivered or collected
- Parking bays – along streets with commercial, industrial, residential premises
- Disabled Bays – reserved for Blue Badge holders must be considered close to local amenities. Local groups representing people with mobility impairments should be consulted when designing stopping controls and their suggestions for suitable locations for 'disabled only' bays sought

Parking should not normally be permitted within bus or mandatory cycle lanes during the hours in which the lanes operate. Loading may be permitted in certain circumstances, but must be carefully enforced to ensure that the facility is not compromised.

Good practice

When there is a need to place bays on the carriageway, designers must consider the signing required for enforcement.

The location of the box and its signing should take account of and co-ordinate with other street furniture to avoid clutter (see also the Traffic Signs section).

The following must be considered:

- Parking and loading facilities should be located for the convenience and safety of all road users, not just motorists
- Bays must be visible to motorists and pedestrians through the use of appropriate markings
- Parking bays should not be introduced in the carriageway where there are suitable off-street opportunities for motorists to park

Parking and loading bays should be constructed using radiussed kerbs and their surfaces should be asphalt.

When designing the signing associated with bays, the smallest allowable text size 'X' height available should be used to keep the size of the sign to a minimum.

Designers should orientate the signs as required by the Traffic Signs Manual.

The colour of the backs of signs and any dedicated poles supporting them should be consistent with other street furniture, ie. black or grey in accordance with the palette.

References

Statutory Instruments:

- Traffic Signs, Regulations and General Directions 2002: Section 4 and Schedule 6 (Road Markings)

Department for Transport:

- Delivering the Goods: Guidance on Delivery Restrictions
- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002
- Traffic Signs Manual, Chapter 5: Road Markings

Transport for London:

- Kerbside Loading Guidance

Streetscape Guidance details:

- TfL/SG13

At-grade pedestrian crossings

Introduction

When seeking to create a high quality walking environment, it is essential that safe pedestrian crossings be provided where pedestrian desire lines cross the carriageway. Desire lines should be 'true', not perceived, and take account of safety.

The design team should consider the impact of the crossing point on the appearance of the streetscape, and ensure it is integrated into the overall design and co-ordinated with other features such as lighting, tree planting, building entrances and side roads.

Whilst crossing points can change pedestrian desire lines, they will not be successful if they radically change the direction of flow. The provision of pedestrian guard rail to control pedestrian movement in order to counter poor design is not acceptable to TfL.

Design criteria

Several different forms of pedestrian crossings exist and are found on the TLRN.

- Uncontrolled crossings where pedestrians do not have priority over vehicles and must make a decision when it is safe to cross. Examples include pedestrian refuge islands, side road junctions, and signal controlled junctions without pedestrian phases

Pedestrian refuge islands provide a safe place for pedestrians to stand within the carriageway whilst waiting for a sufficiently large enough gap in vehicular traffic flows to cross one or more traffic lanes.

- Controlled crossings where pedestrians can establish priority over vehicles. Examples include zebras, pelicans, puffins, toucans and signal-controlled junctions with pedestrian phases

Controlled pedestrian crossings should be located on pedestrian desire lines, where sight lines and/or speed of vehicular traffic will not endanger pedestrians crossing the carriageway and where they will not cause severe congestion and delay public transport.

At junctions controlled by traffic signals, pedestrian phases are frequently introduced to provide a safe means to cross the carriageway. Pedestrians are invited to cross by farside signal heads.

- Zebra crossings are indicated by alternating black and white bands within a controlled area marked by zigzag lines accompanied by flashing belisha beacons. Pedestrians only have right of way once on the zebra crossing markings. This type of crossing is therefore not suitable when vehicle speeds are high
- Pelican traffic signal controlled crossings are marked with studs within a controlled area marked by zigzag lines. Pedestrians activate the crossing by pushing a button and waiting for vehicular traffic to be stopped by a red signal. Farside signal heads are used to invite pedestrians to cross when it is safe to do so. These are appropriate where pedestrian flows are high and/or vehicles travelling at relatively high speeds
- Puffin ('pedestrian user friendly intelligent') crossings are similar to pelican crossings but have near side pedestrian signal heads, kerb side detection of pedestrians to cancel pedestrian demands which are no longer required, and infra red on-crossing detectors to extend the all red period. This type of crossing is planned to replace the pelican type

Zebra, pelican and puffin crossings must have a minimum crossing width (between two rows of studs) of 2.4m.

- Toucan ('two can cross') signal controlled crossings combine pedestrian and cycle movements across the carriageway. These crossings have both nearside and farside pedestrian and cycle heads

Toucan crossings should have a minimum crossing width of 4m. No regulations define a minimum crossing width at pedestrian refuge islands. It is essential that the refuge island is large enough to contain the number of pedestrians and cycles (where applicable) likely to use the crossing, and there should be sufficient carriageway remaining to prevent vehicles passing too close to the island or footway, which can intimidate pedestrians.

Dropped kerbs and appropriately coloured tactile paving must be used to assist pedestrians, refer to sections Tactile paving and kerbs and drainage.

Good practice

Good practice principles associated with the introduction of street furniture, footway surfaces and tactile paving apply.

This can be achieved by locating traffic signalling equipment on other items of street furniture (street lighting columns), careful design of dropped kerbs and using inset covers to hide ironwork and the correct design of tactile paving.

Anti-skid surfacing should not be applied to the carriageway surface between the crossing studs as pedestrians with mobility impairment can experience difficulties in crossing. Coloured surfacing should not be used, unless green surfacing is required to assist in defining a cycle route at a toucan crossing.

Careful consideration must be given to the need to provide kerbside pedestrian guard railing. This should only be introduced where there is evidence that pedestrian safety could otherwise be compromised.

Carriageway drainage gullies should be located away from the pedestrian route across the crossing and outside any area enclosed by studs. Carriageway finished levels must enable surface water to drain away from the crossing point to prevent ponding at dropped kerbs.

Design teams must ensure that there is sufficient storage space on the footway adjacent to the crossing to permit waiting pedestrians to stand without obstructing the free movement of other pedestrians. This can usually be achieved by using a 5m crossing width on footways 2m to 3m wide.

When pedestrian crossings are introduced at locations where very large pedestrian flows exist (eg, outside public transport interchanges), it may be necessary to increase storage capacity by widening the footway into the carriageway and increasing the width of the crossing above 5m. Carriageway lane widths and signal timings need to be considered as part of this calculation.

When designing controlled pedestrian crossings, straight across arrangements are more sympathetic to creating uncluttered streetscapes than staggered crossings (with two independent crossings over each half of the carriageway) and should be the desired solution. Staggered crossings require a pedestrian holding place in the centre of the carriageway, which is either defined by kerbs or pedestrian guard railing and can also mean additional street furniture such as signal poles.

Where crossing distances are greater than 15m, the use of staggered crossings cannot be avoided without creating extended vehicle stopping time to allow pedestrians to walk across the road in one movement. To achieve straight-across crossings, design teams should consider analysis of signal timings over a section of highway to create even flows of traffic, preventing congestion at any one crossing.

When staggered crossings are unavoidable, design must be as simple and uncluttered as possible with the layout of stagger such that pedestrians on the island face on-coming traffic.

Crossings should be adequately illuminated in accordance with BS 5489 and BS EN 13201.

In making decisions about whether to install a pedestrian crossing, a recommended site assessment framework is described in LTN 1/95.

References

Statutory Instruments:

- Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions 1997

Department for Transport:

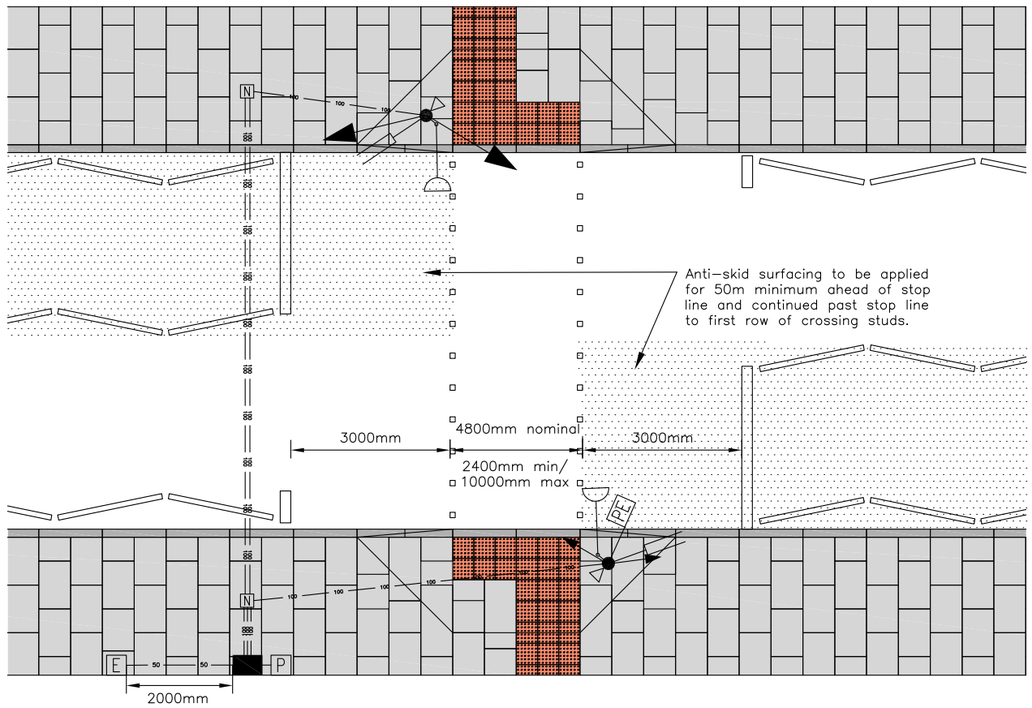
- Local Transport Note 2/95: The Design of Pedestrian Crossings
- Local Transport Note 1/95: The Assessment of Pedestrian Crossings
- Local Transport Note 1/98: The Installation of Traffic Signals and Associated Equipment
- Traffic Advisory Leaflet 1/01: Puffin Pedestrian Crossings
- Traffic Advisory Leaflet 1/02: The Installation of Puffin Pedestrian Crossings
- Traffic Signs Manual, Chapter 5: Road Markings

British Standards:

- BS 5489-1: Code of practice for the design of road lighting
- BS EN 13201: Road lighting

Streetscape Guidance details:

- TfL/SG01, SG02, SG03, SG04, SG05, SG06, SG07, SG08, SG09, SG10, SG11, SG12, SG17, SG18, SG26, SG27 and SG28



8 Technical guidance: street furniture

8 Technical guidance: street furniture

Introduction

Street furniture is the collective name given to the vertical elements within the highway. Most street furniture elements are located in the footway.

The need for additional elements of street furniture has expanded with the growth of traffic throughout London.

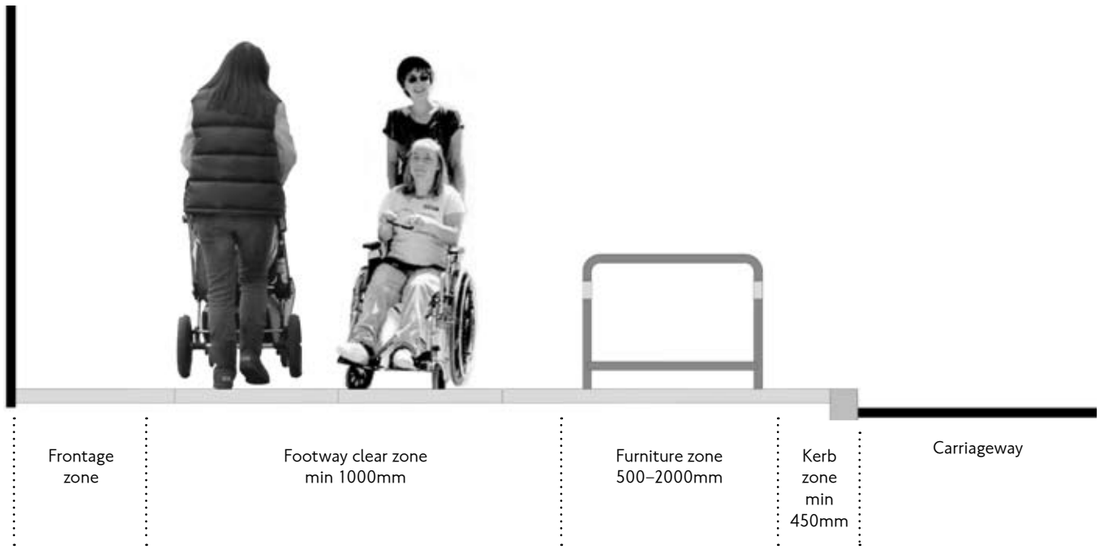
Increasing demands on road space has seen a rise in traffic management, safety, regulatory and enforcement equipment.

There has also been an increase in street furniture to serve the present day needs of pedestrians including improved bus stops, information and seats and kiosks.

The uncoordinated proliferation and inappropriate location of street furniture can cause problems for pedestrians, and for wheelchair users and people with mobility and visual impairments.

Temporary objects such as A-board advertisements, café tables and shop front displays that can encroach into the footway clear zone create a very real hazard to people with visual impairments.

Some elements, such as the primary traffic signals and signs, have fixed location criteria, whilst others have preferred positions. These requirements are noted in the technical sections.



General location principles

This section deals with the principles of locating street furniture within the footway, where all elements of street furniture are located between the kerb face and highway boundary.

Account must be taken of a number of interrelated factors:

- Available footway and verge widths
- Vehicle flows
- Pedestrian flows
- Parking and loading requirements
- Land uses adjacent to the TLRN
- Regulations governing street furniture size and location requirements
- Security

In general, the area between the kerb line and the highway boundary can be divided into four zones:

- Kerb zone
- Furniture and planting zone
- Footway clear zone
- Frontage zone

The relative importance, scale and treatment of each of the zones vary according to its location on the TLRN.

Kerb zone

The kerb zone is typically 450mm wide to allow vehicles to overhang and avoid the face of street furniture.

The kerb zone should be increased to 600mm where there is a severe camber or crossfall and where signs are mounted on the central reserve of dual carriageways.

A kerb zone of 600mm should be considered on roads with a 40mph design speed.

This zone should be kept free of street furniture to prevent it being damaged by vehicles.

Consideration may, however, be given to placing elements in this zone when:

- The footway clear zone is restricted
- Physical protection of pedestrians is required
- It is used as a traffic calming tool by restricting the apparent width of the road

It is essential to assess the camber or cross fall of the road to ensure that high-sided vehicles do not lean over the footway.

Furniture and planting zone

This is the zone where street furniture should be located and where, if space allows, street trees can be positioned in coordination with other items of street furniture, such as signage and lighting. This requires a professional understanding of the growth of trees and other vegetation.

The furniture zone may be paved or grass verge. Separating pedestrians from the carriageway increases their perception of safety and comfort, and is particularly important where traffic volumes are high.

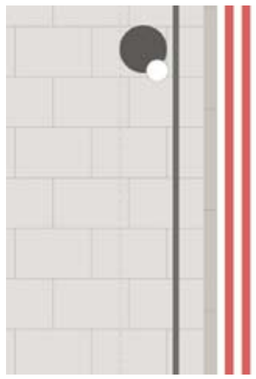
Where speeds are over 30mph, the width of the furniture zone should be the maximum possible to provide a greater degree of separation.

Design teams should consider the minimum and maximum widths for the furniture zone, taking account of other pressures on the footway such as the volume of pedestrians and vehicle loading provisions.

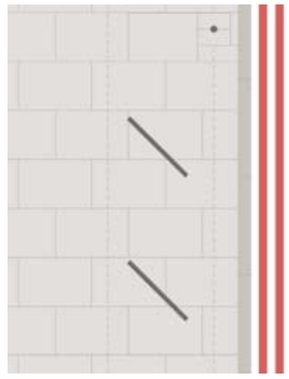
Furniture zone

Assuming that adequate clear footway and kerb zones can be provided, the width of the furniture zone can fall into the following basic categories:

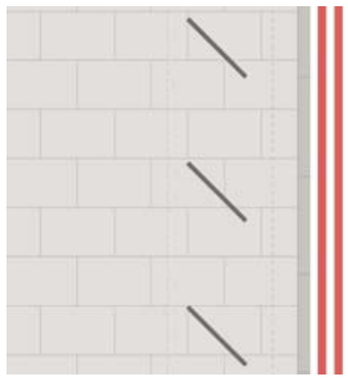
- 500–1000mm wide:
  Allows positioning of barriers, bollards, street lights, control boxes, seats, bins and cantilevered bus shelters with perch seats, but with no end panels



- 1000–1600mm wide:
  Allows positioning of telephone boxes and other large items of street furniture. Cycle racks can also be angled at greater than 45 degrees to the kerb line. This width permits the introduction of seats and street trees



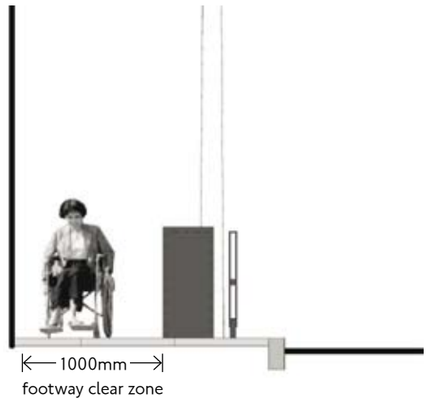
- 1600–2000mm wide:
  Allows positioning of cycle racks at 90 degrees to kerb line, kiosks and other structures, bus shelters with half and full end panels, and street trees



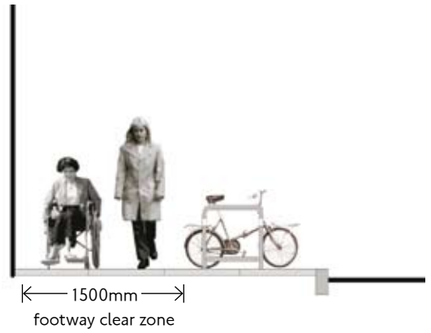
Footway clear zone

The footway clear zone is intended for the unhindered movement of pedestrians along the street, with this zone entirely free of permanent and temporary objects. Along these pedestrian desire lines, street furniture should generally be located to achieve particular clear widths:

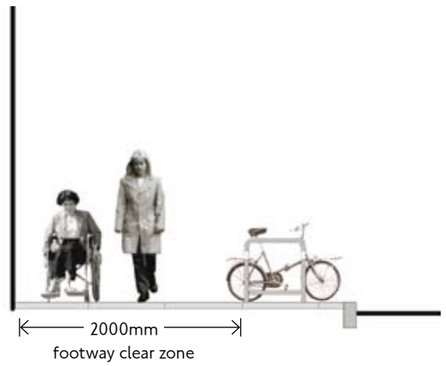
- 1000mm wide:
  Absolute minimum clear width between obstacles with a maximum length of restricted width of 6000mm



- 1500mm wide:
  Minimum acceptable clear width under most circumstances, giving sufficient space for a wheelchair user and person walking to pass one another



- 2000mm wide:
  The preferred minimum clear width that, under normal circumstances, allows two wheelchairs to pass one another comfortably



Frontage zone

The frontage zone is the area between the footway clear zone and the property line and highway boundary.

Wherever possible, this zone must be kept free of street furniture as it provides the best route for visually impaired people who use canes to walk along the street using building facades and property boundaries as a guideline.

In retail areas, a lack of obstructions allows window shopping.

Where the footway widths are narrow, safety essential street furniture may be located tight against the property boundary to ensure an uncluttered kerb zone.

Consideration must be given to maintenance and cleansing requirements.

If no furniture zone exists, larger elements of street furniture are difficult to incorporate into a narrow street. Alternative solutions may be:

- To locate service boxes, signal controllers, telephone kiosks, etc in any recesses in the building line
- To locate these items on side roads off the TLRN. Consideration must be given to operational requirements
- To build cabinets, where it is safe to do so, and post boxes into buildings. Way-leaves will be required
- To fix elements such as signs and street lights to buildings. Way-leaves will be required
- To negotiate with adjacent landowners to locate street furniture within private forecourts beyond the highway boundary

Building overhangs, shop signs, awnings, banners, planters, and drain pipes may encroach upon this zone and require statutory approval from the highway authority.

Approval for extension beyond the frontage zone into the footway zone must only occur where minimum clear headroom of 2300mm is maintained. 2100mm clearance below suspended signs is allowed.

Opportunities for attaching lighting and other elements of street furniture to buildings can have major visual and accessibility benefits in narrow urban streets with taller and continuous building frontages. This requires that time is allocated in programmes to achieve the required way-leaves and consents.

Good practice

Street furniture should be located so that people with visual impairments can anticipate their position and consistency of location is paramount.

All metal components of street furniture must be painted. For urban areas in central London (see map in Palette of materials – finishes) RAL 9005 (black) matt micaceous iron oxide should be used. Areas with high pedestrian flows must have an RAL 7004 (signal grey) visibility band. For other urban areas, surburban and surburban-rural fringe areas RAL 7004 (signal grey) or equivalent in matt micaceous iron oxide should be used. Areas with high pedestrian flows must have an RAL 9005 (black) visibility band.

Visibility bands are required on all street furniture in areas of high pedestrian flows, with the exception of pedestrian guardrails, seats, bell and wooden bollards.

In areas where graffiti and fly-posting are a problem, low profile, clear anti-poster finish is recommended. This coating should be applied up to a height of 3000mm on street lighting columns.

All street furniture which is no longer required for the effective operation of the TLRN should be removed. This requires co-operation between TfL teams and local authorities.

Alternative locations for existing and proposed street furniture may be considered. These include:

- Locating in building facades and building line recesses
- Fixing lighting and street signs to buildings or adjacent structures. Way-leaves will be required
- Combining elements of street furniture, eg, traffic signal heads on lighting columns
- Exceptionally, using the central reserve or an area of carriageway, eg. cycle parking in Kensington High Street which was endorsed by council members of the Royal Borough of Kensington and Chelsea. Expert safety advice must be sought

References

Legislation

- The Disability Discrimination Acts 1995 and 2005.

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002
- Traffic Signs Manual

Streetscape Guidance details:

- TfL/SG06, SG07, SG15 and SG16

Street lighting

Introduction

There is no statutory requirement to provide street lighting for the highway but there is an obligation on the highway authority to provide a safe network.

TfL therefore make a presumption in favour of street lighting throughout the TLRN.

The overall objectives of street lighting on TLRN roads are:

- To contribute to the safety of all street users by helping to reduce the incidence of night-time collisions
- To enhance security and the perception of security, particularly for pedestrians during the hours of darkness
- To ensure that lighting levels along the footways of the TLRN aid the journey of public transport users
- To improve the appearance and function of street lighting equipment

Lighting design

All lighting schemes on the TLRN must be designed to meet the requirements of BS 5489-1 and BS EN 13201, taking into account national guidance documents published by the Institution of Lighting Engineers. Expert advice should be sought from a lighting engineer who will be an important member of the design team.

The design team will need to select an appropriate lighting design class, with careful consideration to be given to the colour rendering index of the lamps, ie:

- For urban and residential roads the light source used should have a colour rendering index of at least 20
- In areas of social activity such as high streets with high night-time pedestrian use, the lighting source should have a colour rendering index of at least 60
- Where street crime is a major concern and the police use CCTV for prosecution, the light source should have a colour rendering index of at least 80

Special attention should be paid to the surround ratio value to ensure adequate illumination for pedestrians and cyclists. On all traffic routes (ME Class) except those with heavily trafficked adjacent footways or cycle tracks, lighting of the adjacent footway or cycle track should be achieved by applying surround ratio.

Unless the area is classified as a conflict area (CE Class) where the adjacent footways or cycle tracks are heavily trafficked or are routed away from the main carriageway, an appropriate equivalent S class of lighting shall be applied.

Footbridges and subways should be illuminated to BS5489-1. Overall and longitudinal uniformity values specified under BS 5489-1 and BC EN 13201-2 should be strictly observed for all classes of writing.

Lighting evaluation

The lighting evaluation should contain the following processes:

- Evaluation of adjacent land use:
  This requires that the street lighting designer considers the implications of the street lighting design on the surrounding environs
- Consideration of how the street is used:
  The design team must consider which street users need to be illuminated. This is usually mixed pedestrian and vehicular traffic on the TLRN. Consideration must be given to vehicle-only and pedestrian-only routes where they occur
- Evaluation of night-time activities:
  Many parts of the TLRN experience large pedestrian volumes. Other places where high levels of night-time pedestrian use can be expected are community centres, transport interchanges and places of tourist interest. These areas may also have CCTV coverage and may therefore require enhanced lighting levels and the use of white light
- Evaluation of special area status:
  Parts of the TLRN are within conservation areas and other special areas. The design team may consider, in liaison with key stakeholders, that an alternative to the style and finish of street lighting equipment in the palette of materials is appropriate
- Evaluation of the risk and perception of crime:
  TfL intends to reduce the risk and perception of crime. Home Office research has shown that most people are affected by the perception of the risk of crime, and feel particularly threatened where poor street lighting exists. The provision of good quality street lighting is therefore essential in areas where street crime is a concern

Pollution, light control and visual intrusion

TfL aims to minimise the visual intrusion of TLRN lighting columns into the daytime streetscape and to minimise light pollution at night-time.

The number of lighting columns should be kept to a minimum by using luminaires that allow wider column spacing. Expert knowledge is required to ensure the correct balance between the performance of the luminaire and column spacing.

Column heights should be as tall as possible provided they do not exceed the height of adjacent buildings or mature trees. Where large numbers of mature trees exist and canopy heights are low, consideration should be given to the column heights that place the luminaires where the canopy, allowing for natural growth, will not affect performance of the lighting installation. Where safety permits, lighting column positions should align with building lines, and not be placed in front of doors or windows.

Visually columns should fit into their environments, forming part of the general landscape backdrop, this is particularly important in rural areas.

Control of light pollution

Low pressure sodium sources are not to be specified on the TLRN. 'Skyglow' occurs when upward stray light is reflected back to earth and is predominately associated with low pressure sodium lighting where the large lamp size demands large deep bowl luminaires with limited optical control.

'Light trespass' occurs where highway light intrudes into adjacent land uses and the environment. On the TLRN it can be controlled by the use of high pressure sodium or metal halide luminaires with high performance optic and low profile or flat glass bowls. If necessary, purpose designed shields can be installed.

'Intrusive glare' is the uncomfortable brightness of a light source when viewed against a dark background. On TLRN streets illuminated to BS 5489 and BS EN 13201, glare control is to be achieved by:

- The use of high performance optics providing good light control in conjunction with low profile or flat glass bowls
- Complying with the threshold increment value requirements for traffic routes
- Confirming to Class G1 of BS EN 13201-2 table A.1 or higher class for subsidiary roads, footways and cycle tracks

All new street lighting on the TLRN should comply with the Obtrusive light limitations for exterior lighting installations contained in the Guidance notes for the reduction of light pollution (Institution of Lighting Engineers) based on the following streetscape character definitions:

Zone E4

- Urban civic, retail and commercial

Zone E3

- Urban residential
- Suburban commercial and industrial
- Suburban residential

Zone E2

- Rural-suburban fringe
- Special areas (open common and parkland)

The Zone E1 classification applies to areas of countryside such as National Parks and is therefore not deemed suitable for the TLRN.

Lighting equipment style

On most of the TLRN, TfL makes a presumption in favour of a simple contemporary visual style in preference to reproduction pastiche ('mock heritage') or feature styled equipment. Design teams may request an exception to the palette of materials in conservation or other special areas.

Columns and luminaires should be selected to achieve the specific night-time photometric performance with good column spacing and energy efficiency whilst blending into the streetscape in the daytime.

Details of the type of lighting equipment appropriate for the TLRN are shown in the palette of materials.

Luminaire size and style shall achieve a balance between the requirement to be as small in profile as possible and of the smoothest achievable form consistent with function, with high optical performance allowing good column spacing.

All external components (except the bowl) should be colour co-ordinated with the column (and bracket if used).

Photoelectric cell units should be integrated into the profile to reduce visual impact. Where flat glass luminaires are used, they should be configured so that the glass is horizontal.

Subway luminaires should be vandal resistant and prison standard. Footbridges should be illuminated by integrating the luninaires into the bridge structure.

When the street lighting designer specifies the use of brackets the following criteria applies:

- They should only be fitted when required to achieve photometric performance or aesthetic objectives
- They should co-ordinate with the form and proportion of the column with no change of size or 'step'
- The length is to be no more than 15% of the column height
- The joints between bracket and column are to be smooth and mechanically secure to ensure accurate alignment is maintained
- Bracket corrosion and finish are to match the column

Further important considerations include:

- Multiple step columns are not accepted on TLRN
- Doors are to be flush fitting with a door chain to prevent loss
- Fillets to support brackets should be avoided

Historic lighting equipment

The streetscape value of historic lighting equipment (which may be listed) should be evaluated by the design team, in liaison with key stakeholders. The equipment must be protected, maintained and refurbished to ensure it remains functional.

Original patterns, or patterns taken from the remaining equipment, should be used to replace individual units.

Lighting column location

The layout of lighting columns should generally be in accordance with the recommendations of BS 5489-1 for the road type and geometry.

The selection of opposite, staggered or single-sided column layouts should take account of the needs of pedestrians and cyclists to achieve the required illuminance on footpaths or cycle tracks as well as the carriageway itself.

Optimum column set back from the carriageway at the following speed limits should be as follows:

- Speed limit up to 30mph – set back 450mm (minimum)
- Speed limit over 40mph – set back 650mm (or back of footway)

At junctions of pelican, puffin and toucan crossings, lighting columns should, where possible, be positioned to enable primary signal heads (and associated pedestrian heads and push buttons) to be mounted on the column to reduce clutter within the footway and provide good illuminance at crossing points.

At junctions, the side road entry area should be adequately illuminated in accordance with BS5489-1 and BS EN13201-2.

Wall-mounted lighting

Where highway layout and frontage facades are appropriate, wall-mounted luminaires should be considered and is strongly encouraged. Wall bracket mountings and columns should not be mixed in any one street (or section of street). Electronic cables to wall-mounted equipment should be discrete and of a colour to blend in with the building.

Where the design team propose wall-mounted luminaires or equipment the consent of the frontage owner must be sought before work starts. Where the properties are listed, this must also include consultation with the local planning authority, who may require listed building consent. Adequate lead-in time must be allowed in the programme for this.

Feeder pillars should be carefully sited to avoid vehicular sight lines and to avoid obstruction of footways or cycle tracks.

TfL has an internal procedure relating to attaching streetlighting to buildings.

Good practice

To reduce street clutter, it is desirable to co-ordinate certain street furniture with street lighting columns. It is therefore essential to specify the proposed structural loads when specifying the columns as required by BS EN40. Typical coordination on the column structure could include:

- Carriageway luminaries
- Footway luminaries
- Traffic signal heads
- Traffic signs (subject to the approval of TfL Network Operations)
- Bus flags and timetables (subject to approval of TfL Buses)

And exceptionally:

- Litter bins
- Banners
- Festive lighting
- Flower baskets and brackets

All columns must be designed to BS EN40 and to accommodate a sign of class B, as defined in PD 6547.

Columns that require additional attachments or where additional attachments are likely to be installed in future years, shall be designed to accommodate the additional loading as required in PD 6547 and prEN 1991-1-4.

All columns must have reference labelling attached within the base compartment that enables a full audit trail back to the loading design calculations.

References

British Standards:

- BS5489: Code of practice for the design of road lighting
- BS EN 13201: Road lighting
- BS EN 40: Lighting columns
- PD 6547: Guidance on the use of BS EN 40-3-1 and BS EN 40-3-3

Institute of Lighting Engineers:

- Guidance Noted for the Reduction of Light Pollution, 2005
- ILE technical reports: various

Traffic signals and control boxes

Introduction

Without the use of traffic signals London's road network would quickly cease to function safely. However, the presence of over 4,600 installations on the TLRN and local authority roads also has a significant visual impact on London's streetscape.

The design of traffic signal controlled junctions and crossings is a technically demanding specialist subject. Advice from TfL's Traffic Signals team must be sought at the start of the design of any project involving new or modification of existing installations.

The design or modification of traffic signals should only be undertaken by designers and engineers with an expert and detailed knowledge of TfL's traffic signal specifications and practices. These specifications and practices have been developed over time to ensure that new installations are safe and comply with all relevant national standards.

Design teams working on streetscape improvements must work closely with TfL's traffic signal experts so that the designs of new or modified signals function safely and integrate with the surrounding streetscape.

Good practice

A proliferation of traffic signals and poles can add unnecessary clutter to the streetscape. In addition, signal controller cabinets and associated equipment can, if incorrectly positioned, create obstructions in the footway.

It is therefore important when design teams undertake a streetscape review, that the obstruction and visual intrusion of any existing traffic signal installations is considered in line with current TfL signals practice.

Design teams should ensure that junctions and crossings conform to current best practice in relation to urban design, accessibility, signal design and equipment used.

Where pedestrian facilities are provided, tactile paving, dropped kerbs, audible and/or tactile devices should be provided.

Signal backing boards should be fitted on TLRN roads with speed limits greater than 30mph or where there are problems with the sun on East-West roads, which may affect drivers' vision.

Traffic signal poles should be positioned to provide a minimum lateral clearance of 450mm from all signal equipment to the kerb face.

Traffic signal controllers should be sited to allow unimpeded use of the footway by pedestrians, wheelchair users and those pushing prams. They should not be located where they detract from listed buildings or other heritage features, unless there is no safe alternative.

Controller cabinets should be positioned to allow the outer case door and panels to be opened without causing unnecessary obstruction on the footway and provide sufficient clearance for signal operatives and maintenance contractors to work. Additionally, the signal needs to be visible from the control cabinet for maintenance purposes.

Controller cabinets should not obstruct other street furniture or mask waiting pedestrians from approaching vehicles.

Electrical feeder pillars should be sited at the back of the footway close against a wall or fence where generally they will be safe from vehicular collision but must not obstruct private property, doorways, accesses or shop windows or cause a hazard to pedestrians. They must also be positioned so that an engineer can work on the pillar without danger to themselves or others.

Pedestrian aspects are to be side-mounted in order to maintain carriageway clearance and maximise footway space.

Where tactile signals have been provided, the push button box is to be located where the tactile element can be easily reached by a person standing at the crossing. Precise mounting requirements (angle to the kerb) depend upon the type of crossing.

Inset covers should be provided to signals' draw pits.

The opportunity to minimise the amount of street furniture should be taken. This may include seeking opportunities to combine signal heads with street lights or replacing signal heads with the latest technology.

The number of supporting poles may be minimised by combining signal heads on one pole.

Where fly posting is a potential problem, low-profile anti-graffiti and fly posting finishes should be applied to controller cabinets. Alternative designs of controller cabinets which deter graffiti and fly-posting may also be considered.

The appearance and colour of the finish of cabinets should be consistent with other street furniture on the TLRN in the locality.

Redundant control equipment must be removed and the footway reinstated to match the surrounding areas.

TfL has an internal procedure that provides design standards for signal schemes in London.

References

Statutory Instruments:

- Traffic Signal Regulations and General Directions 2002

Department for Transport:

- Local Transport Note 1/98: The Installation of Traffic Signals and Associated Equipment

Streetscape Guidance details:

- TfL/SG01, SG02, SG03, SG05, SG12, SG17, SG18, SG26 and SG27

Traffic signs

Introduction

Traffic signs are provided by the highway authority to give directional and highway information and warning of potential hazards.

Signs may also serve to give notice of traffic regulations restricting traffic movements. Traffic signs may have a fixed legend or be of variable message type.

Technically, traffic signals and road markings can be described as traffic signs but are dealt with separately for streetscape purposes.

Design criteria

Statutory requirements and detailed guidance on the design of signing for the public highway are provided in the Traffic Signs Regulations and General Directions 2002 (TSRGD).

For sign legends not covered in TSRGD, separate special signs authorisation is required from the Department for Transport (DfT). Further guidance is given in the Traffic Signs Manual (TSM) and Local Transport Note (LTN) 1/94 gives guidance on directional signing.

Traffic signs should generally be located in the nearside footway or verge with a minimum clearance of 450mm between any part of the sign assembly and the kerbed carriageway. This minimum clearance should be increased to 800mm on un-kerbed roads and roads subject to a 40 mph speed limit or greater.

The recommended clearance of traffic signs in pedestrian-only footways is 2300mm (absolute minimum 2100mm) but this may be increased to discourage vandalism.

Good practice

In accordance with the general principles for locating street furniture, design teams should provide the minimum number of signs to achieve directional, informatory or regulatory needs. This will reduce street clutter and optimise the visibility and legibility of those signs essential for road users.

Signs should be located to minimise visual and physical intrusion into the streetscape. Where practicable, the back view of large signs can be screened by street tree planting.

Sufficient space must be given to ensure tree growth does not obscure the sign or affect colour contrast between the sign and original streetscape.

Design teams should refer to the TSM in order to select the current size of regulatory or warning sign appropriate for the traffic speed.

The smallest text size appropriate for the traffic speed should be used to keep overall sign sizes to a minimum. Design teams should consider reducing the number of destinations and complexity of directional signs to optimise legibility of essential information, subject to any strategic or local requirements.

Design teams should minimise the number of posts needed for each sign.

This may be achieved using cantilevered signs from one post across footways to maintain maximum free space for pedestrians. The single post should be located at the front (kerb-side) of the footpath as experience has shown that vehicles mounting the kerb often strike cantilevered signs with posts at the rear of the footway, because the sign overhang is not seen.

Single posts are usually of a greater diameter to ensure sufficient strength to accommodate the additional wind loading. TfL is aiming for well-designed, simple and neat support structures, preferably with round posts. Sign faces can be protected with a protective overlay film when the sign is manufactured, which offers excellent protection against fly-posters and graffiti.

The finish of sign posts and backs of signs should co-ordinate with lighting columns and similar street furniture within a given locality and be designed to be as inconspicuous as possible. This will generally require finishes to be black in Central London and grey in Outer London where larger signs are used.

Recent changes to TSRGD allow a single regulatory sign to be erected where a single carriageway road is less than 5.0m wide. The centre of the single sign should then be within 2.0m of the edge of the carriageway (this does not apply to speed limit signs).

The use of grey or yellow ‘backing boards’ behind signs should be avoided unless considered absolutely vital to road safety. Signs should not generally be illuminated unless legally required or there are other over-riding safety reasons.

When regulatory, statutory or small advisory traffic signs repeated on posts are to be mounted along the edge of a carriageway, the height above the footway of the bottom sign should be kept uniform.

Traffic signs in the vicinity of cycleways and equestrian routes should be positioned carefully to avoid conflict with riders.

Where practicable, smaller traffic signs (up to 0.6m2) should be mounted on lighting columns. Expert engineering advice should always be sought if it is proposed to fix larger signs to lighting columns.

Smaller diameter ‘no entry’, ‘no left or right turn’ and some other restrictive signs are allowed in the TSRGD to be mounted on traffic signal heads. These can be used in place of separate signposts, so reducing street clutter.

Design teams should use low ‘hoop’ mounting for central island keep left signs with up-lighting as an alternative to plastic illuminated bollards in urban areas. Expert advice should be sought from a signs specialist to ensure compliance with TSGRD.

Legislation, statutory powers and consents

Only TfL has powers to erect permanent traffic signs on the TLRN, or permit traffic signs to be erected.

All signs erected on the TLRN must comply fully with TSRGD. Signs requiring legal backing by road traffic orders can take up to three months to process and adequate time must be allowed in programmes to accommodate this.

To reduce the number of posts which contribute to street clutter, the design team should explore opportunities for mounting traffic signs on other highway furniture or structures or frontage buildings.

Where traffic signs are not erected on dedicated posts, the adequacy and suitability of support should be checked.

Permission should always be sought for erection of signs on to frontage buildings from the building owners. Time to achieve this will need to be allowed in project programmes and agreements must allow for access and maintenance.

Design teams should referr to the procedure for affixing signs and equipment to rail overbridges by Transport for London.

References

Statutory Instruments:

- Traffic Signal Regulations and General Directions 2002

Department for Transport:

- Traffic Signs Manual
- Local Transport Note 1/94: The Design and Use of Directional Informatory Signs

Variable message signs

Introduction

Variable Message Signs (VMS) have been in use for many years, but the introduction of microprocessor control and matrix displays has provided increasing opportunities for their use in the management of traffic and the provision of information to road users.

VMS can display a variety of symbols and textual messages, including colour presentations and mandatory signs, for rapid assimilation by drivers.

The aim of using VMS is to provide drivers with mandatory or advisory information at the roadside relating to situations a distance ahead or in the immediate vicinity. They can also display real-time information.

Design criteria

VMS can be used where greater flexibility is required and where a message is not required to be displayed permanently.

VMS are costly to install and are generally used only where particular problems occur or where the accident risk is high, there is a need for flexibility in the range of messages and the cost can be justified.

VMS are considered as a successful form of traffic management, particularly on the grounds of safety and TfL are implementing an expansion in their use.

Three general types of technology are employed for VMS, although it is possible to combine technologies within the same sign:

- Electro-mechanical – rotating planks with two or three faces or prisms used to give versatility to a standard fixed-faced traffic sign
- Reflective flip-disk – matrix of disks, one side black, the other fluorescent, flipped magnetically by electrical current. These signs are well suited to showing combinations of letters or symbols as a message
- Light-emitting – fibre optic or light-emitting diode technologies. The major advantage of these signs is that a greater range of messages can be displayed than for reflective technology signs

When VMS are used as warning signs, it is usual for them to be fitted with amber-flashing lanterns.

Sign designers need to consider a number of factors including:

- Sign sizes
- Character height
- Legibility
- Contrast and viewing angle
- Ambient illumination levels and expected approach speeds

The material and finish of sign posts should co-ordinate with other street furniture on the TLRN.

Good practice

Messages must be consistent and comprehensible to drivers.

VMS are usually large and make a significant impact on the streetscape. It is important that design teams appreciate their overall scale in relation to other streetscape elements and that they may not be appropriate at all in conservation areas.

Mounting heights must always be increased where signs are adjacent to cycle or equestrian routes.

Authorisation

The appearance and legend of VMS signs should conform to Regulation 58 and Schedule 15 of the TSRGD.

Sign designs and formats not conforming to the TSRGD are required to be authorised by the Secretary of State.

Applications for authorisation should in the first instance be addressed to the relevant Government Regional Office or the Highways Agency for trunk roads in England.

References

Statutory Instruments:

- Traffic Sign Regulations and General Directions 2002 (Regulation 58)

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges, Volume 8

Pedestrian direction signs

Introduction

Pedestrian direction and information signs are provided by the highway authority to assist pedestrians that navigate to local destinations.

In some areas pedestrian directional signage form part of the Legible London project, which is an integrated wayfinding system of information display products.

Design criteria

Pedestrian direction and information signs should be located within the public footway or verge at points where street users begin their journey as a pedestrian.

All pedestrian signs erected on the TLRN must comply with the TSRGD. Where pedestrian routes simply cross the TLRN, pedestrian signs may be consistent with the adjoining local authority's design, subject to compliance with TSRGD.

Pedestrian signs need not be illuminated by means of retro-reflective material or internal or external lighting.

When the signs are mounted on dedicated posts, a minimum clearance of 450mm should be provided between any part of the sign assembly and the kerbed carriageway. This should be increased to 800mm on un-kerbed roads and roads subject to a 40mph speed limit or greater.

Good practice

Design teams should provide only the minimum number of pedestrian signs to achieve the objective of giving clear guidance.

Like all signs, pedestrian direction and information signs should be located to minimise visual and physical intrusion into the streetscape.

Minimising intrusion can sometimes be achieved by placing signs, on existing lamp columns, frontages of buildings, or at low level on pedestrian railings, as an alternative to mounting on dedicated posts.

To limit the numbers of signs, but still assist pedestrians, design teams should limit destinations to:

- Public transport facilities
- Tourist information centres
- Recognised tourist destinations
- Buildings or locations open to the public and attracting large numbers of people
- Public toilets

The use of standard pictograms to increase legibility of signage and understanding for people may be used in addition to approved text.

Slim-line information boards are acceptable on the TLRN subject to compliance with TSRGD and provided that they do not cause obstruction (see also the Information Boards section).

Authorisation

All pedestrian direction signs erected on the TLRN must fully comply with the Traffic Signs Regulations and General Directions, 2002.

Only Transport for London has powers to erect pedestrian signs on the TLRN, or permit pedestrian signs to be erected.

Where pedestrian signs are not erected on dedicated posts or other highway furniture or structures, permission should be sought for erection on to building frontages or railings.

References

Statutory Instruments

- Traffic Signs Regulations and General Directions 2002

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Streetscape Guidance:

- Palette of materials:
  Pedestrian direction signs, Legible London

Streetscape Guidance details:

- TfL/SG15

Roadside cameras and CCTV

Introduction

Roadside cameras are used to enforce traffic regulations such as speed limits, bus lane restrictions and London's central London congestion charge.

Closed circuit television cameras (CCTV) are used to provide information on traffic congestion and to assist the Police with enforcement duties.

Design criteria

Roadside cameras require an electrical supply and a clear, unimpeded view of the highway.

Speed enforcement cameras also require associated carriageway markings to support information recorded by the camera.

While some CCTV cameras may be attached to buildings or structures, many are located on high masts.

Fixed speed camera housings must be coloured yellow either by fully painting both the front and back of the housing or fully covering both the front and back of the housing with retroflective sheeting. The location of low-level roadside cameras for speed, traffic signal or bus lane enforcement also needs to be conspicuous to avoid any claims of entrapment.

CCTV cameras should be mounted on the most slender poles possible but must not be subject to camera shake.

Good practice

The location of roadside cameras is almost entirely governed by the function they are required to perform and the area of view they are required to record.

CCTV cameras, although smaller than speed enforcement cameras, impact on the streetscape when mounted on columns. Wherever possible these should be attached to adjacent buildings or structures, provided that the owner gives consent and subject to planning and listed building consent as necessary.

Mounting CCTV cameras on existing lamp columns is not recommended because the columns are not sufficiently rigid to prevent camera shake.

Where CCTV cameras are located on slender poles, the control equipment should be located separately in a cabinet on the footway, in accordance with the guidance on traffic signal control cabinets. Low-level roadside cameras can be situated on a standard 76mm pole.

TfL is commencing dialogue with London local authorities to establish a partnership which will help to reduce the proliferation of cameras by promoting sharing and multi-task equipment.

Authorisation

Section 63 of the Road Traffic Regulation Act 1984 as amended by the Transport Act 2000 (Section 75)

Planting

Introduction

Soft landscape areas exist on the TLRN, ranging from street trees in urban areas to wide grassed and planted verges in the rural-suburban fringe.

These offer visual interest, amenity value and provide a habitat for wildlife. TfL aims to protect and enhance this resource.

Improvement projects may offer opportunities to add to or improve the soft landscape resources on the TLRN.

Design criteria

Specialist advice from a landscape architect and, for street trees, an arboriculturist, must be sought to ensure that proposed planting is appropriate for its location.

Maintenance and management of planting must be taken into account in the design process and specialist advice sought from TfL's Route Managers – Arboriculture and Landscape.

Raised planters and schemes requiring long-term irrigation are not sustainable and are therefore rarely appropriate on the TLRN.

Street trees

Introduction

Street trees are an important visual and environmental asset on the TLRN.

Trees provide visual interest, shade, shelter, a place for wildlife and a contrast to the built environment. They not only help to define or reinforce the character of a locality, making attractive places for people to live and work, but they also help to modify the local climate by providing shade and trapping pollutants in the form of small particles.

Street trees are extremely difficult to establish on the TLRN. TfL therefore aims to protect and maintain its existing tree resources.

New planting

The success of new tree planting depends upon an understanding of the tree's requirements. To achieve this a number of factors must be considered:

- Underground conditions, especially the degree of compaction
- The location of underground services
- Tree spatial requirements including the proximity to boundaries, buildings, kerb-lines and street furniture

Failure to understand fundamental aspects of tree biology will result in tree failure. Expert arboriculture advice must be sought.

The same principles apply to street trees planted in grassed verges or planted areas, and in paved areas.

The former are less vulnerable to physical damage and tend to establish better than those in paved areas. In paved areas, opportunities for new tree planting on the TLRN are limited unless footway reinstatement works allow reconstruction of the sub-base to form a medium suitable for both tree root survival and growth and support of the footway.

TfL is looking for opportunities to trial the results of research conducted on different planting media that will demonstrate how new trees can thrive in paved areas.

Design criteria

Individual street trees as replacements for felled trees or as new streetscape elements will always be required on the TLRN.

Landscape architects will be required to consider the design effects of individual trees to determine whether avenues, or group of trees are appropriate for the location and streetscape character area.

This must be done in liaison with an arboriculturist who will advise on species selection and whether the design intention is achievable in terms of ground conditions.

Input from ecologists may also be required in the choice of species where the project is in or adjacent to an area of biodiversity interest.

It is reasonable to expect that street trees will continue to be planted in conventional tree pits but these must meet minimum design criteria.

Before tree planting locations are confirmed, it is essential to establish existing ground conditions. Most important is the ability of the existing soil, sub-soil and sub-base to allow tree roots to survive and grow beyond the confines of the tree pit.

A free draining and aerobic growing medium is essential. Failure to provide this will result in the death of trees or roots may grow up to the ground surface where they may cause a trip hazard.

Street trees in grassed verges will usually establish in pits of 1000mm x 1000mm x 800mm deep.

Street trees in paved areas require the maximum growing medium possible.

A minimum of 1500mm x 1500mm x 800mm deep is recommended for paved areas on the TLRN. This must only be used if tree roots can expand beyond the tree pit into a free-draining aerobic growing medium. Expert arboricultural advice must be sought.

Trees and services can co-exist. However, high voltage electricity cables may be damaged by the effect of soil drying as a result of root activity.

Irrigation systems may be used only if tree pits have adequate drainage and water is directed through a root ball. A drainage layer at the base of tree pits does not meet this purpose.

The detail of the footway surface around the tree is critical. It is essential that water and air can enter the root zone. Materials which form a barrier over the unpaved surface of a tree pit have not been proven to work on the TLRN and should not be used until they have been trialled.

Footway sealants should not be used near trees and root zones. It is important for the footway surface at the tree pit to be visually consistent with that around it, and to avoid any obstacle to pedestrian movement or trip hazard.

The scale of the TLRN supports the use of large-growing tree species. Smaller species and cultivars are acceptable in some areas. Fastigiate trees tend to lose their shape and are rarely appropriate. Expert arboricultural advice must be sought.

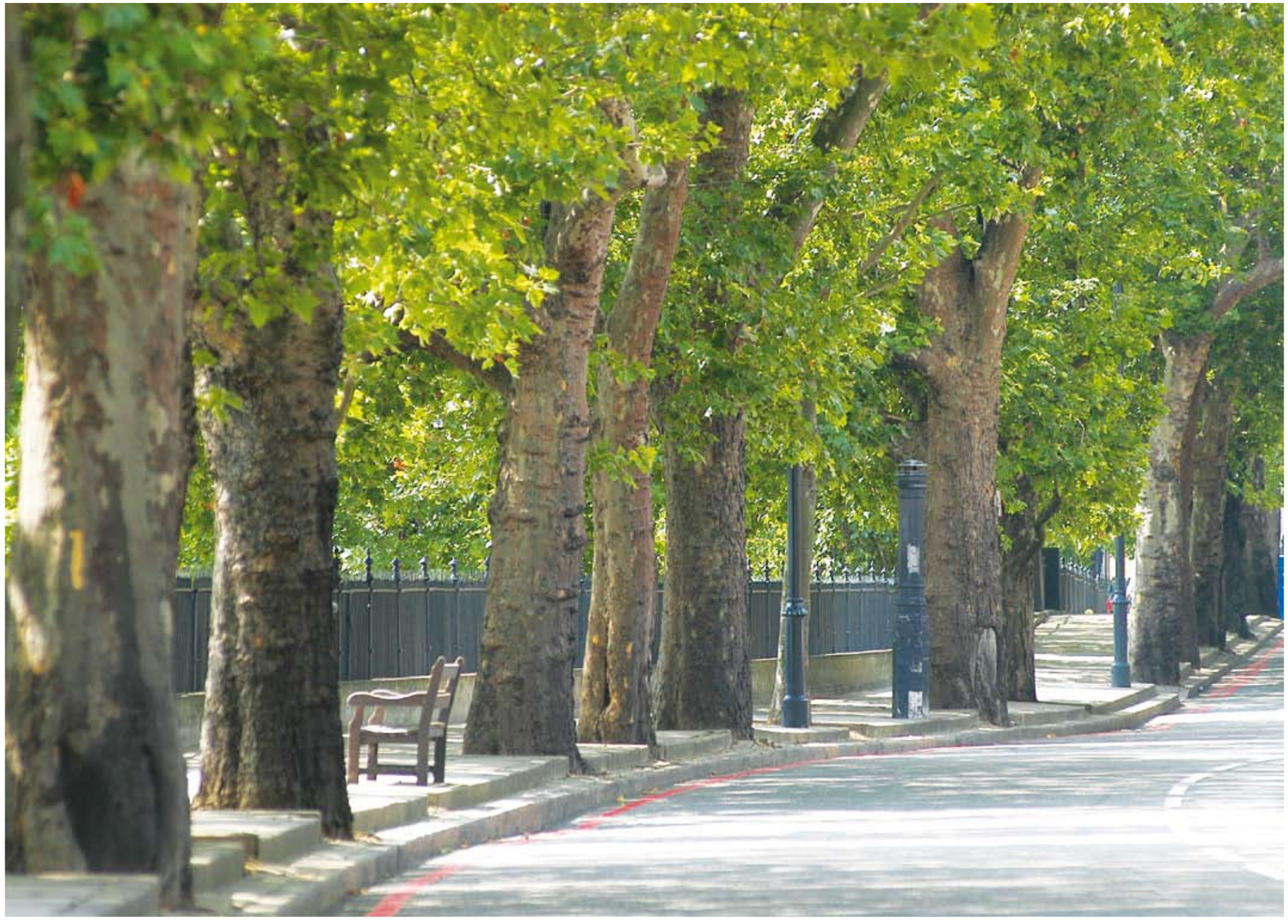
Tree supports should be selected on the advice of TfL's Route Managers – Arboriculture and Landscape.

Tree grilles and grids present maintenance difficulties and should not be used. Stainless steel edging should be used around the edges of the tree pit.

Trees often make an important contribution to the appearance of conservation areas, and so are given special protection. Liaison with the local planning authority is required with regard to the removal of any trees in a conservation area or those protected by a tree preservation order (TPO).

No street tree shall be removed from the TLRN without the approval of the Director of Road Network Management, in accordance with TfL London Streets' procedure. In the case of trees belonging to third parties, TfL will follow the same procedure and seek appropriate approval to remove as a last resort.

Design teams must obtain expert advice from TfL's Route Managers – Arboriculture and Landscape before approving and commencing any works that may impact on existing trees or involve the planting of new trees on the TLRN.



Reference

National Joint Utilities Group (NJUG):

- Volume 4: NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2)

Transport for London:

- Urban tree planting research, 2001 Richards, Moorehead and Laing

Streetscape Guidance:

- Technical guidance: street furniture

Streetscape Guidance details:

- TfL/SG15, SG16, SG33, SG34 and SG 35.

Cycle parking facilities

Introduction

Cycle parking should be provided where there is a need and it can be practically fitted within the street.

The provision of formal cycle parking facilities at public transport interchanges will help cyclists to make integrated journeys.

The increase in people cycling in London is increasing demand on cycle parking facilities.

The lack of secure cycle parking and storage facilities is often quoted as a reason why more people do not cycle.

It is accepted that the introduction of additional cycle parking facilities will introduce further elements into the streetscape. They therefore need to be carefully located and designed to minimise their visual impact, and the potential to create an obstruction in the footway.

The Sheffield (or inverted U) stand is commonly used as a short term parking facility and is appropriate for use on the TLRN.

Short-stay parking facilities should be provided close to key destinations.

Long-stay secure facilities should be provided at transport interchanges and town centres but these are not considered appropriate on the TLRN.

Good practice

Cycle parking facilities on the TLRN are generally located the footway. Care must therefore be taken to locate them out of the footway clear zone.

If cycle parking facilities are provided on the carriageway alongside the kerb, they should be protected by islands and illuminated signs.

Every cycle parking facility should be highly visible and well lit and clear of pedestrian and vehicle sight lines.

Locations under overhanging trees should be avoided.

Sheffield-type cycle stands on the footway should be placed 600mm from and parallel to the kerb, not at the back of the footway.

Where footways have sufficient width, cycle stands should be set at either 45 or 90 degrees to the kerb. In this arrangement they occupy a smaller area of footway for a greater number of stands.

When cycle stands are grouped together, a minimum spacing of 1000mm should be provided between stands to allow access and 1200mm is preferred.

At locations where cycles and stands are subject to vandalism, the use of de-mountable stands should be considered to aid maintenance. The visual impact of cycle stands can be reduced if they are placed between other items of street furniture, especially tree planting within an organised street furniture zone.

A tapping rail will usually be required on cycle stands so that an empty stand can be identified by a visually-impaired pedestrian using a white cane.

A black nylon-coated finish offers protection from damage by bicycles and meets visibility criteria. Alternatively, stainless steel with a black visibility band may be used.

Covered structures will require planning approval from the local planning authority.

References

Department for Transport:

- Traffic Advisory Leaflet 5/03: Key Elements of Cycle Parking Provision
- Technical guidance can be found in many other Traffic Advisory Leaflets

Transport for London:

- London Cycling Design Standards, 2005

Streetscape Guidance:

- Palette of materials: Cycle parking
- Technical guidance: street furniture

Streetscape Guidance details:

- TfL/SG15 and SG16

Motorcycle parking facilities

Introduction

In the last decade there has been resurgence in the ownership of motorcycle, scooters and mopeds which has increased pressure on motorcycle parking facilities.

Generally, parking facilities for these vehicles are provided within the carriageway and located to assist motorcyclists in making integrated journeys, such as secure parking at public transport interchanges.

Design criteria

Motorcycle parking bays are marked with 50mm wide broken white lines on the carriageway in accordance with the TSRGD and supported by means of a traffic regulation order.

Motorcycle parking facilities should offer:

- A well drained, well maintained site
- Even surface levels with shallow cross falls or gradient
- Non-slip carriageway surface
- A surface to resist point loadings of the stands attached to motorcycles, especially in warm weather
- Anchor points for securing motorcycles

Ground level anchor points provide the least visual intrusion, but can be dirty to use if they have to be pulled out of the ground and they can jam, with the potential to result in a trip hazard or obstruction on the carriageway.

Raised anchor points are generally provided at a height of 450-600mm in the form of a continuous rail, at the edge of the carriageway. This rail can present a trip hazard unless it is integrated with a pedestrian guard rail. Pedestrian guard rail should be located to allow a continuous bar to line up with kerb face. However, it should be noted that raised anchor prints are visually more intrusive than ground anchors.

Good practice

Motorcycle parking should be placed as close as possible to locations that will attract motorcyclists, such as shops, town centres and transport interchanges.

Parking bays should be sufficiently large to accommodate a number of motorcycles so that the facility is self- advertising. Ideally, motorcycle parking should be positioned where formal or informal supervision can take place. The bays should be of sufficient size to allow adequate manoeuvring space.

The bays should be well lit and away from any overhanging trees and vegetation which may result in bird droppings falling on the motorcycles.

The bays should be located away from pedestrian crossings where parked motorcycles may cause visibility problems for wheelchair users.

Authorisation

Section 63 of the Road Traffic Regulation Act 1984 as amended by the Transport Act 2000 (Section 75 [2]) sets out the powers of authorities Section 32 or 45 of the Road Traffic Regulation Act 1984 for on-street parking provision.

References

Statutory Instruments:

- Traffic Signs Regulations and General Directions 2002

Department for Transport:

- Traffic Advisory Leaflet 2/02: Motorcycle Parking

Motorcycle Action Group:

- A Guide to the Design and Provision of Secure Parking for Motorcycles, 2002

Bus stops

Introduction

The provision of well-designed bus shelters at bus stops is important in improving the total journey quality of people using buses. TfL London Buses has a range of shelter designs and formats.

It is also important to recognise that the bus stop is part of the streetscape rather than simply a location along a bus route where buses stop.

Where projects involve the design of bus stations, contact LBSL Infrastructure Development.

Design Criteria

The shelter design must also be able to accommodate the numbers of pedestrians likely to wait for buses and bus information systems. The choice of style, size and configuration must be agreed with TfL or the appropriate highway authority on a borough road.

The location of bus stops will be decided on policy, consultation and operational considerations and address passenger convenience, pedestrian and traffic safety, and frequency of bus services.

Consideration should also be given to the impact of the bus stop on commercial and residential land uses, such as inconvenience to adjacent property users and the visual impact on sensitive landscape and townscape locations and listed buildings.

Street clutter in the boarding/alighting zones should be avoided to allow full accessibility. Bus boarders permit the full use of the footway.

Good practice

The footway should be well-laid and drained in the vicinity of the bus stop. The bus stop shelter and surrounding footway should be well illuminated and maintained.

Seating, information boards and litter bins should be provided where space allows.

TfL London Buses have designed a bus stop flag. Design teams should seek to maintain the consistent use of this flag design.

Design teams should note that the size of bus stop cages means that there are sometimes limited opportunities to site bus stops and shelters in busy retail areas. In some circumstances it may be appropriate to combine the bus stop flag with street lighting.

Where footway widths allow, bus shelters with half-end panels and flags located at the shelter can be used.

Where there is inadequate space for a shelter, a free standing unit with integral flag, countdown information and perch seat may be provided.

The finish should be consistent with other street furniture on the TLRN within the locality, as required by this Guidance.

Authorisation

The Highways Act 1980 allows local Highway Authorities to give consent for objects to be sited on the highway.

TfL's bus stop flag is a traffic sign as defined by the Traffic Signs Regulations and General Directions 2002, and is erected only after consultation with the highway authority. TfL's free-standing bus stop units and roadside ticket machines are permitted under the Greater London Authority Act 1999, although Planning Consent for roadside ticket machines is occasionally required by local authorities. TfL have powers under Section 104 of the London Passenger Transport Act 1934 to erect bus shelters on the public highway with the consent of the highway authority.

In addition to the provisions of the London Passenger Transport Act 1934, local authorities may themselves provide passenger shelters where TfL is unable to do so, granting licences to erect and maintain them. Advertisements on bus shelters require the owner to apply for consent under the Town and Country Planning (Control of Advertisements) (England) Regulations 2007.

References

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Transport for London

- Accessible bus stop design guidance – Bus Priority Team technical note BP1/06, January 2006
- Bus pre-signal assessment and design guidance – Bus Priority Team technical note BP1/05, July 2005
- Bus priority at traffic signals keeps London's buses moving – Selective Vehicle Detection (SVD), January 2006
- Traffic calming measures for bus routes – Bus Priority Team technical note BP2/05, September 2005

Bus intelligence technology

Introduction

Bus stops are now being fitted with Countdown indicators, which show the arrival times in minutes for approaching buses as well as indicating which routes are running.

They can also display special messages to passengers regarding information on traffic delays or forthcoming road works.

The real time information is usually displayed either on a panel attached to the roof of a bus shelter and in a small number of locations on a free standing unit.

Real time information is obtained using an Automatic Vehicle Location (AVL) beacon system.

Design criteria

Countdown information displays are usually fixed to bus shelters and in a few instances to free standing units close to the bus stop post.

AVL beacons are always attached to other items of street furniture and are powered by batteries. They do not require any external feeds.

Bus Priority uses another type of beacon and these require an external power source. They are always fitted on their own poles and never use existing street furniture. There are some circumstances where a Bus Priority beacon needs to be located very close to an AVL beacon. Where this occurs, the Bus Priority beacon is set up to act as a ‘dual beacon’ with both Bus Priority and AVL capabilities.

The beacons need an unobstructed view of the carriageway to minimise interference of signals transmitted between the bus and the beacon.

Good practice

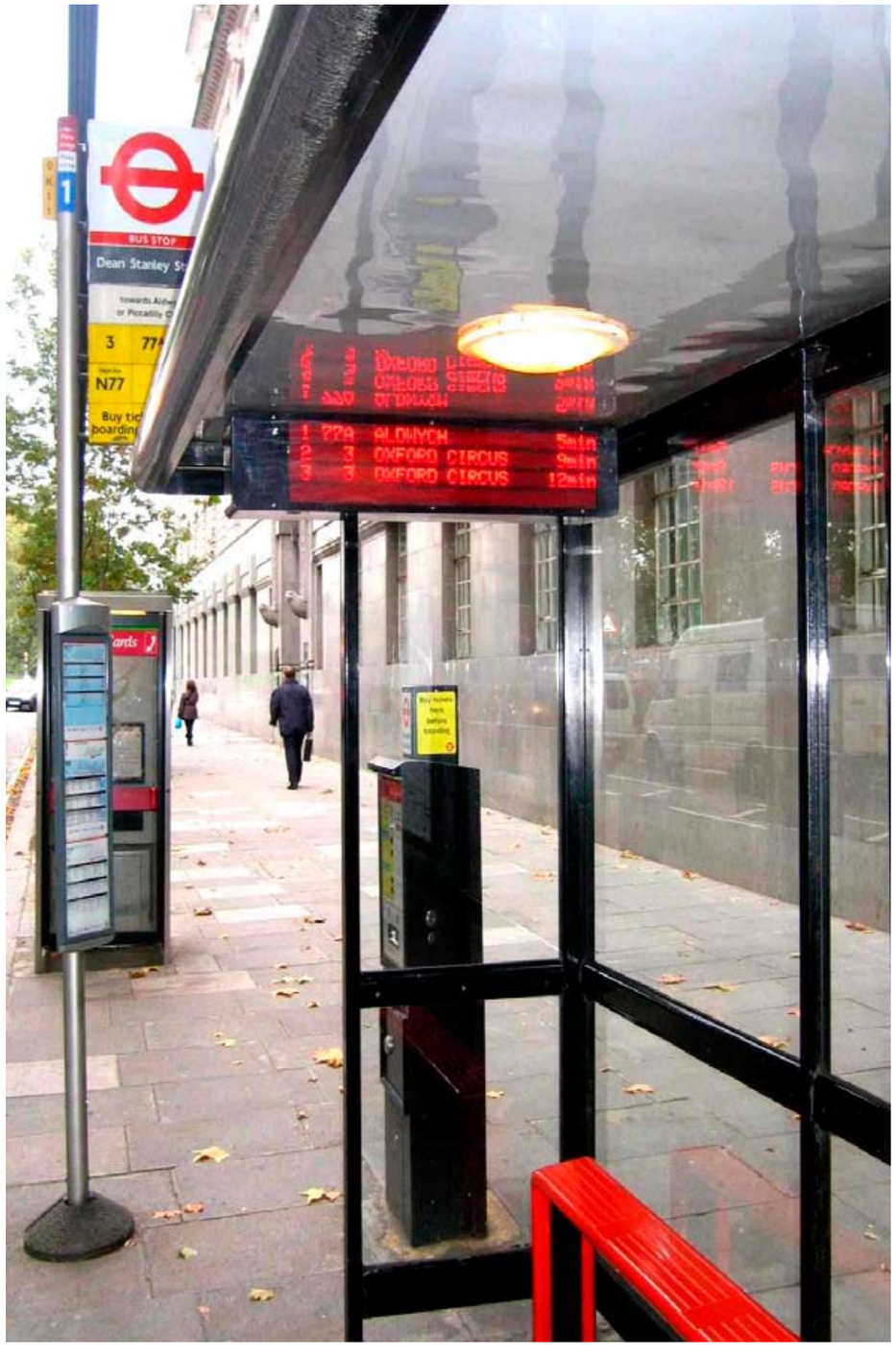
The principles of good streetscape design in relation to street furniture apply to busintelligence systems.

When separate power supplies are required, the feeder pillar should be located at the back of the footway.

Reference

Transport for London:

- Guidance on bus intelligence systems, ‘Countdown for London’



Trams

Introduction

Trams are a high volume method of public transport. They are particularly important for the mobility impaired as they provide guaranteed step-free, gap-free access. They have also been found to increase regeneration in the areas in which they are introduced.

London Trams, a division of London Rail, is responsible for overseeing the operations of the Tramlink system, which is a 28km network that operates in and around the Croydon area. The creation and modification of tram stops within London are the responsibility of London Trams.

Design criteria

The position of tram stops should be determined by the requirements of local users and shaped around the origin and destination of these users. In particular stops should be located so as to provide minimum walking distances for interchange between modes.

Tram stops should form an integral part of the highway and should be freely accessible. The design of stops whilst presenting a positive corporate image must be sensitive to local community views and needs.

Platform widths must be designed to cater for the levels of passenger flow predicted by the demand model. The minimum width between tramway edge and any structure will be 1500mm. The nominal minimum platform width will be 3000mm for side platforms and 5000mm for island platforms. Side platforms with absolute minimum width of 2000mm may be considered where justified by passenger and pedestrian demand profile and agreed with London Trams on the basis of risk and value management assessments.

All platforms are to be designed such that the nosing is 315mm above rail level for a tram with a door threshold at a nominal 350mm above rail level. Where stops form part of or extend out of the footway there will as far as is reasonably practicable be no step or barrier between stop and footway.

Good Practice

Signalised pedestrian crossings across the highway will not generally be required at each end of each platform, however a designated (uncontrolled) crossing point will be required. The provision of a signalised crossing will be dependent on pedestrian desire lines and sight lines and vehicle flows and will be determined using risk assessment and industry guidelines/ standards. Where reasonably practicable, On street stops should be sited to make use of existing pedestrian crossing facilities.

Highway arrangements at on street stops shall be designed to minimise the speed of traffic through or around the stop. The layout of on street stops must be designed to minimise the risk of vehicles mounting the platform or of hitting the platform edge.

Where stops form part of or extend out of the footway there will as far as is reasonably practicable be no barrier between stop and footway.

Specific consideration must be given to provision for cyclists at track sharing stops.

References

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure

Office of Rail Regulation:

- Guidance on Tramways: Railway Safety Publication 2

Transport for London:

- Trams Customer Environments

Taxi ranks

Introduction

Taxis are an important means of public transport particularly for people with mobility impairments. They are also important for the commercial viability of retail areas in London.

TfL is responsible for the regulation of taxis and private hire cars. The creation, modification, and revocation of taxi ranks within London are the responsibility of the TfL Public Carriage Office.

Design criteria

Taxi ranks are bays marked with 50mm wide yellow broken lines on the edge or centre of the carriageway surface and signed in accordance with the TSRGD. Only licensed taxis are permitted to stop in the areas bounded by the road markings.

Taxi ranks should be located close to transport interchanges and major attractions such as retail areas, sporting stadia or major commercial areas.

Consideration should be given to locating ranks where carriageway space can be given up without impeding traffic flows and take account of the needs of taxi passengers, particularly people with mobility impairments.

Good Practice

Ranks should be positioned with due regard to safety, so that passengers can board from or alight onto the footway from the nearside doors of a taxi.

To assist people with mobility impairment, a pedestrian crossing, dropped kerb or raised table should be located near to the taxi rank. Taxi ranks should be clearly signed and seating should be positioned nearby.

Signs showing telephone number(s) for calling taxis should be positioned close to ranks. These signs should be embossed to assist people with visual impairment.

Footways adjacent to taxi ranks should have an unobstructed width sufficient for wheelchairs to manoeuvre and to accommodate ramps (1650mm). The footway should be well lit.

References

Statutory Instruments:

- Traffic Signs Regulations and General Directions 2002

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Transport for London:

- Taxi Ranks at Major Interchanges: Best Practice Guidelines, 2003

Streetscape Guidance details:

- TfL/SG16

Seats

Introduction

Seating is required to provide resting places for pedestrians and to provide places where people can enjoy the view or interact socially.

Seats should be provided on key pedestrian routes to schools, transport interchanges, work places, social facilities and shops.

Design criteria

Seating should be designed to combine comfort, ease of maintenance and resistance to vandalism.

Design teams should provide arm rests on seats which assist less-mobile people and help to discourage anti-social behaviour. As illustrated in the palette of materials, arm rests may be omitted to allow better access for wheelchair users or parents with pushchairs.

Timber is preferred where people may sit for longer periods of time. Other materials may be used where vandalism is expected. Concealed ground fixings should be used. Timber should be compliant with GLA's responsible procurement policy.

Good practice

Seating should be located where it does not cause an obstruction and offers the user a view. Public spaces that are attractive and in sunlit positions are preferred.

Provision should be made at regular spacing (ideally 50m) along recognised pedestrian routes, especially those used by less-mobile people or where the street has a steep gradient.

Seating should be associated with bus stops and places where people wait, wherever possible. A continuous run of seating will add to people's enjoyment of the streetscape where high usage is anticipated and space allows

Seats facing into the footway should be set back from the kerb by at least 450mm and be out of vehicular sight lines. Consideration should be given to the position of the seat so that approaching people can be seen.

Seats should not be positioned where they may hinder access to adjacent property or be located directly underneath trees or other structures where bird droppings can be expected.

Seating should be located away from wind tunnels such as between tall buildings, which could make their use uncomfortable.

Where possible, two or more sections of seating should be provided in one area.

Seats can be damaged by skateboards. Locating seat backs against a wall will prevent the problem.

Authorisation

Seats may be provided by the local authority, subject to the approval of the highway authority.

References

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Greater London Authority:

- The GLA Group Responsible Procurement Policy

Transport for London:

- Making London a Walkable City – The Walking Plan for London, 2004

Streetscape Guidance:

- Palette of materials: Seats
- Technical guidance: street furniture

Streetscape Guidance details:

- TfL/SG15 and SG16

Bollards

Introduction

Bollards are used to physically separate pedestrians and vehicular space. Their use can discourage vehicles from entering pedestrian space and cycle tracks thus reducing the risk of pedestrian injury and preventing damage to footway surfaces, street furniture and structures.

Bollards have been over-used because they provide an 'easy' design solution. Where this has occurred they clutter the streetscape and can create an unnecessary hazard for people with mobility and visual impairments.

Bollards on the TLRN are particularly associated with the Red Route improvement initiative and side road entry treatments. They are sometimes used to define space and guide vehicles.

Design criteria

Where the only effective means to prevent vehicles mounting the footway is identified as being to use bollards they should be of a minimum height of 1000mm.

Care is needed if the design team recommends siting bollards in grassed areas to prevent creating a maintenance problem when cutting grass around the base of bollards.

Where bollards are provided they should be finished in a manner that is consistent with the rest of the street furniture, as recommended by this Guidance. The use of visibility bands may be required in areas of heavy pedestrian activity.

If bollards are likely to be hit by vehicles, the method of ground fixing should be considered to minimise damage to the surrounding footway surfaces and to allow easy replacement.

Bollards which have a security function must be fixed and specified in accordance with Publicly Available Specification (PAS) 68 and 69.

Location Criteria

Bollards should be placed 450mm from the kerb face. On those occasions when bollards are to be used to prevent vehicles driving along footways or prevent access, they should be placed at 1500mm centres across the width of the footway surface. The use of reflective bands will usually be necessary in this situation.

Bollards should be placed at 3000m centres when used to stop vehicles mounting the edge of the footway.

Good practice

Bollards should only be used where there is no alternative means of keeping vehicles from the footway. Design teams should consider the potential to relocate other essential items of street furniture, to replace the need for a bollard where it is safe to do so, and to consider kerbs and 'tipped corners' as an option.

Design teams should question whether existing bollards are still needed, subject to safety advice.

A number of traditional historic bollards exist on the TLRN, some of which are listed; these should be retained. Formal risk assessments may be required for the provision and retention of bollards.

If vehicles are known to mount the edge of the footway only on rare occasions, design teams should consider local strengthening of the footway along bands 1000mm from the kerb rather than introducing bollards. Expert safety advice should be sought.

If motorists are known to regularly mount the edge of a footway along a length of kerb line the use of a high kerb face may also be considered as an alternative to using a line of bollards.
A kerb face of 125mm–140mm will usually stop motorists mounting the edge of the footway when stopping.

Where alternative design and management solutions such as those described above can be implemented, existing bollards should be removed.

Slender bollards may be better suited to the proportions of the streetscape in narrow streets.

In special areas, the design team must ensure that bollards are well-designed and functional and are appropriate for the local area.

Under no circumstances should bollards be linked with chain or rope.

Reference

Legislation:

- The Disability and Discrimination Acts 1995 and 2005.

British Standards:

- Publicly Available Specification (PAS) 68 and 69

Streetscape Guidance:

- Palette of materials: Bollards

Streetscape Guidance details:

- TfL/SG06, SG13, and SG15

Pedestrian guardrails

Introduction

Pedestrian guardrails provide a means of discouraging pedestrians from entering the carriageway and channelling them to a safer section of road where they can cross.

Notwithstanding their prime safety functions, pedestrian guardrails can introduce the feeling of severance along sections of the TLRN.

In addition, they may reinforce the feeling that these sections of the network supports high speed traffic and therefore discourage pedestrian access.

Pedestrian guardrails have been installed for a number of incorrect reasons in the past, and they can significantly detract from the quality of the streetscape. Their continued use should be based solely on maintaining or improving safety.

Design teams should question the need for guardrails and remove any that cannot be shown to be needed to maintain pedestrian safety, subject to safety and legal advice.

Design criteria

For guardrails to aid pedestrian safety, the height should be at least 1100mm, preferably 1200mm high and be designed to permit clear sight of people or objects behind the railing when observed from an acute angle.

The guard railing should have the same finish as the other street furniture on the TLRN in the locality, as required by this Guidance.

A wide range of different styles of guardrail currently exists across the TLRN. TfL intends to limit this range to simple, modern designs. If bespoke designs or reproductions of historic designs are agreed for special areas, they must meet safety standards and be approved by the Streetscape Review Group.

For maintenance purposes, guard railing should be made of replaceable components, not welded together.

Good practice

Design teams must critically review the necessity of existing and proposed guard railing.

TfL has an internal procedure relating to the assessment of the use of guardrails.

Where guardrail is provided it should be set back 450mm from the kerb face. Where existing guard railing is damaged it should be replaced with matching panels unless the design team consider that a complete section should be replaced to improve the streetscape, in accordance with the palette of materials.

Consideration should be given to setting guardrails in hard standing if used on grass verges to facilitate grass cutting.

Where long lengths of continuous guard railing have been provided, it implies that inadequate crossing points exist. Design teams should consider if additional or relocated crossings on pedestrian desire lines are required and if they are a practical solution.

Reference

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges, Volume 2, Section 2, Part 8, TD 19/06: Requirements for Road Restraint Systems
- Design Manual for Roads and Bridges, Volume 6, Section 3, TA 57/87: Roadside Features

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

British Standards:

- BS7818: Specification for pedestrian restraint systems in metal

Streetscape Guidance details:

- TfL/SG03, SG07, SG15 and SG27

Safety fences and barriers

Introduction

Safety fences and barriers are installed to minimise injury by containing a vehicle on the carriageway to prevent collisions with oncoming vehicles or solid objects.

Design criteria

Whilst safety should be the major factor in deciding whether or not to introduce them, safety fences and barriers can have a detrimental visual impact on the streetscape.

Many types of safety fences and barriers have been devised to provide containment of vehicles. These include tensioned and un-tensioned corrugated beam, open box beam and wire rope fences and concrete safety barriers.

Only those having type approval may be used in the UK and have to meet various performance criteria. Expert advice must be sought with regard to the type and placement of safety fences and barriers.

Good practice

The use of safety fences and barriers should be kept to a minimum and used only where a credible risk of vehicle-pedestrian or vehicle-vehicle collision can be identified.

When considering the use of safety fences and barriers, consideration should be given to maintaining inter-visibility between motorists and pedestrians.

Adequate space should be provided for pedestrians and cyclists at junctions and crossing points.

Wire rope safety fences are less visually intrusive than other forms of safety fence and may be a suitable alternative.

The placement of safety fences on grassed verges on higher speed roads should take account of the need to cut vegetation around the fence supports. It may be appropriate to incorporate a hard surfaced strip to remove the need to cut round the fence supports.

Safety fences and barriers are usually galvanised and should not be finished in black.

References

Department for Transport, Highways Agency:

- Design Manual for Roads and Bridges: Volume 2, Section 2, Part 4, TD19/85: Safety Fences and Barriers
- Manual of Contract Documents for Highway Works, Volume 1, Series 400: Road Restraint Systems (Vehicle and Pedestrian)

British Standards:

- BS 7669-3: Guide to the installation, inspection and repair of safety fences

Salt bins

Introduction

It is important to take into account that provision of salt bins may be required along certain sections of the TLRN.

Salt bins are usually plastic containers holding or salt for treating roads and footways during the winter months.

Design criteria

Salt bins should be located at places that could become hazardous during icy conditions such as slopes, bends, steps and close to sheltered housing.

They should be located where their use will be convenient without obstructing or causing damage to property or to street trees and other vegetation by salt leakage. They should be weatherproof, fireproof, robust, durable and vandal resistant. Appropriate design can enable them to be removed and stacked when empty.

Good practice

The provision and use of salt bins should be for the sole use of clearing the surrounding footway or public steps.

Bins should be replenished throughout the winter and consideration given to their removal and storage once the danger of ice has receded. Bins that are left out all year may become used for the disposal of rubbish and salt leakage can cause damage.

While the standard colour of salt bins is yellow, other colours should be considered to ensure coordination with other street furniture on the TLRN in the locality.

Consideration should be given to using high quality bins and screening in or near special or historic areas.

Environmental monitoring equipment

Introduction

TfL and other authorities monitor environmental quality and collect data associated with the emissions from road traffic. In particular, air quality monitoring equipment is placed in selected locations, usually at roadside locations.

Design criteria

Different methods are used to collect data. The equipment being utilised determines the size and type of the housing unit. Planning consent may be required from the local planning authority.

Good practice

While the position of the equipment will generally be determined by monitoring and data collection requirements, consideration should be given to access and energy requirements.

Care should be taken to avoid obstructing footways or sight lines.

To minimise the impact on the streetscape, a simple, clean, modern design of housing unit is preferred. Wherever possible, it should be integrated into another built structure or facility.

The same anti-graffiti and fly-posting techniques for control cabinets should be applied.

Special consideration should be given to the location if the equipment has to be in a special or heritage area.

Public art

Introduction

The use of public art on the TLRN network may be considered in an area where a special and decorative design feature or landmark will help to define a particular place or strongly enhance people's daily experience.

The best public art may not be a single object but could be an element repeated across an area, or simply an adjustment to the 'standard'.

Public art is usually located in special areas to create easily-identified visual recognition points for pedestrians.

Public art can help to reinforce spaces, not only in public areas where people gather, such as transport interchanges, but also as landmarks on traffic roundabouts.

TfL will only support work to the highest standard in a small number of well chosen locations. Design teams or external promoters of public art should forward their recommendations to the Streetscape Review Group.

Good practice

Public art should always be designed to complement its location. Design teams should ensure that public art meets streetscape criteria and seek approval from the Streetscape Review Group.

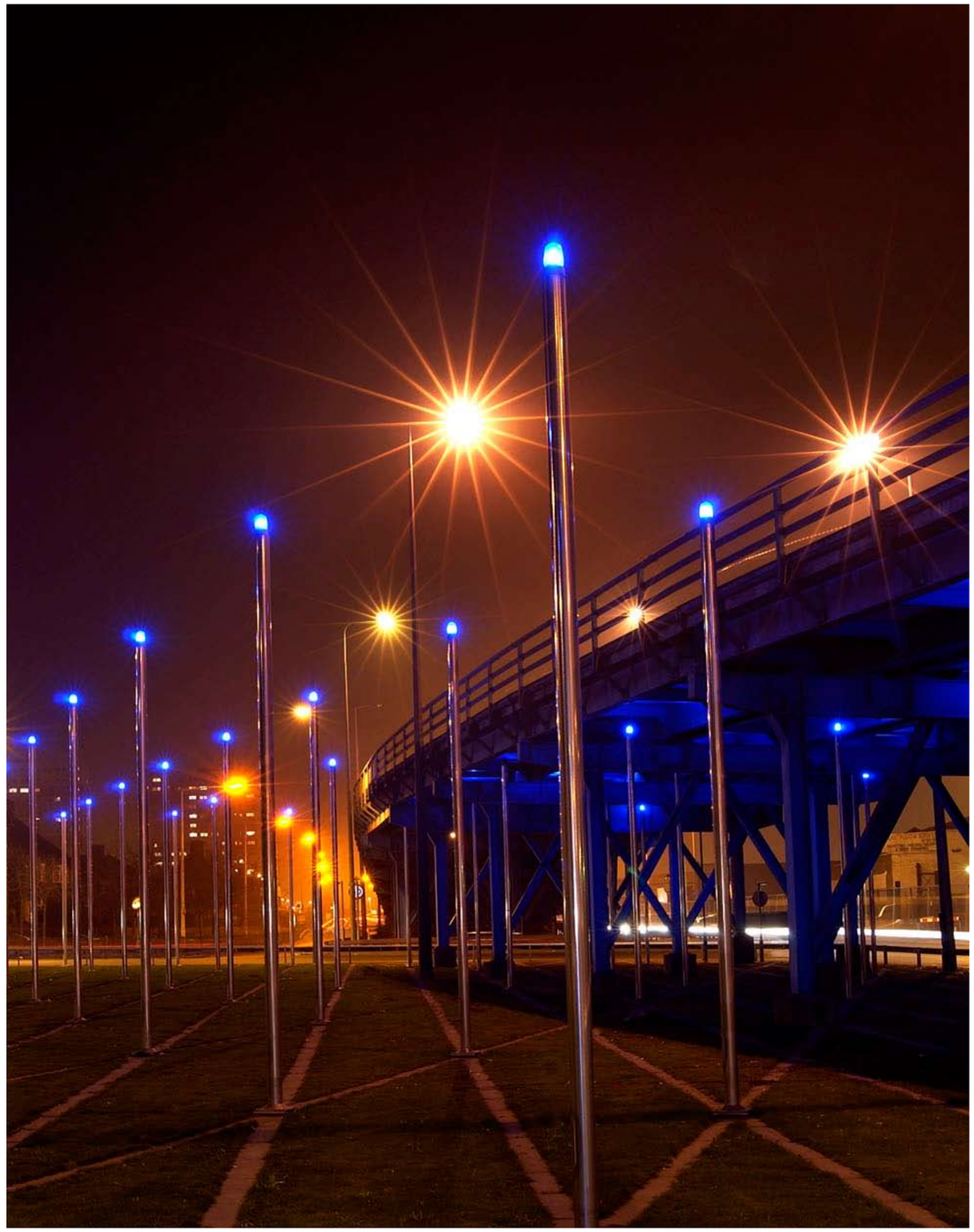
In some cases, it may be appropriate to involve the local community in judging a design competition through the local authority's public arts co-ordinator.

Planning consent may be required from the local planning authority.

The maintenance and management of public art must be taken into account as part of the design process.

Design teams wishing to commission art for the TLRN should liaise with Design for London and one of the following:

- Local authority arts coordinator
- Platform for Art
- Art in the Open



Holding Pattern
by Graham Ellard and Stephen Johnstone
Photograph by Douglas Atfield

9 Technical guidance: street furniture by third parties

Street name plates

Introduction

The effective design and installation of street name plates is essential for the efficient functioning of the postal and emergency services as well as for the convenience and safety of the general public.

Local authorities are the street naming authority and are responsible for the naming, erection and maintenance of street name plates.

Design criteria

Street name plates are commonly viewed from an angle and therefore it is important that legible lettering is used.

Most local authorities have a particular style they adopt for the majority of streets in their area. The following guidance is provided in order to achieve the required standard.

Street name plates should achieve a good contrast which is usually achieved with black lettering on a white background and coloured postcode and borough name.

The minimum spacing between words should be approximately 50% of the “x” height of the lettering. Top and bottom borders should be approximately 40% of the “x” height. Initial capital letters and lower case lettering should be used for the majority of street name plates. A minimum “x” height of 75mm and a maximum of 90mm are recommended.

The postal area and direction of house numbers may also be included to assist visitors to navigate areas. If district names are to be included on the street name plate, reduced lettering heights should be used.

The preferred material is box-formed vitreous enamel.

Good practice

If it is proposed to move or erect street name plates, the relevant local authority should be consulted.

Street name plates with historic interest (eg, pre-1964 Metropolitan Boroughs) should be preserved wherever possible. It may be possible to leave these in place and provide new street name plates which comply with the design criteria.

Street name plates should be fixed as near as possible to street corners so as to be easily readable by street users.

Street name plates should be mounted so that the lower edge is approximately 1m above the footway surface at sites where they are unlikely to be obscured by pedestrians or vehicles and at approximately 2500mm otherwise.

To reduce street clutter, plates should be mounted on walls or other boundary structures at the back edge of the footway wherever possible. In certain areas it may be appropriate to paint the sign directly on the wall.

When mounted on buildings and structures adjacent to the highway, they should not be mounted at heights in excess of 3600mm. Street name plates should not be mounted on tall poles which add to clutter.

Street names need to be legible throughout the day and night. Where possible, name plates should be fixed so that they will be illuminated by street lighting and free from obstruction by the growth of vegetation.

If it is proposed to rename any street, as part of major streetscape improvement projects, the old name should be crossed out but be clearly legible and should remain for 1-2 years before removal.

Reference

Joint Mobility Unit:

- Sign Design Guide, 2000

London Transport Users Committee:

- Where am I? Street name signs in London, 2003

Information signage

Introduction

Information signs on streets are usually supplied by local authorities to help people locate local facilities and amenities. It is important to make information as simple and easily understood as possible for all users.

The needs of people with visual impairments are particularly important. Some boards also have an audio facility for people with hearing impairments.

Design criteria

Information boards must be in accordance with TSRGD, Schedule 4.

The size of the letters used on information boards should be related to the distance from which the sign will usually be read. As a general rule, it is suggested that the letter height should be at least 1% of the distance at which the message will usually be read, subject to a minimum height of 22mm.

Symbols can have the advantage of simplicity and greater clarity but should not be used unless it is known that the readers will understand them.

The characters on information boards should contrast with the background. Apart from signs that are internally lit, dark text on a light background is preferable.

Information boards should have a matt finish and should be well and evenly lit with uniform lighting over the surface of between 100 and 300 lux.

Information boards can be used on the public highway at bus stands or interchange points between routes, subway entrances or other transport interchanges.

The optimum viewing angles for information boards mounted on walls or other vertical surfaces are ° 30 degrees in the vertical plan and up to 20 degrees either side of a line perpendicular to the sign in the horizontal plane. Wall mounted information boards with timetables and maps should be centred approximately 1400mm from the footway surface and should be placed such that pedestrians will not walk in to the sign face or its edges.

It is expected that the number of information boards on the TLRN will be restricted to areas of very high pedestrian activity.

Good practice

Like signs, pedestrian information boards should be located to minimise visual and physical intrusion into the streetscape. This can be achieved by placing information boards, where practicable, on frontages of buildings, or at the back of the footway parallel to the building facade.

Information boards should encompass all the facilities within the area, particularly any services or facilities for people with a disability (accessible toilets, accessible buses, shop mobility services, etc). Given the limited distances that some ambulant disabled people can manage, it is essential to say how far it is to each facility mentioned.

References

Statutory Instruments:

- Traffic Signs Regulations and General Directions 2002

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002

Joint Mobility Unit:

- Sign Design Guide, 2000

Litter bins

Introduction

The provision of litter bins is especially relevant where large numbers of people congregate.

Litter bins are usually provided by the local authority, subject to the approval of the highway authority.

The provision of bins must take account the street cleansing regime as they must be emptied and maintained on a regular basis by the local authority as required by the Environmental Protection Act.

Design criteria

Bins should be robust, functional and of a simple design.

Design teams will need to liaise with the relevant local authority to ensure that the design allows the local authority to empty the bins.

In high security areas, the use of blast-resistant litter bins and litter bins with concealed ground fixing that allow the removal of bins will be required. Advice should be sought from TfL's Transport Community Safety Managers within the Community Safety, Enforcement and Policing directorate.

For advice on blast-resistant products contact the Home Office Scientific Development Branch (HOSDB). Information Service on 01727816400 or email hosdb@homeoffice.gsi.gov.uk

The capacity of the bin needs to take account of the intensity of use to avoid spillage of contents onto surrounding footways. The use of integrated cigarette disposal units may be considered.

The finish should be consistent with other street furniture on the TLRN within a given locality.

Where graffiti and fly-posting are a problem, chemical-resistant low adhesion anti-graffiti and anti-fly posting finish should be applied.

Good practice

Litter bins must only be provided where they do not cause an obstruction on the footway. Litter bins design should respect special areas and conservation areas.

Care should be taken to avoid placing litter bins where the footway width would be reduced to below 1.8m wide.

As with other items of street furniture, they should be set back from kerbs by at least 450mm and should not obstruct visibility. Access to adjacent property should not be obstructed.

Ease of access for emptying must be taken into consideration.

Reference

British Standards:

- Publicly Available Specification (PAS) 68 and 69, 2005

Streetscape Guidance:

- Palette of materials: Bins

Streetscape Guidance details:

- TfL/SG15 and SG16.

Recycling bins

Introduction

The provision of recycling bins is the responsibility of the local authority. Their function is to encourage residents to recycle household waste, not to provide disposal facilities for commercial or retail establishments. The demand for and provision of recycling bins are likely to increase in line with sustainability policies, Agenda 21 and public awareness.

Design criteria

The functional design of each particular bin is generally related to the type of material being recycled. The bins should be fireproof, robust and contain explanatory graphics.

Access must be provided for collection and emptying and not prevent access to adjoining properties.

Bins should respect the streetscape and should generally not be placed in special areas or where they detract from listed buildings or heritage features.

Good practice

Only in exceptional circumstances should recycling bins be placed on the TLRN. Where this is unavoidable, representatives from the local authority and TfL must agree a suitable location.

Recycling bins should be located where safe access can be ensured. They should be positioned where adequate and safe access and parking for collection and delivery vehicles can be provided. Care is required to ensure that traffic flows are not impeded by collection vehicles.

Recycling bins should not be installed where the footway width would be reduced to less 3000mm.

The structural strength of the footway and the surface finishing materials needs to be considered with the aim of preventing cracked and broken paving flags, which could be subject to heavy loading by collection vehicles.

Concrete based materials are prone to heavy staining from drink residues around bottle banks. Bins should therefore be leak-proof.

Trade refuse bins

Introduction

The provision of bins for trade refuse is the responsibility of either the local authority or private contractors. Their function is to ensure the safe storage of larger quantities of waste materials from commercial and retail establishments. 'Eurobins' or 'continentals' are the general name for the large movable containers.

Design criteria

Trade refuse bins should be fire-resistant and robust and have wheels to manoeuvre them to collection vehicles and have a facility to enable them to be lifted using modern lifting equipment. They should contain explanatory graphics and be located where access to adjacent properties will not be hindered.

The trade refuse bins should be of uniform style and colour where possible and be co-ordinated with other street furniture. Consideration should be given to using higher quality bins and screening if they have to be located in or near special or historic areas.

In high security areas, the use of lockable or sealed bins will be required. Advice should be sought from TfL's Transport Community Safety Managers within the Community Safety, Enforcement and Policing directorate.

Good practice

Trade refuse bins should preferably be located away from the TLRN and where safe access can be ensured.

They should be positioned where parking for collection and delivery vehicles can be provided and traffic flows are not impeded by collection vehicles. Visibility sight lines must be maintained. They should not be placed where the footway width would be reduced to below 3000mm.

Regular emptying and maintenance are required to prevent collection of 'overflow' material collecting adjacent to bins.

Integral discreet graphics are preferred to stick-on labels which tend to peel off.

To prevent cracked and broken paving flags, which could be subject to heavy loading by collection vehicles, the structural strength of the footway and potential damage to the surface materials must be considered.

Responsibility

Installation is the responsibility of the local authority or a private contractor.

Authorisation

A licence from the local authority may be required.

Utility cabinets

Introduction

Utility cabinets and the equipment of utility companies are having an increasing visual impact on the streetscape and can create obstructions on the footway.

These cabinets are generally located above ground for ease of maintenance and reduction in the cost of installation.

Good practice

Low-profile clear matt anti-graffiti finishes should be applied to facilitate the removal of graffiti and fly-posters.

Doors should open so that utility operatives face oncoming traffic.

Cabinets should be finished in a colour co-ordinated with the colour (black or grey) and finish of surrounding street furniture on the TLRN, as required by this Guidance.

Utility companies should be encouraged to use cabinets of a consistent and simple contemporary design.

When utility companies seek to introduce a new cabinet on the TLRN, a minimum clear footway width of 2000mm must be maintained.

Cabinets must not obstruct loading bays, service access points and crossovers.

Cabinets must be positioned out of sightlines away from loading bays, service access points and crossovers. Cabinets should preferably be located at the back of the footway.

If a utility cabinet is to be installed adjacent to the kerb, a clear distance of 450mm must be maintained from the kerb face.

If utility cabinets are to be sited within a planted or grassed area to reduce its visual intrusion, 500mm wide hard surface must be provided around the cabinet to allow access and to facilitate maintenance of shrubs and grass.

Utility cabinets should be placed away from windows or walls where they could assist unlawful entry into properties.

Telephone boxes

Introduction

Telephone boxes are a very recognisable feature of the streetscape with a mixture of traditional and modern corporate designs. Telephone boxes are also being incorporated into some bus shelter designs.

Design criteria

Telephone boxes should not be installed where the footway is less than 2000mm wide.

They should be located away from loading bays, service access points and crossovers and preferably located in recesses at the back of footways. The doors should not open into the path of pedestrians.

If located close to the kerb, the box should be no less than 450mm from the kerb face.

Good practice

Boxes should be positioned to ensure that there is sufficient space to allow mechanised cleaning.

The Telecommunications (services for disabled persons) Regulations 2000 require that 75% of all telephone boxes are accessible by reasonable means by wheelchair users. When telephone companies seek to place a telephone box on the TLRN, they should be reminded of this requirement. Further advice is available from the Advisory Committee on Telecommunications for Disabled and Elderly People.

Design teams should ensure that there is sufficient space around telephone boxes (1850 x 2100mm) for wheelchair access.

Each telecommunication operator has their own design style but they should be encouraged to co-ordinate the box with other street furniture in the vicinity and to respect the surrounding area.

Responsibility

Telephone boxes are the responsibility of the telecommunication operators.

Authorisation

Telecommunication operators have to seek determination from the relevant local planning authority whether prior approval is required for siting and appearance.

Telecommunication operators with a licence under Section 7 of the Telecommunications Act 1984 may install public call boxes on the public highway.

The Highways Act 1980 provides that the local highway authority has to give consent for objects on the highway.

Listed building consent is required where there are proposals to alter or remove a listed telephone box, or those set in or adjacent to a listed building. Refer to Planning (Listed Buildings and Conservation Areas) Act 1990.

Parking control equipment

Introduction

Throughout many parts of London paid parking (metered, residents' permit or pay and display) controls exist. There is, however, very little paid parking on the TLRN.

Paid parking is excluded from the Red Route controls and is enforced by the local authority.

More recently, the need to control commuter parking adjacent to the central London congestion charging zone has seen an increase in controlled parking zones.

Residents of the area apply to the local authority for a permit and pay an administration charge for a parking permit. Some of these zones extend onto the TLRN and are enforced by TfL.

Design criteria

A range of differing styles and design of paid parking equipment is produced by manufacturers. Meters and pay and display machines are produced in a range of colours, size and finish. These should match that of the rest of the street furniture when located on the TLRN.

Payment equipment should be located at positions convenient for motorists to use.

Parking schemes also require the introduction of signing and road markings to advise motorists of the nature and times of operation of the scheme.

Good practice

Pay and display equipment is preferred to rows of parking meters on the TLRN. This will require the agreement of the relevant Local Authority. The number of signs used to advise motorists of the time and nature of the controls should be kept to the permitted minimum.

Within controlled parking zones waiting and loading signs only need to be erected where yellow line controls differ from the hours of operation of the zone. Parking bays must be signed to indicate who may use them and for what periods.

Signs indicating the hours of operation of yellow line controls and parking bays should be located at the back of the footway or fixed to other items of existing street furniture (eg, lamp columns) to minimise clutter. Signs can also be placed on adjacent building, subject to the necessary consents. The size of sign used should also be the minimum permitted by the TSRGD.

Where Blue Badge holders are required to pay for parking this must be clearly signed adjacent to the bays.

Special consideration is required in the mounting height of payment or ticketing equipment to ensure that it is accessible to wheelchair users. They must be no less than 750mm and no more than 1200mm above the footway.

Any message displays or instructions should be centred approximately 1500mm above the footway.

Instructions should be clearly set out in 16 point lettering with a mixture of cases and unambiguous illustrations.

Push buttons should be 20mm in diameter and slightly raised from the surface of the payment machine.

There should be sufficient space (1850mm x 2100mm) to manoeuvre a wheelchair to the machine.

Signs showing tariffs should not be visually dominant.

Reference

Statutory Instruments:

- Traffic Signal Regulations and General Directions 2002

Post and pouch boxes

Introduction

The post box is a very recognisable feature within the streetscape and some heritage designs are listed. Free-standing and linked pouch boxes, however, contribute to street clutter and should be removed from the streetscape where possible.

Design criteria

The integration of pouch box within post boxes should be encouraged. Post boxes should not be installed where the footway is less than 2000mm wide.

They should preferably be placed at back edge of footway next to buildings or blank walls and not obstruct visibility sight lines.

Good practice

Post boxes should be placed on a hard surface to allow for easy emptying.

There is a national rolling refurbishment programme removing linked post pouches. When streetscape improvement projects are being undertaken, the Royal Mail should be contacted with a view to removing any linked post pouches within the scheme.

Where pouch boxes are to be located on the TLRN, they should be at the back of footway in recesses, ensuring that there is sufficient space to allow cleaning. Particular care will be required if they are to be sited in special areas.

Responsibility

Post and pouch boxes are the responsibility of the Royal Mail.

Authorisation

Planning consent is not normally required for a post box or self-service stamp machine. However, consent is required for pouch boxes.

Consent must be obtained from the highway authority for installation of post and pouch boxes on the public highway.

Listed building consent is required where there are proposals to alter or remove a listed post box, or those set in or adjacent to a listed building. Refer to Planning (Listed Buildings and Conservation Areas) Act 1990.

Smoke vents

Introduction

Smoke vents allow the fire brigade to vent smoke from basements by breaking the panels. These are generally located on land belonging to the building they serve. There may be circumstances in which vents occur in the adopted highway, usually by grant of an undersailing licence.

Good practice

Smoke vents should be slip resistant and sufficiently robust to meet appropriate loadings, as well as performing their fire safety function.

Responsibility

Where smoke vents are within the adopted highway, footway maintenance lies with the highway authority. Responsibility for repair of the smoke vent lies with the owner.

Pavement cafés

Introduction

Pavement cafés on the TLRN are usually licensed by the relevant local authority who grant a highways amenity licence in accordance with set criteria for the purposes of eating and drinking or selling of goods.

The Local Authority can also grant licences for various street activities or street trading in order to control the type and style of activity.

Good practice

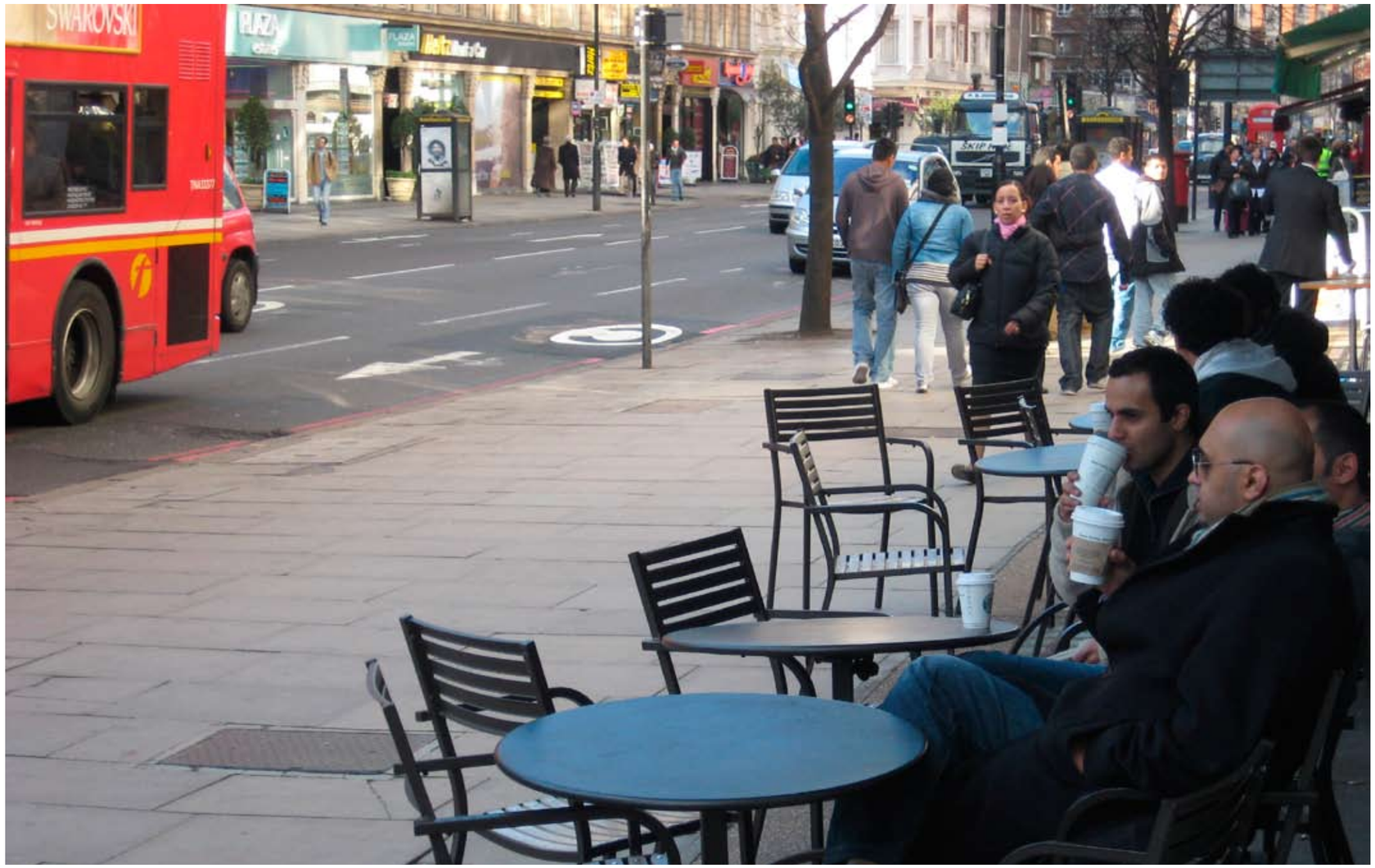
Pedestrian movement must be taken into consideration, allowing clearance for access and emergencies.

Areas can be demarcated by a variety of means. The most common and visually acceptable is the use of metal studs.

Reference

Department for Transport:

- Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure, 2002



10 Maintenance and management

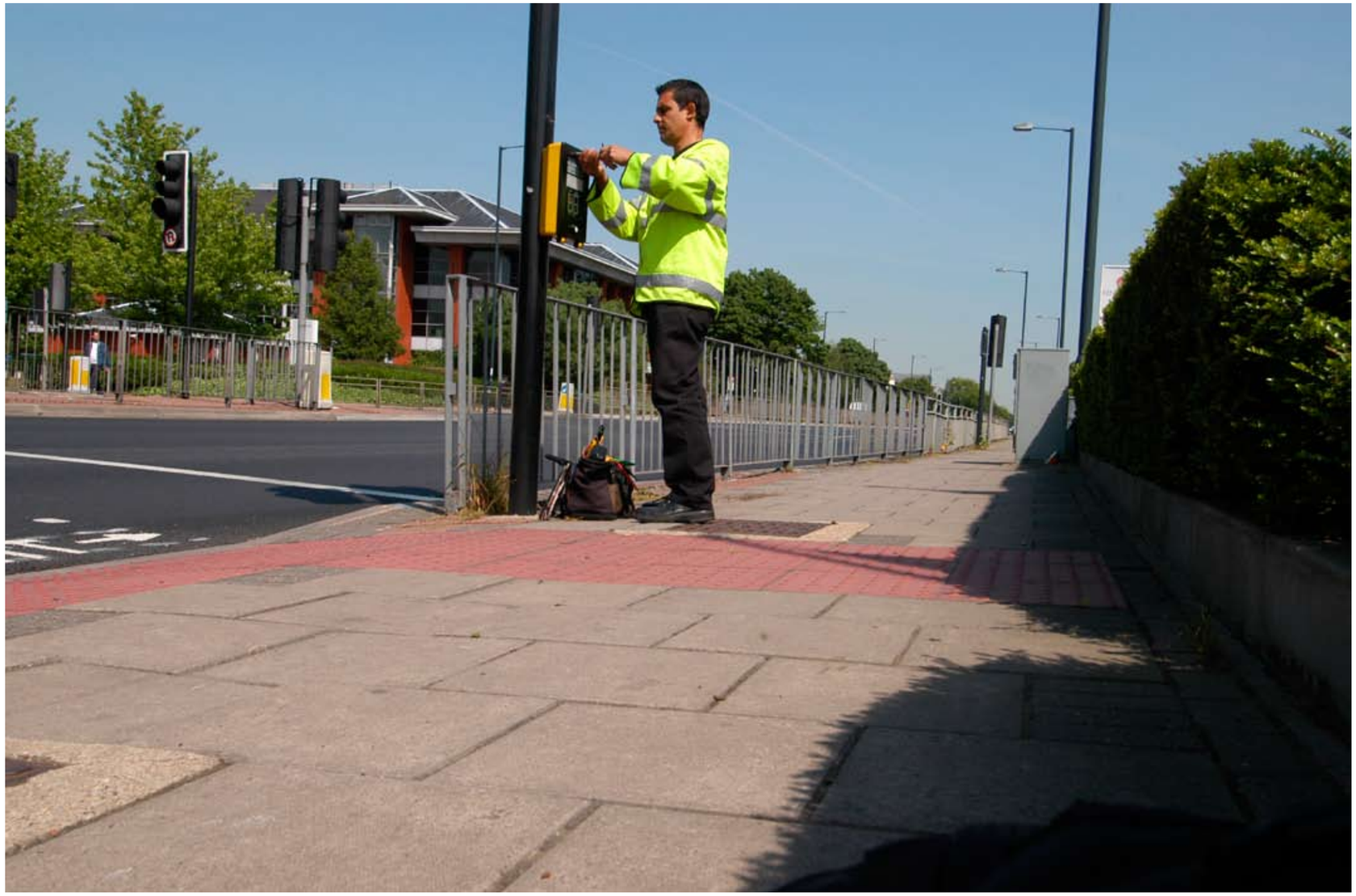
10 Maintenance and management

Introduction

Correct and timely maintenance is essential to ensure that excellent streetscape design, materials and construction are viewed and used as intended by the designer, and to ensure that they meet safety, serviceability and sustainability requirements.

Like-for-like replacement programmes will not achieve the world's best-managed streets, unless they are already world-class. TfL requires that the palette of materials is used on the TLRN for projects and programmes of all sizes unless TfL's Streetscape review group approve alternative materials in the case of Special Areas.

The replacement of small quantities of surface materials or street furniture to correct a defect requires careful consideration. In most cases, maintenance teams should adhere to the palette of materials unless there are valid reasons for not doing so and these should be referred to the Streetscape review group.



Transport for London responsibilities

TfL was established as the highway and traffic authority for London's strategic road network in 2000.

The Transport for London Road Network (TLRN) is defined in the GLA Roads Designation Order 1999.

TfL has a specific responsibility under the Highways Act to ensure the TLRN is maintained in a safe condition.

TfL has appointed highway maintenance and works contractors to manage the TLRN and implement maintenance and small-scale improvement works.

TfL routine maintenance works also need to be co-ordinated with the principles of good practice set out in this guidance.

Capital maintenance works may occur on a cycle of more than 20 years. It is important that these are recognised as long-term investments in the streetscape of the TLRN.

Simple like-for-like replacement programmes will not achieve the world's best managed streets.

Local authority responsibilities

Responsibility for highway cleansing services on the TLRN lies with the local authorities with the exception of the A13 DBFO contract. The appearance of the highway is therefore subject to the ability of a local authority to carry out this function but it is recognised that litter can form an eyesore even if the street is swept daily in some situations.

The provision of litter bins supported by a regular emptying regime will assist in reducing litter, but the budgetary restraints on some local authorities may result in less effective street sweeping or bin emptying than is desirable. The TfL highway inspectors should pinpoint these areas and liaise with the relevant local authority to agree a solution.

Problems exist on many parts of the network where pedestrian refuges, central islands or central reserves may not be effectively swept. A build-up of road dirt may also occur on the carriageway adjacent to these areas which may encourage weed growth. The TfL highway inspectors should note such problems and contact the local authority to ensure remedial action.

In some areas, TfL works with local authorities to facilitate cleansing by offering access and safer working through planned lane closures.

Utility company responsibilities

It is the responsibility of the utility companies to co-ordinate and plan any works necessary to their services. Formal notice is required under the New Road Street Works Act 1990. TfL is responsible for co-ordinating all road and street works on the TLRN.

TfL needs to respond to the utility companies to ensure the correct function of the highway, and the protection of the streetscape in accordance with TfL's procedures.

Any work by utility companies must be reinstated to meet the specification of the original construction of both footways and carriageways in terms of materials and quality.

TfL highway inspectors also need to ensure that reinstatement and works are safe, that material storage does not cause damage (especially to street trees) and spoil is kept to a minimum.

In order to ensure quality reinstatements, a statutory code of practice has been developed and is known as the 'Specification for Reinstatement of Opening on the Highway' also known as the 'Reinstatement Code'.

The 'Reinstatement Code' has provisions to allow the street authority to supply a specialist material to the utility company to ensure a match with the surrounding area. If there are no stocks of the material, the highway authority may give the utility the name of a supplier of the specialist material so that reinstatement can be carried out.

New developments fronting onto the Network

Introduction

The TLRN is continually changing and adapting to the development that takes place along its boundary. Where a new development in the form of a new building or enterprise area is created, it may have a direct influence upon the character of the streetscape.

The may result in new vehicle access points which could alter the existing pedestrian and traffic movement.

New developments may also offer opportunities to improve the streetscape, including:

- New bus stops
- Cycle parking facilities
- Improved street lighting
- Upgraded footway materials
- Street furniture
- Street tree planting
- Improved crossing facilities
- Service access

Improved access to local public transport may need to be provided to those who use the new development.

Authorisation

In most circumstances, local planning authority planning consent is required for new developments.

Responsibility

Installation is usually the responsibility Transport for London.

Maintenance is the responsibility of Transport for London.

Chewing gum

Introduction

Chewing gum deposits occur along the public footway and roadway. They are more prevalent in areas where people congregate.

Chewing gum stops the natural weathering of Yorkstone and, once removed, washing is required to restore even colouration.

Control methods

High pressure washing is commonly used to remove gum, but can damage the pointing between flags. Manual scraping, steam cleaning and freezing are other methods used. Gum disposal boards have been trialled in London by ENCAMS (who administer Capital Standards) with some success although the boards detract from the quality of the streetscape.

The use of sealant to the footway could make chewing gum easier to remove. Expert arboricultural advice should be sought if a design team proposes to use sealant near street trees.

Fly-posting

Introduction

Fly-posting is the illegal display of advertising material on buildings and street furniture without the consent of the owner. Defaced street furniture on footways and other areas of public space are a common blight in London.

A further problem is the illegal placing of signs, usually with a legend, directing people to places of local business such as new shopping or business outlets.

Erection of signs on street furniture without the consent of the highway authority is illegal.

With increasing attention on the quality of life and the environment, greater emphasis is being placed on addressing the problems caused by these illegal posters and signs.

Control methods

Prosecution of offenders is usually difficult and can be expensive.

Removal by steam or water is often expensive, time consuming and can damage the item it was affixed to.

Products are available which make it more difficult to stick fly-posters on the treated surface and easier to remove them.

This may be in the form of anti-graffiti and fly-posting finish or film applied to a height of approximately 3m above the footway surface on such items as lamp columns and sign posts.

Low-profile clear matt anti-graffiti and fly-posting products have been successfully trialled by TfL and are recommended for this use. These finishes allow the fly-posters to be peeled off without damage to the street furniture.

Sign faces and street furniture to be located in areas subject to fly-posting can be treated with a film or finish at manufacture which serves the same purpose.

Very rough high-profile finishes are not acceptable for visual and safety reasons.

References

Legislation

- Highways Act 1980 (Section 132)
- Town and Country Planning Act 1990 (Sections 224 and 225)

Office of the Deputy Prime Minister:

- The Control of Fly-Posting: a Good Practice Guide, October 2000

Graffiti

Introduction

Graffiti tends to be concentrated in areas such as transport facilities, squares and parks, bridges, walls, monuments, statues or other architectural structures.

Graffiti media include paints applied by brushes or aerosols, felt-tip markers and the physical scratching of surfaces.

Control methods

The application of anti-graffiti and fly-poster finish (as described above) allows the easier removal of graffiti. Chemical removers, air abrasives and pressure washing systems are available.

Laser cleaning systems can be particularly effective when employed on historic buildings or monuments where the original masonry may be fragile.

The earlier graffiti is treated, the better the result will be. Before any graffiti is removed, specialised expertise is required to:

- Recognise the sensitivities of the historic masonry
- Identify the graffiti media involved
- Make speedy and informed judgements as to the impact and effectiveness of the proposed removal technique

The application of graffiti and fly poster barrier treatment is rarely recommended for historic buildings and monuments.

The London Local Authorities Act 2004 contains a wide range of powers for London local authorities. The Association of London Government have published Codes of Practice on graffiti removal.

Reference

Association of London Government:

- Graffiti Removal: Code of Practice, 2005

Pigeons

Introduction

Pigeons thrive in urban areas. Their droppings have a destructive effect as their acidity can erode the surface of stonework. Gutters and drain pipes may become blocked, leading to flooding and associated problems. Droppings on footways may cause a problem for pedestrians.

Control methods

Cleaning of statuary, washing of footways, ledges and sills is a very expensive method. The alternative to regular cleaning is to use nets, spikes or gels to deter the pigeons using highway structures as roosts.

Measures may be taken to encourage people not to feed pigeons and to use litterbins provided.

Responsibility

Once pigeon droppings are deposited on the footway, removal is the responsibility of the local authority.

If TfL owns highway structures used as roosts by pigeons, TfL is responsible for introducing measures to prevent their use.

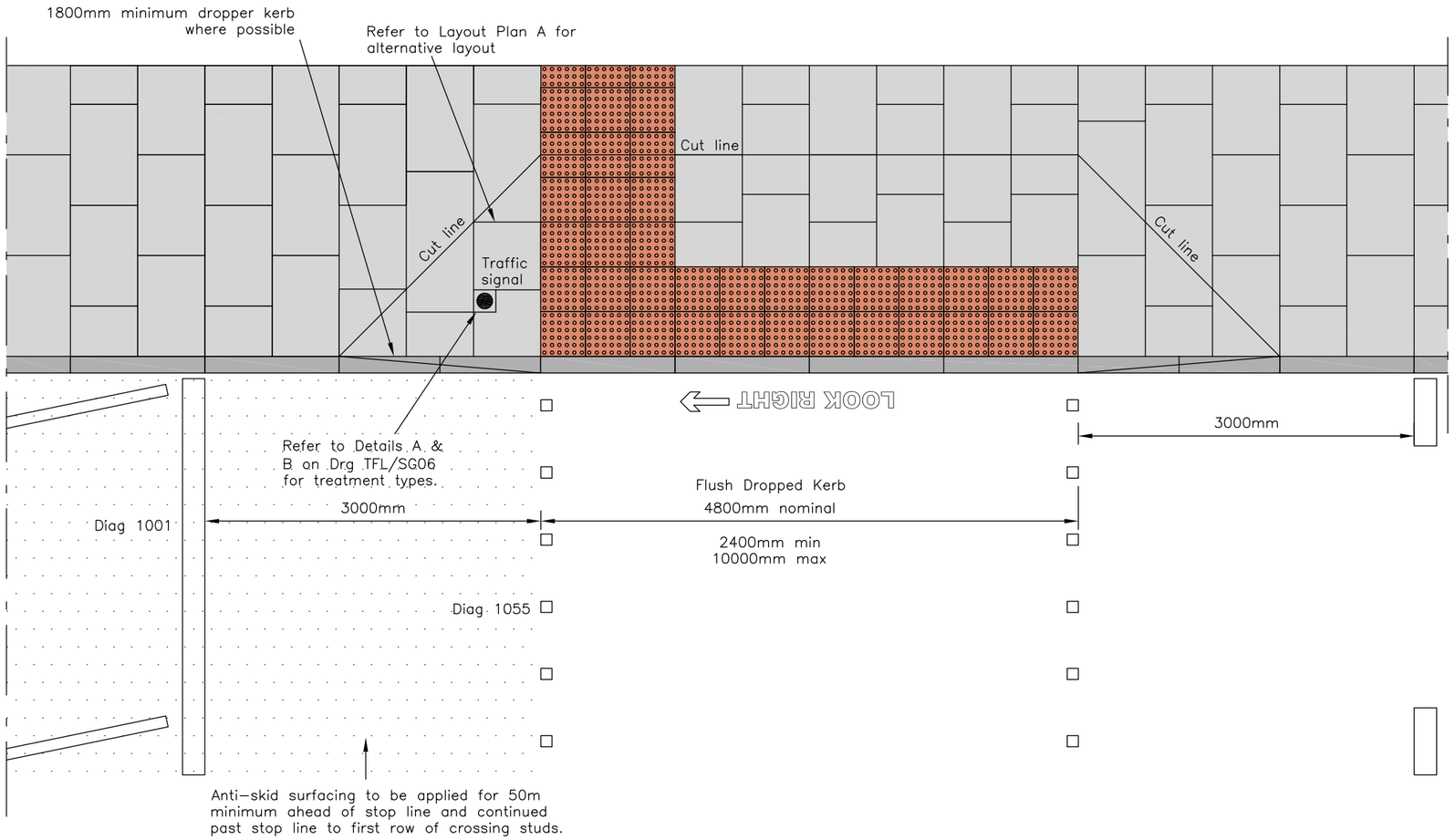
The London Local Authorities Act 2004 contains a wide range of powers for London local authorities. The Association of London Government have published Codes of Practice on prevention of nuisance from birds.

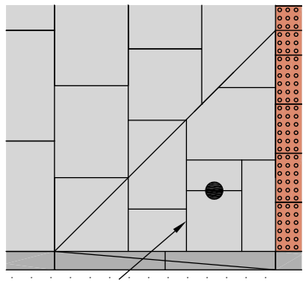
Reference

Association of London Government:

- Prevention of Nuisance from Birds: Code of Practice, 2005

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.





Layout Plan A
Scale 1:50

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard ps kerb height to be 125mm above carriageway.
6. Granite kerb dropped over approximately 1800mm to provide a flush fine picked silver grey kerb (0mm upstand) over crossing width.
7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
8. Signal poles must be positioned to provide a minimum lateral clearance of 450mm from all signal equipment to kerb face.
9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Red blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Anti-skid surfacing
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
5	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
4	19/05/08	MINOR AMENDMENTS	MDR	CNR
3	02/04/08	MINOR AMENDMENTS	MDR	CNR
2	7/11/07	MINOR AMENDMENTS	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Pelican Crossing

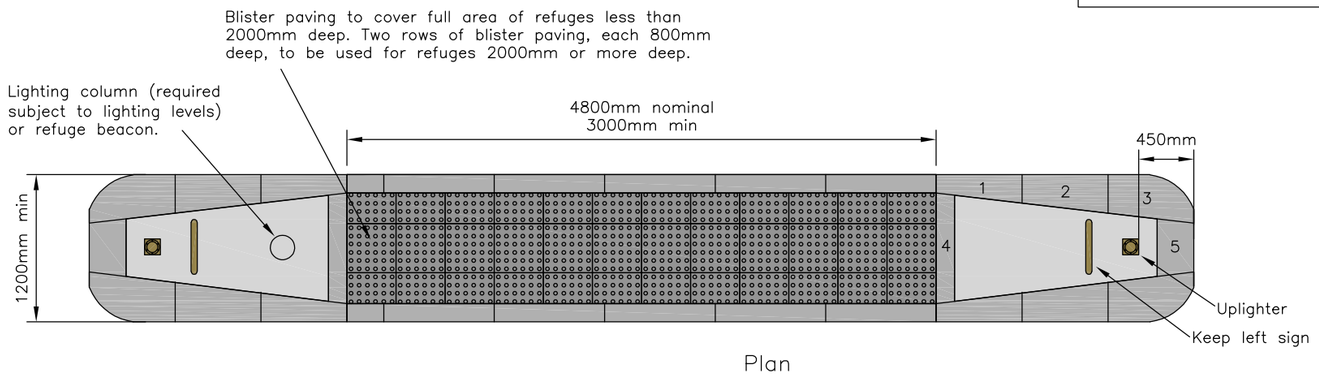
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:50	A3

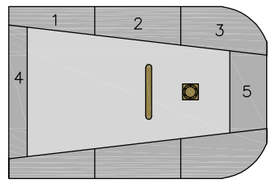
Drawing No.
TFL/SG01

Rev
5

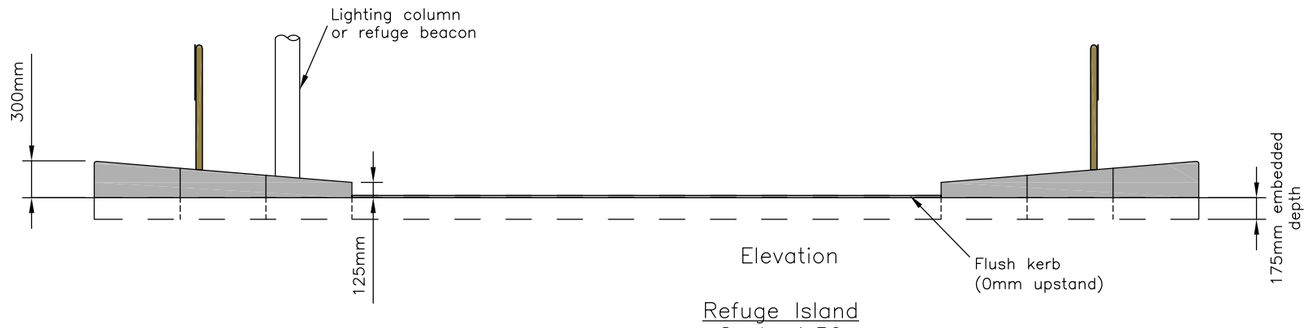
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan

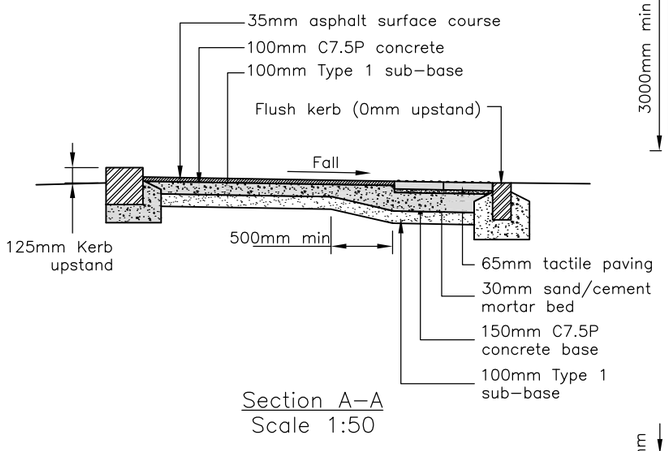


Refuge Plan

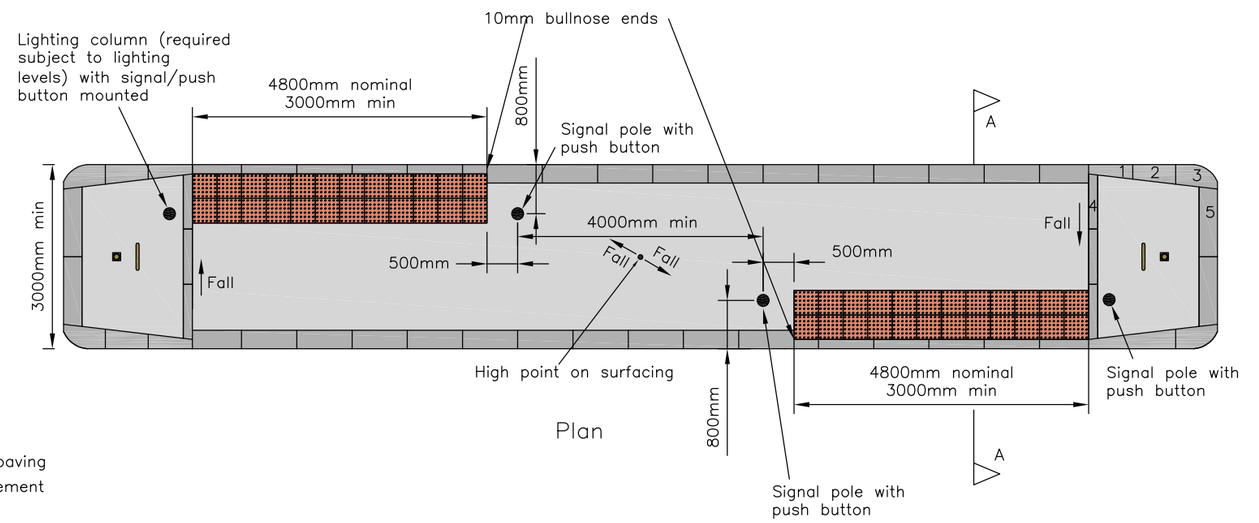


Elevation

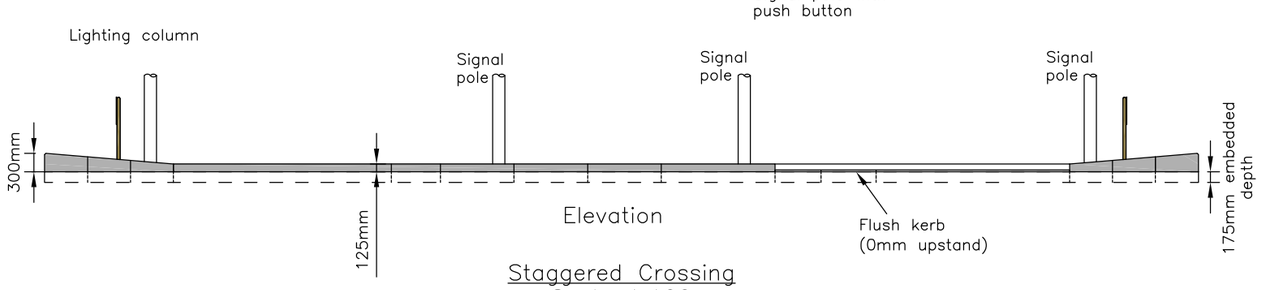
Refuge Island
Scale 1:50



Section A–A
Scale 1:50



Plan



Elevation

Staggered Crossing
Scale 1:100

Legend

- Red blister paving: concrete modular, 400x400x65mm, at controlled crossings
- Charcoal grey blister paving: concrete modular, 400x400x65mm, at uncontrolled crossings
- Asphalt surfacing
- 150mm Granite kerb, fine picked

Notes

1. Power supply with secondary connection for uplighter subject to agreement with local authority.
2. Granite kerbs to comply with BS 435
3. Precast kerbs to comply with BS 7263: part 1
4. Refer to Drg. TFL/SG28 for section details
5. Refer to Drg. TFL/SG20 for keep left sign and uplighter details
6. Attention is drawn to the possible trip hazard associated with the raised kerb surround to the Staggered Crossing Refuge Island. It is recommended that a comprehensive safety audit is undertaken before employing this option.
7. Signal poles must be positioned to provide a minimum lateral clearance of 450mm from all signal equipment to kerb face.

Rev.	Date	Description	Chkd.	App.
5	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	17/11/07	MINOR AMENDMENTS	GSV	LD
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	07/04/05	Client amendments	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project

Streetscape Guidance

Drawing Title

Pedestrian Refuge Islands without Guardrail

Drawing Status

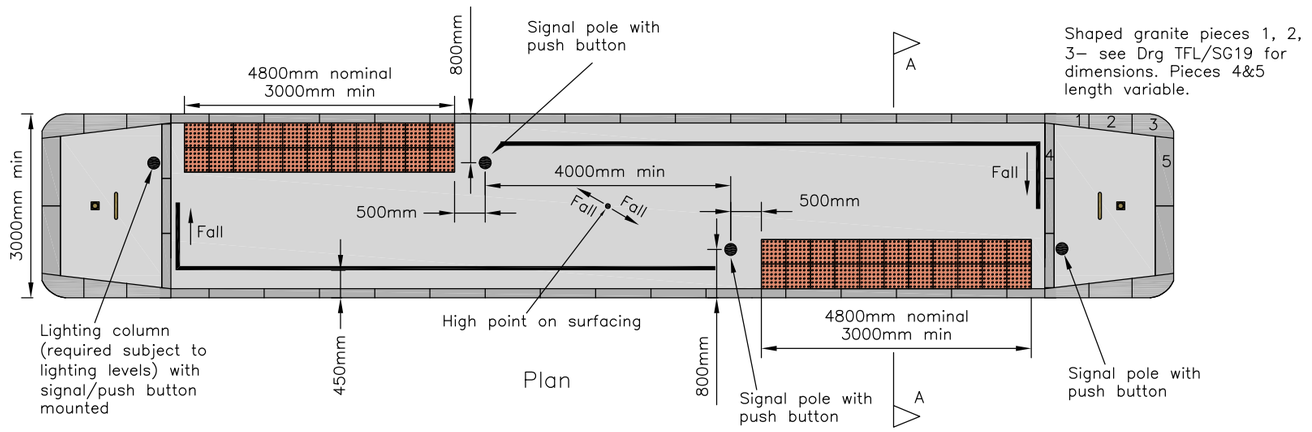
GUIDANCE ISSUE No 2

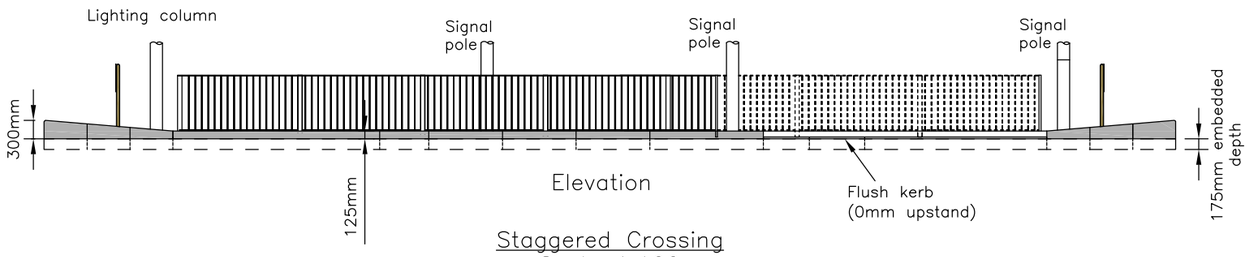
Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

Drawing No. TFL/SG02

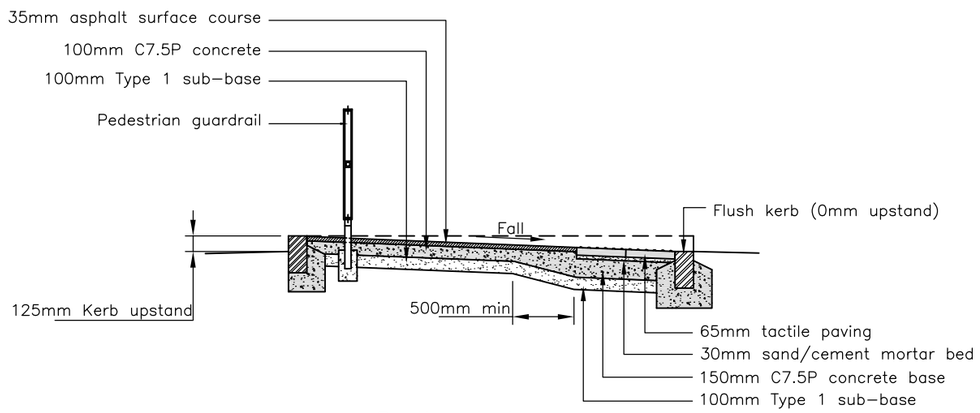
Rev 5

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.





Staggered Crossing
Scale 1:100



Section A–A
Scale 1:50

Legend

- Red blister paving: concrete modular, 400x400x65mm
- Asphalt surfacing
- 150mm Granite kerb, fine picked

Notes

1. Power supply with secondary connection for uplighter subject to agreement with local authority.
2. Granite kerbs to comply with BS 435:1975
3. Precast kerbs to comply with BS 7263: part 1:1994
4. Refer to Drg. TFL/SG28 for section details
5. Refer to Drg TFL/SG20 for keep left sign and uplighter details
6. Signal poles must be positioned to provide a minimum lateral clearance of 450mm from all signal equipment to kerb face.

Rev.	Date	Description	Chkd.	App.
5	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	17/03/08	MINOR AMENDMENTS	MDR	CNR
2	17/12/07	Minor Amendments	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Pedestrian Refuge Island with Guardrail

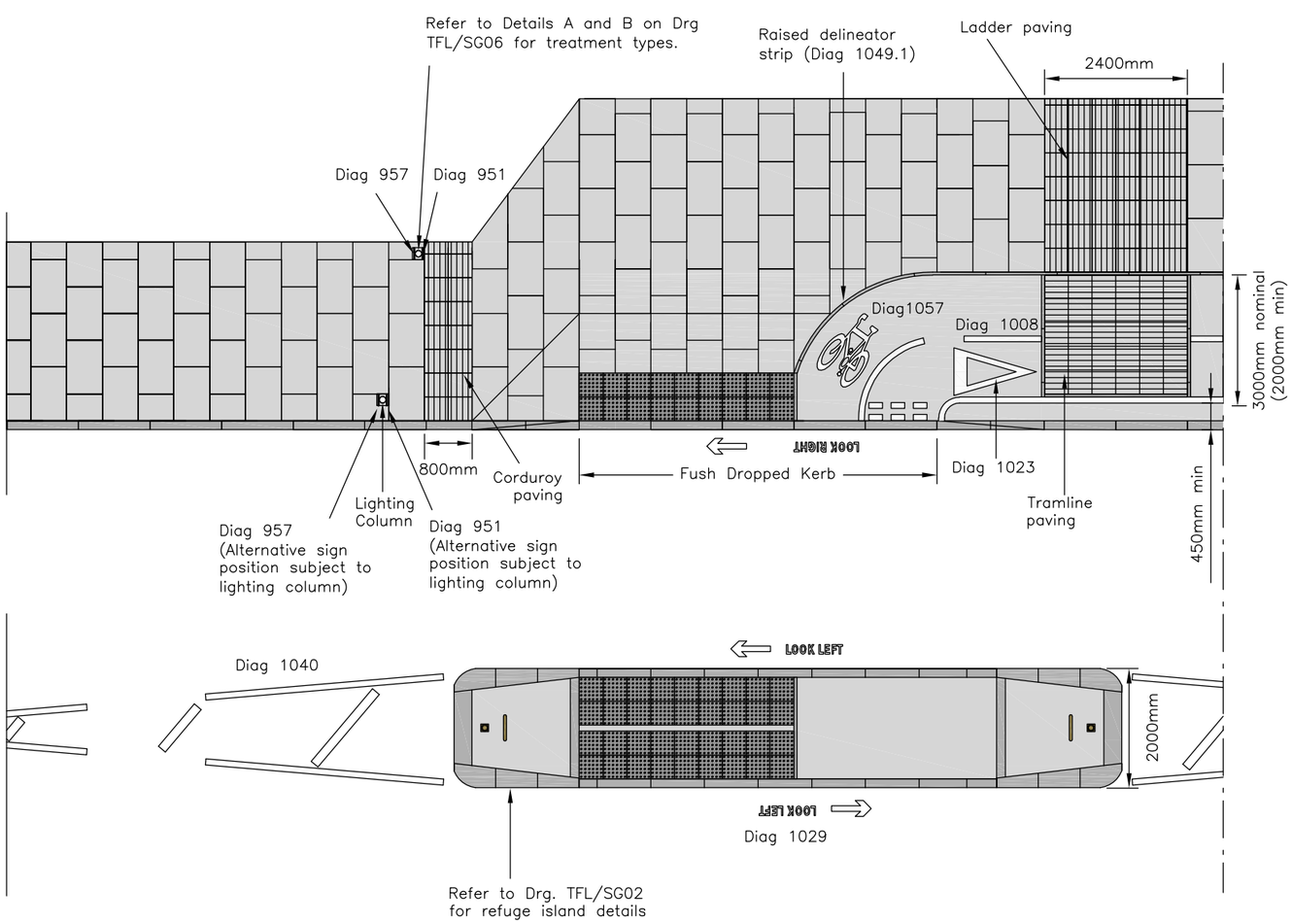
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:100	A3

Drawing No. TFL/SG03

Rev 5

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Granite Kerb dropped over approximately 1800mm to provide a flush fine picked silver grey kerb (0mm upstand) over crossing width.
7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
8. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Charcoal grey blister paving: concrete modular, 400x400x65mm
- Corduroy paving: colour to match concrete flags, concrete modular, 400x400x65mm
- Ladder paving: colour to match concrete flags, concrete modular, 400x400x65mm
- Tramline paving: colour to match asphalt, concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
5	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
4	17/11/07	MINOR AMENDMENTS	GSV	LD
3	10/08/05	GUIDANCE ISSUE No 1	SK	RD
2	02/08/05	CLIENT AMENDMENTS	RD	IH
1	10/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Segregated Shared Route at Uncontrolled Crossing Point

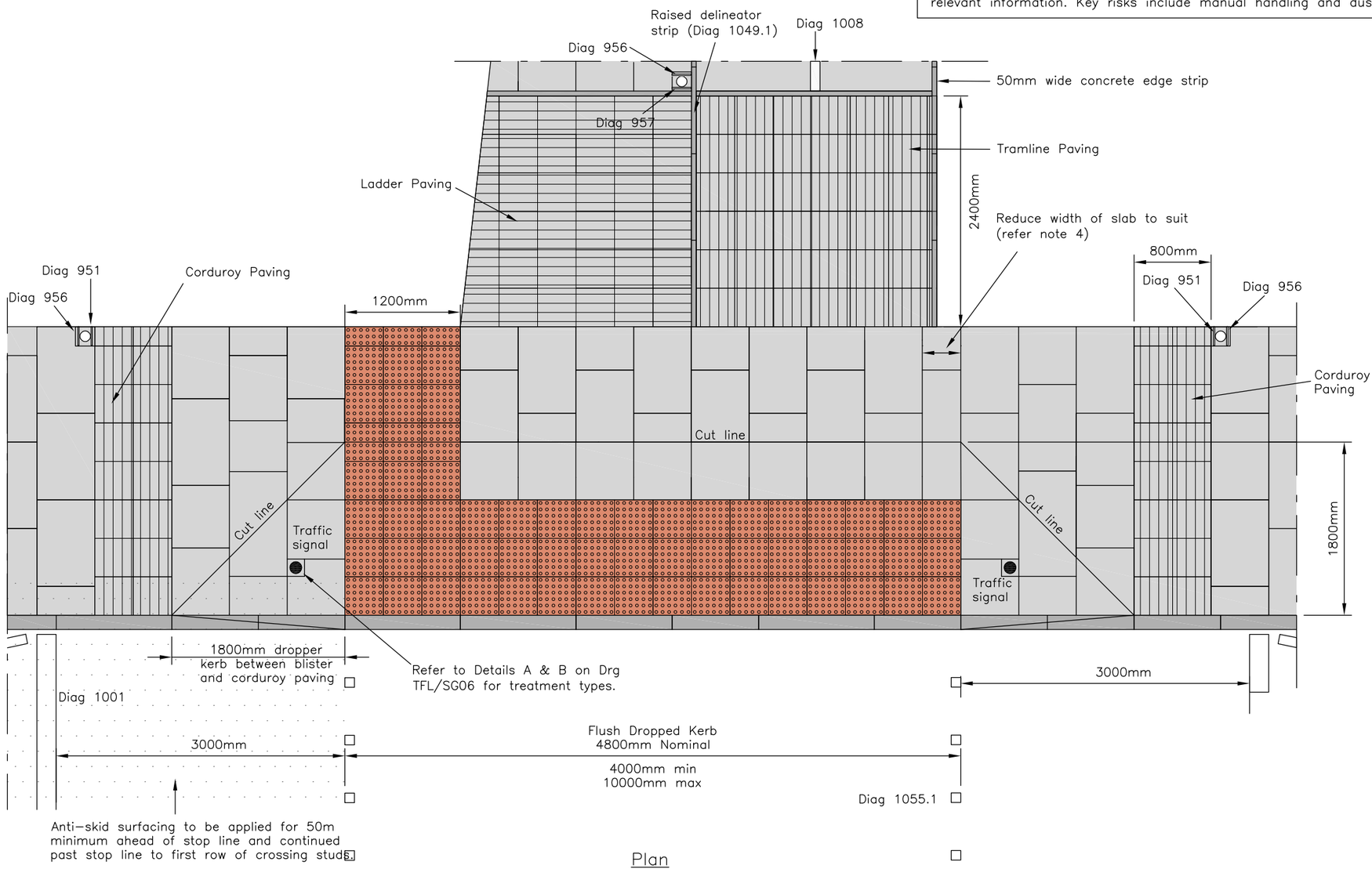
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:100	A3

Drawing No. TFL/SG04

Rev 5

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:50

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Granite kerb dropped over approximately 1800mm to provide a flush fine picked silver grey kerb (0mm upstand) over crossing width.
7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
8. Signal poles must be positioned to provide a minimum lateral clearance of 450mm from all signal equipment to kerb face.
9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Red blister paving: concrete modular, 400x400x65mm
- Corduroy paving: colour to match concrete flags, concrete modular, 400x400x65mm
- Tramline paving: colour to match asphalt, concrete modular, 400x400x65mm
- Ladder paving: colour to match concrete flags, concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing
- Anti–skid surfacing
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
4	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
3	17/11/07	MINOR AMENDMENTS	GSV	LD
2	01/08/05	GUIDANCE ISSUE No 1	SK	RD
1	02/08/05	CLIENT AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project

Streetscape Guidance

Drawing Title

Segregated Shared Route at a Toucan Crossing

Drawing Status

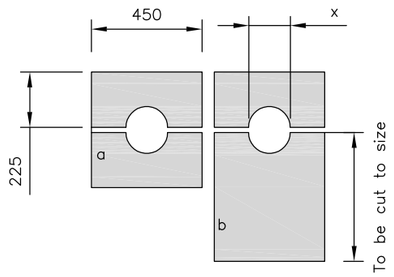
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:50	A3

Drawing No. TFL/SG05

Rev 4

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.

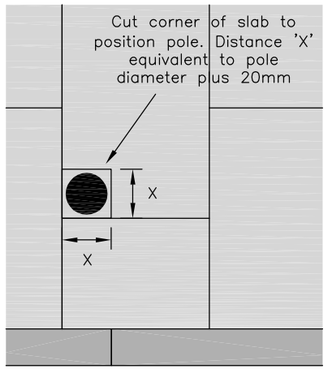


Detail A
Scale 1:25

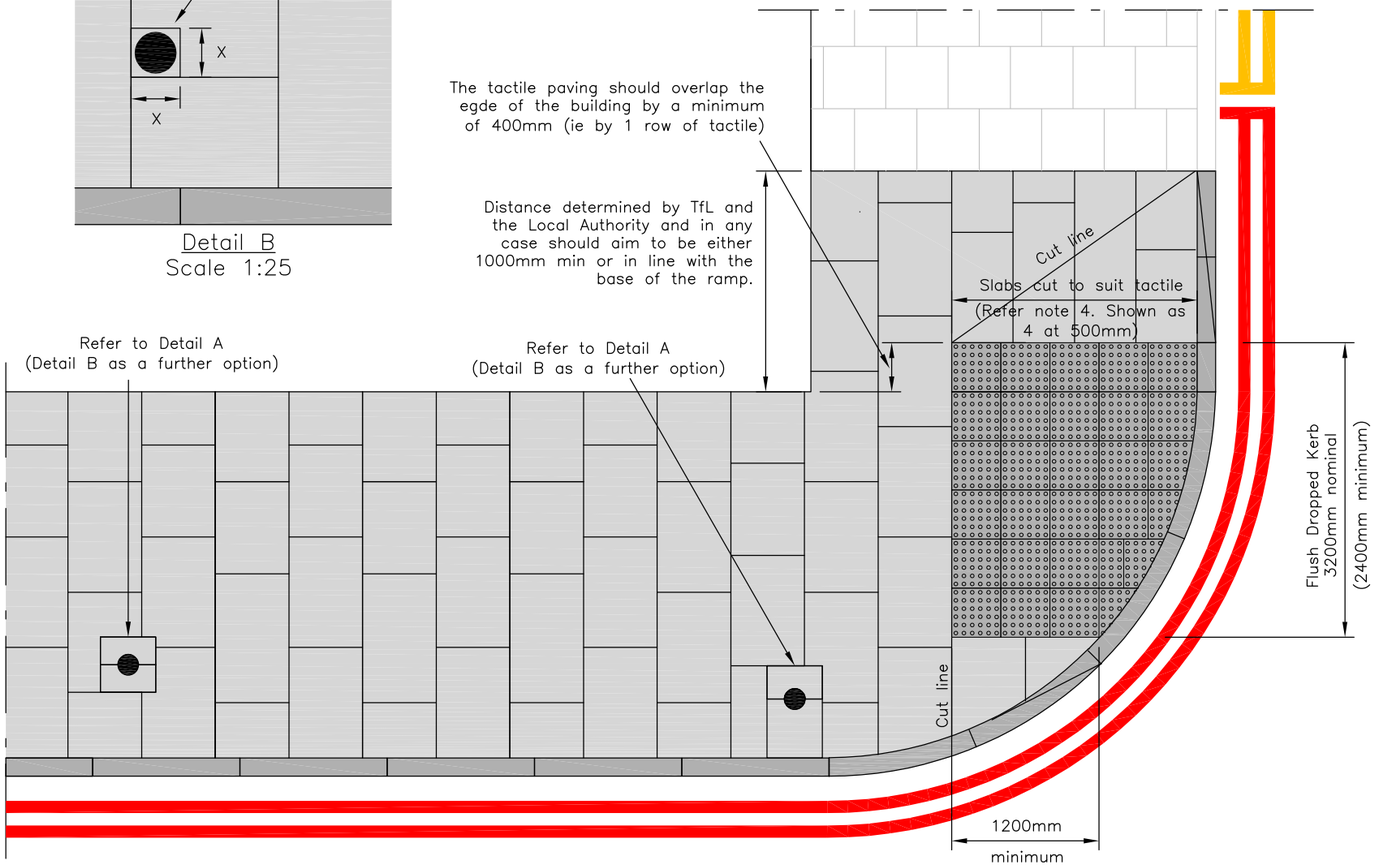
Optional treatment around posts:

1. Concrete ready-made at lengths of a=225mm and b=525mm with semi-circular cut-out with variable diameter from x=60mm to x=230mm.

2. On-site core drilled flag with semi-circular arrangement as indicated.



Detail B
Scale 1:25



Plan
Scale 1:50

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.

2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.

3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.

4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.

5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.

6. Granite kerb dropped over approximately 1800mm to provide a flush fine picked silver grey kerb (0mm upstand) over crossing width.

7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)

8. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.

9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Charcoal grey blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Existing footway
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
6	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
5	02/04/08	MINOR AMENDMENTS	MDR	CNR
4	17/12/07	MINOR AMENDMENTS	GSV	LD
3	10/08/05	GUIDANCE ISSUE No 1	SK	RD
2	02/08/05	CLIENT AMENDMENTS	RD	IH
1	10/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Uncontrolled Pedestrian Crossing at Side Road

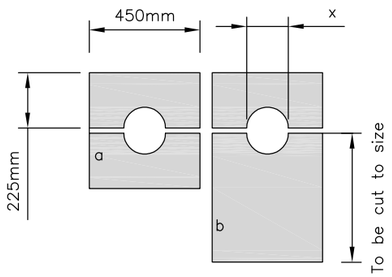
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

Drawing No. TFL/SG06

Rev 6

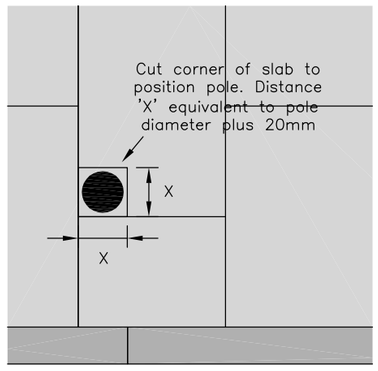
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



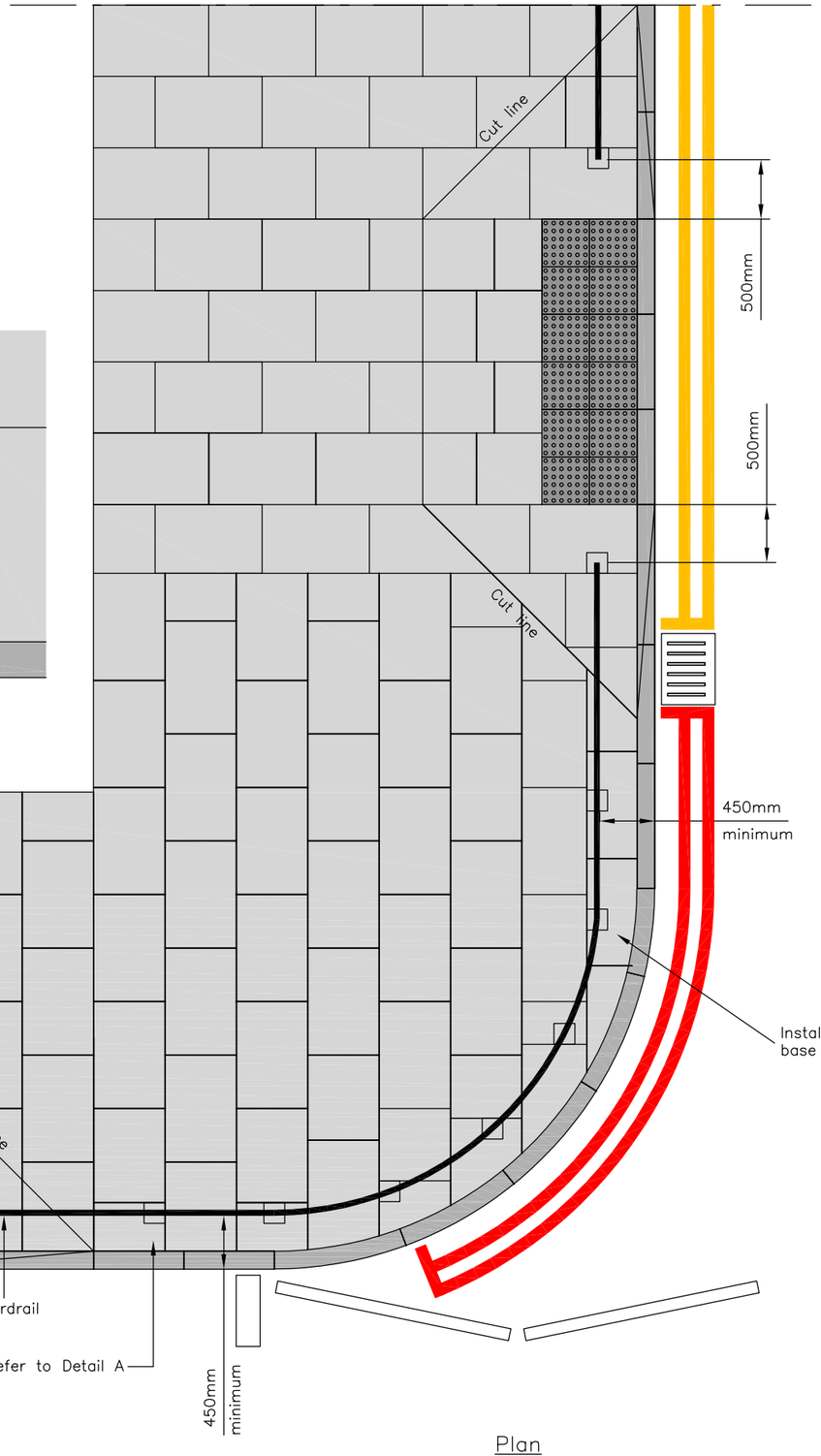
Optional treatment around posts:

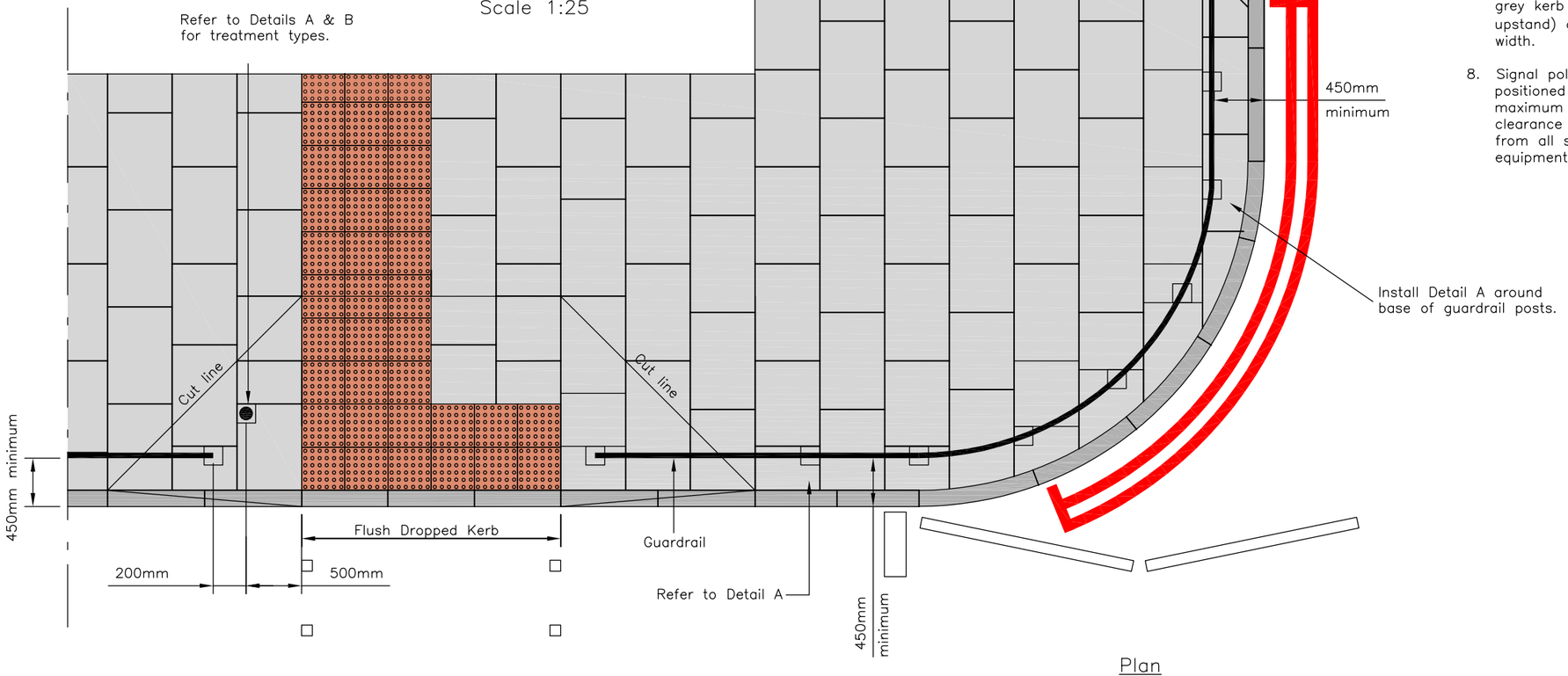
1. Concrete ready-made at lengths of a=225mm and b=525mm with semi-circular cut-out with variable diameter from x=60mm to x=230mm.
2. On-site core drilled flag with semi-circular arrangement as indicated.

Detail A
Scale 1:25



Detail B
Scale 1:25





Plan
Scale 1:50

Notes

1. Pedestrian guardrails shall be manufactured to the requirements of BS 3049.
2. All fasteners shall be stainless steel.
3. High visibility optimum sight angle 14° unless notified otherwise.
4. Curved sections to be in 1000mm lengths.
5. Straight sections of 1000mm length are acceptable if curved sections of a suitable radius are unavailable.
6. Please note that the arrangement of paving slabs on this detail is for illustrative purposes only. During construction slabs shall be cut in such a manner that no elements of paving less than 150mm wide shall be used.
7. Granite kerb dropped over approximately 1800mm to provide a flush fine picked silver grey kerb (0mm upstand) over crossing width.
8. Signal poles must be positioned to provide a maximum lateral clearance of 450mm from all signal equipment to kerb face.

Legend

- Red blister paving: concrete modular, 400x400x65mm
- Charcoal grey blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
9	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
8	02/04/08	MINOR AMENDMENTS	MDR	CNR
7	17/12/07	MINOR AMENDMENTS	GSV	LD
6	10/08/05	GUIDANCE ISSUE No 1	SK	RD
5	02/08/05	CLIENT AMENDMENTS	RD	IH
4	06/07/05	MINOR AMENDMENTS TO PAVING AND ADDITIONAL NOTES	KT	IH
3	05/07/05	MINOR AMENDMENTS TO PAVING SLABS	KT	DP
2	21/06/05	MINOR AMENDMENTS.	RD	IH
1	10/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Detail	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Guardrail Detail

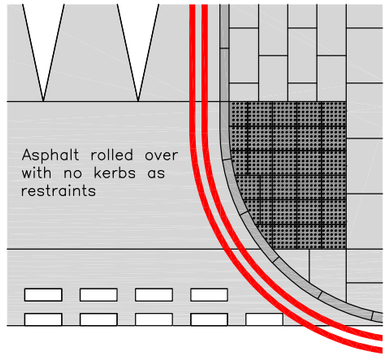
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As Shown	A3

Drawing No.
TFL/SG07

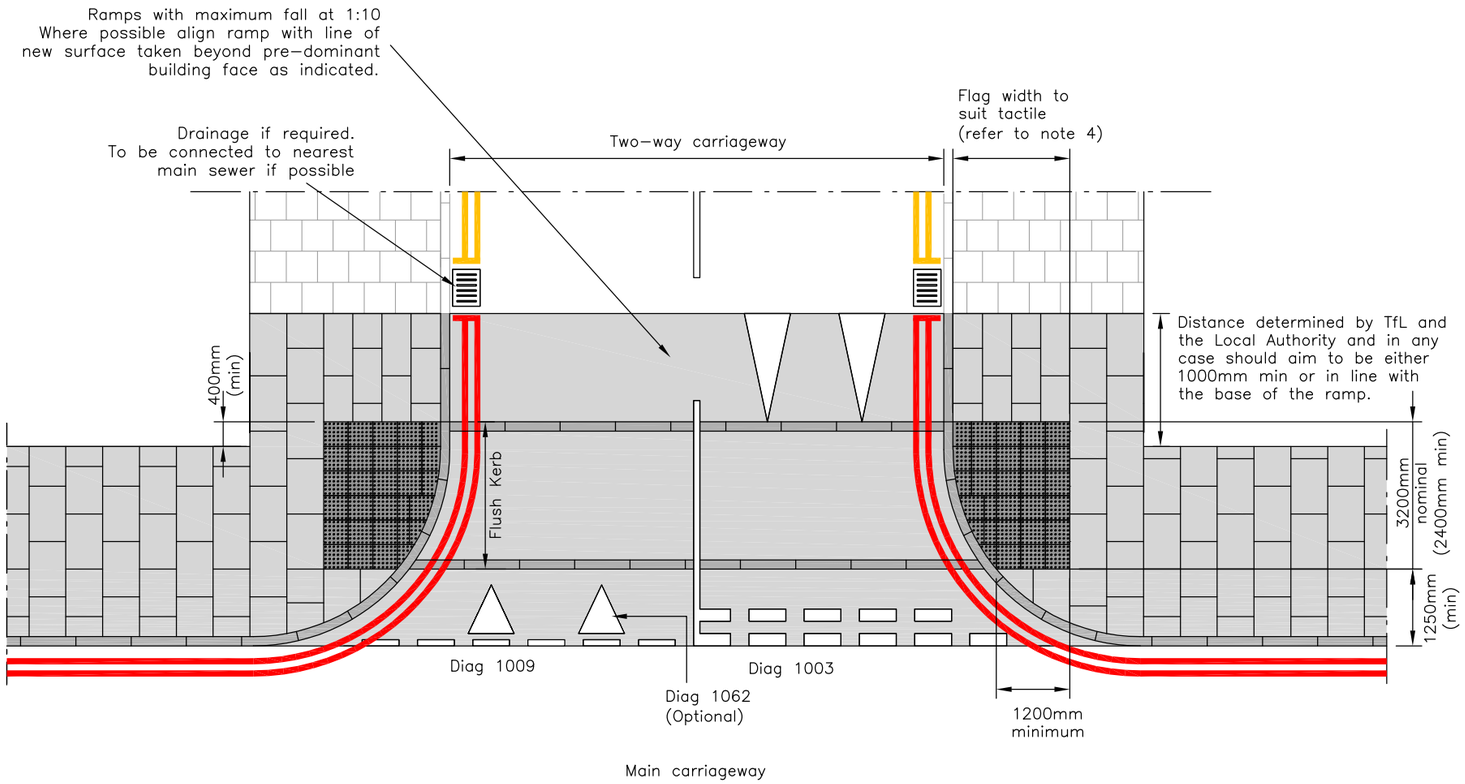
Rev
9

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Detail A

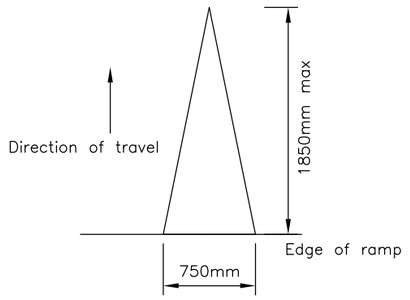
Other Paving Option
Scale 1:100



Plan
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Uncut concrete flags should be used wherever possible. Where this is not possible, care should be taken to ensure all flags are as large as possible. Cutting should be kept to a mimimum and should not be cut so that a width less than 300mm remains.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway. Flush kerbs to be fine picked silver grey.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).



Diag 1062
Not to scale

Legend

- Charcoal grey blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing
- Existing footway
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
5	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
4	17/12/07	MINOR AMENDMENTS	GSV	LD
3	10/08/05	GUIDANCE ISSUE No 1	SK	RD
2	10/06/05	MINOR AMENDMENTS	RD	IH
1	07/04/05	Client amendments	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Side Road (Two-Way)
Raised Entry Treatment–
Uncontrolled Crossing–Paving Options

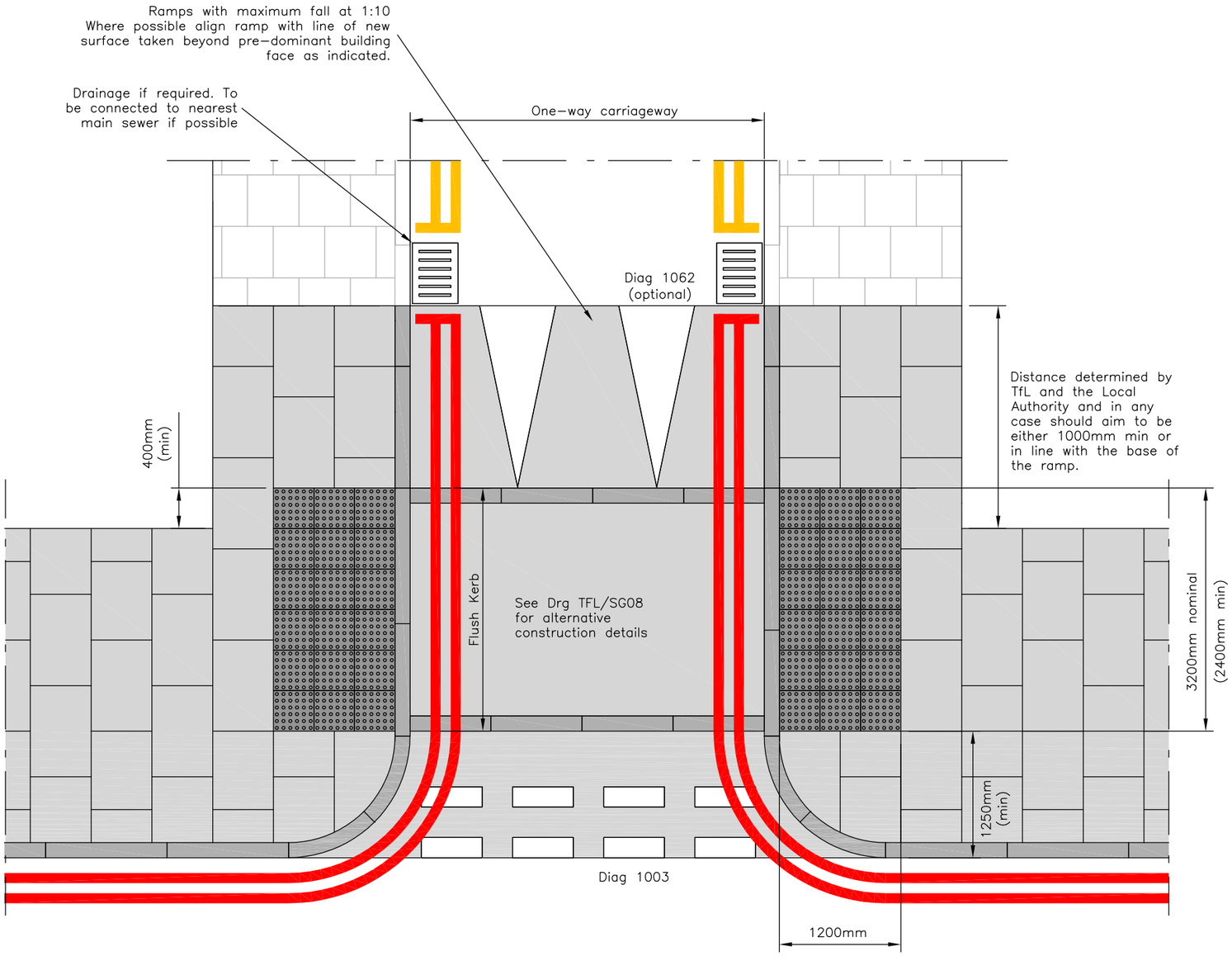
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

Drawing No. TFL/SG08

Rev 5

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:50

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway. Flush kerbs to be fine picked silver grey.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Charcoal grey blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing
- Existing footway
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
4	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
3	17/12/07	MINOR AMENDMENTS	GSV	LD
2	01/08/05	GUIDANCE ISSUE No 1	SK	RD
1	02/08/05	CLIENT AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Side Road (One–Way)
Raised Entry Treatment–
Uncontrolled Crossing

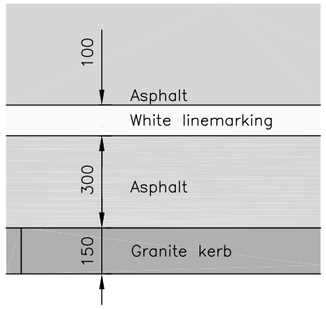
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:50	A3

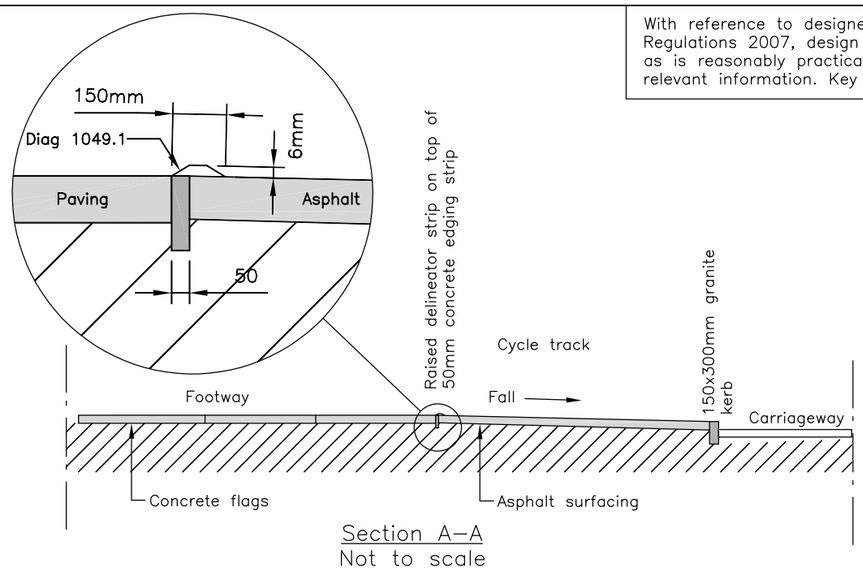
Drawing No. TFL/SG09

Rev 4

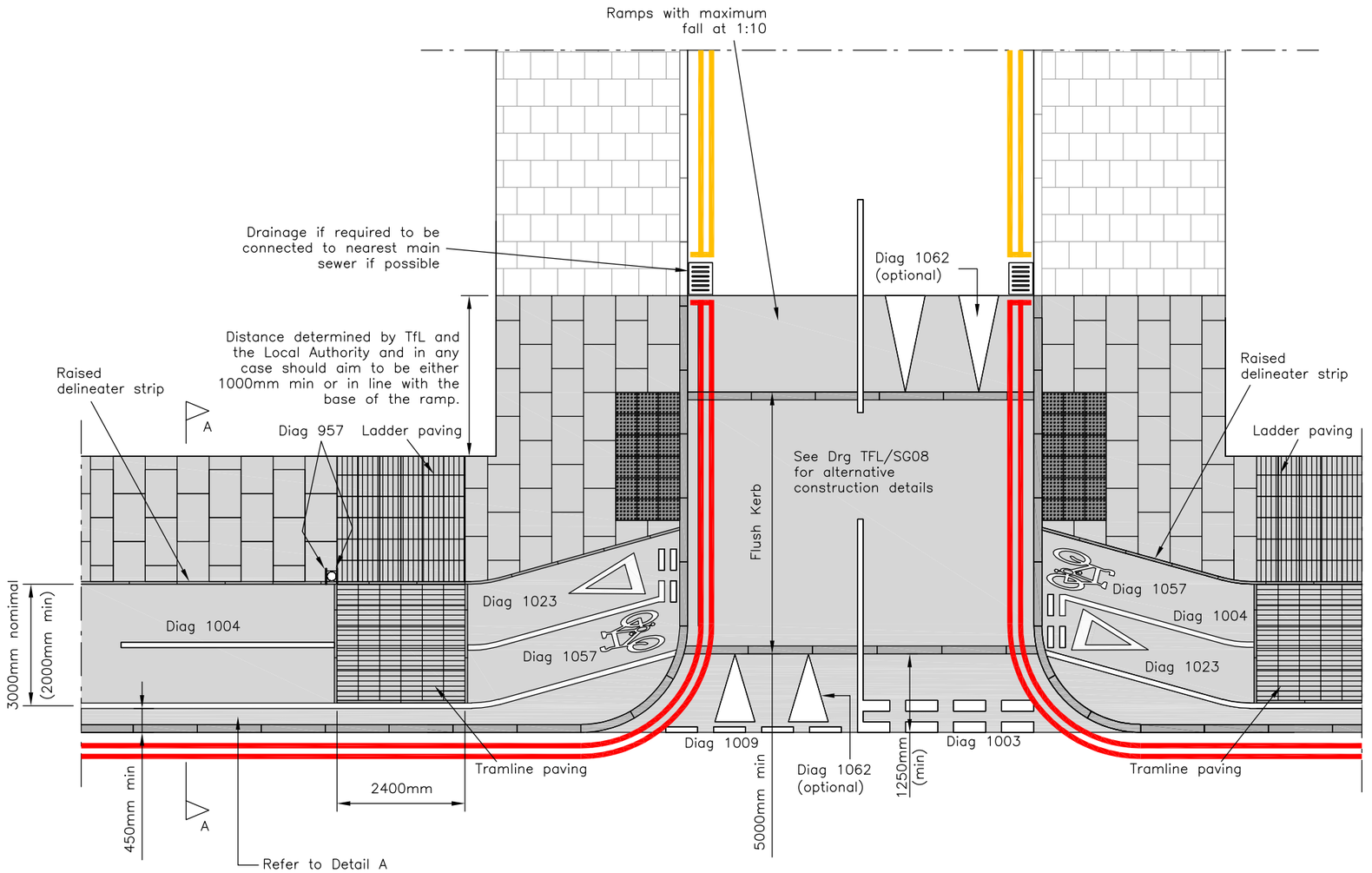
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Detail A
Scale 1:20



Section A–A
Not to scale



Plan
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway. Flush kerbs to be fine picked silver grey.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Charcoal grey blister paving: concrete modular, 400x400x65mm
- Ladder paving, colour to match concrete flags, : concrete modular, 400x400x65mm
- Tramline paving, colour to match asphalt, : concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing
- Existing footway
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	17/11/07	MINOR AMENDMENTS	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Segregated/Shared Route Entry Treatment–
Set Back Less than Five Metres

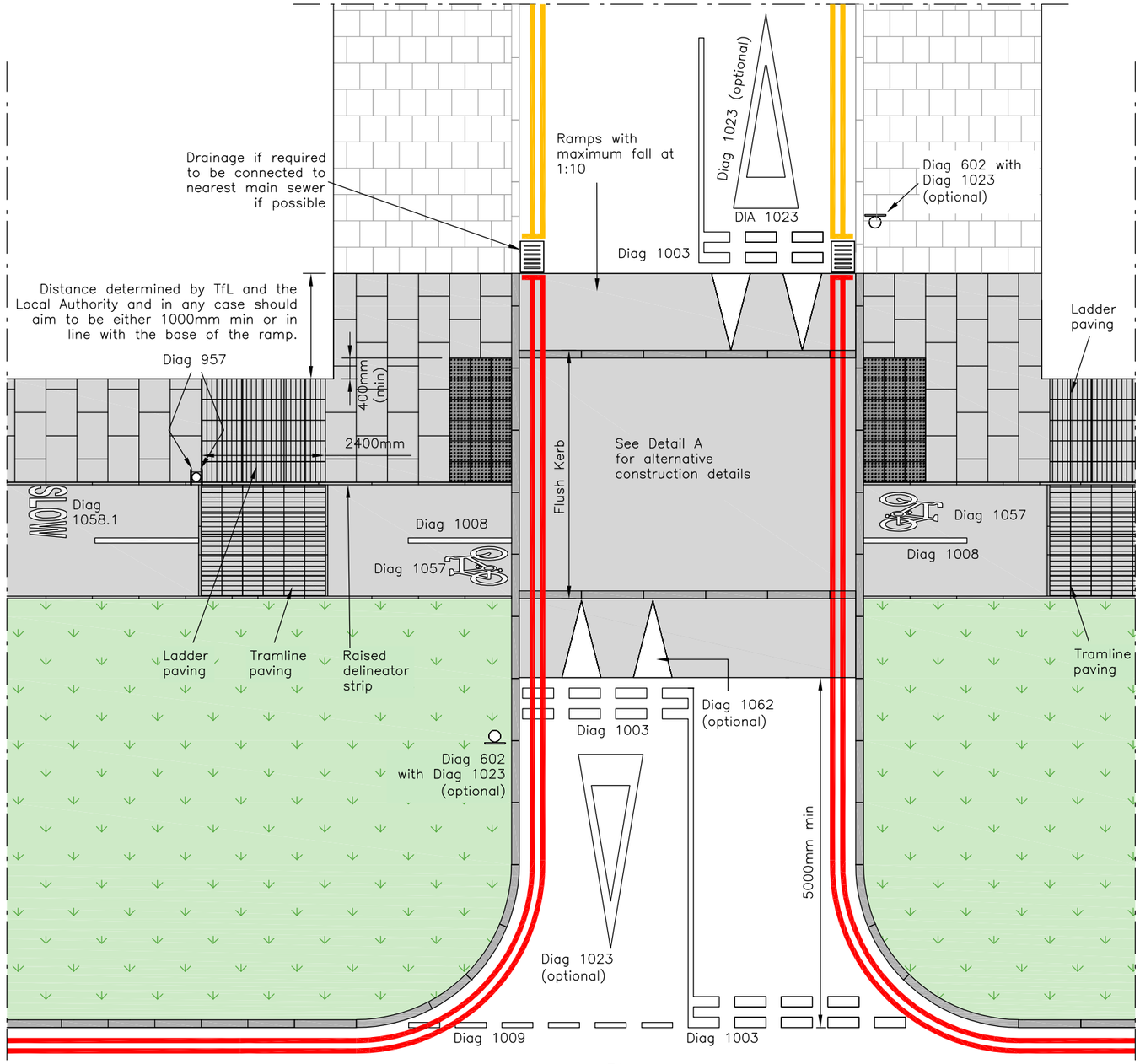
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

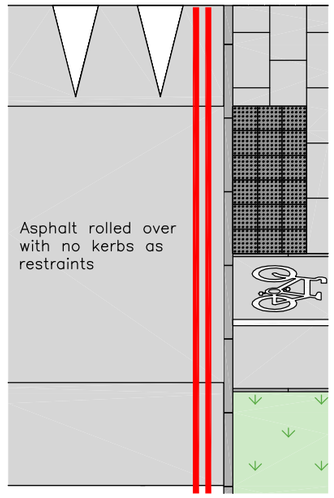
Drawing No. TFL/SG10

Rev 3

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:100



Detail A
Other Paving Option
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway. Flush kerbs to be fine picked silver grey.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Charcoal grey blister paving: concrete modular, 400x400x65mm
- Ladder paving, colour to match concrete flags, concrete modular, 400x400x65mm
- Tramline paving, colour to match asphalt, concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing
- Existing footway
- Grass verge
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
5	19/05/08	GUIDANCE ISSUE No 2	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	17/11/07	MINOR AMENDMENTS	GSV	LD
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	10/08/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Segregated/Shared Route
at Entry Treatment–
Set Back More than Five Metres

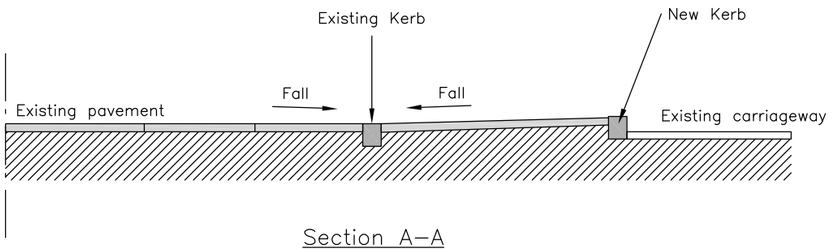
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:100	A3

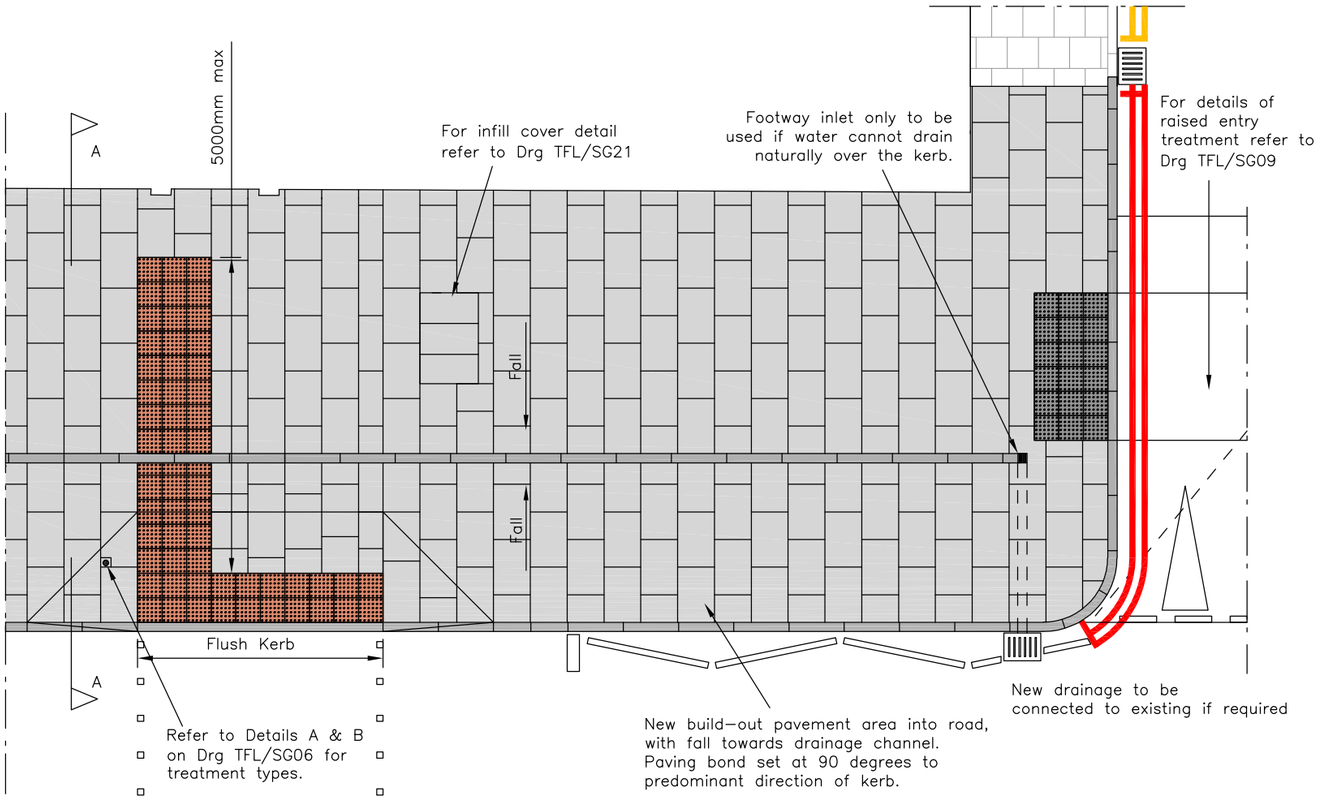
Drawing No. TFL/SG11

Rev 5

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Section A–A
Not to scale



Plan
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Kerb dropped over approximately 1800mm to provide a flush fine picked silver grey kerb (0mm upstand) over crossing width.
7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
8. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- Red blister paving: concrete modular, 400x400x65mm
- Charcoal grey blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Existing footway
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
6	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
5	19/05/08	MINOR AMENDMENTS	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	17/12/07	MINOR AMENDMENTS	GSV	LD
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	02/08/05	CLIENT AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Footway Buildout–
Drainage Details

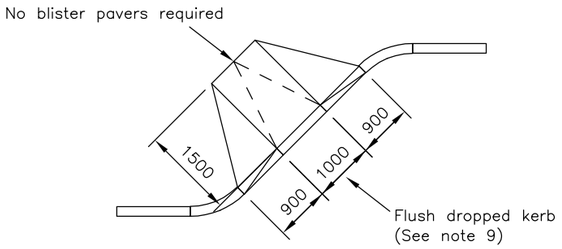
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

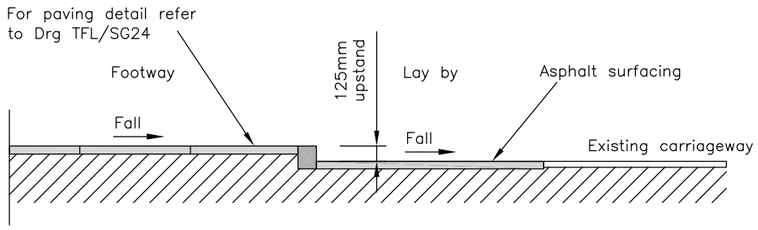
Drawing No. TFL/SG12

Rev 6

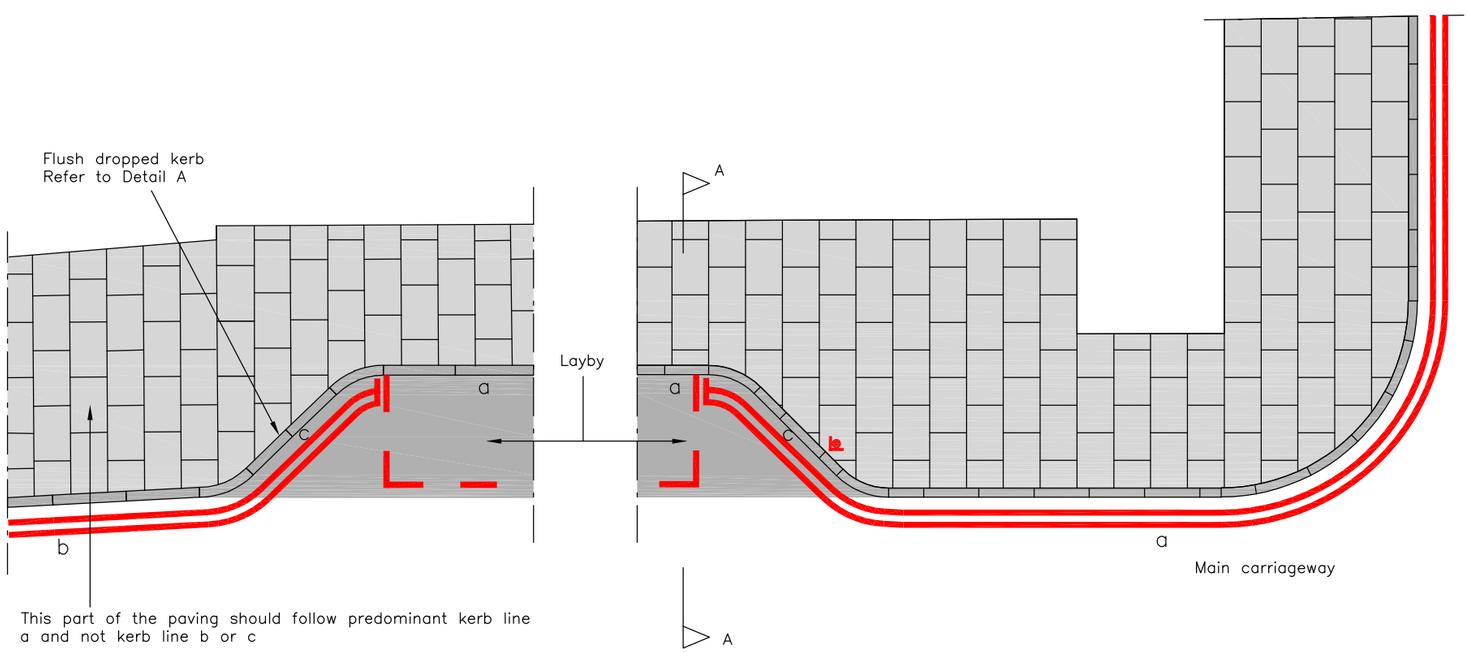
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Detail A
Not to scale



Section A–A
Not to scale



Plan of Layby
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).
9. Kerb dropped over approximately 900mm to provide flush kerb (0mm upstand).

Legend

- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing
- Road markings in thermoplastic screed or equivalent
- Bi–directional waiting restriction sign

Rev.	Date	Description	Chkd.	App.
6	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
5	19/05/08	MINOR AMENDMENTS	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	10/01/08	MINOR AMENDMENTS	GSV	LD
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	10/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Inset Stopping/Parking Details

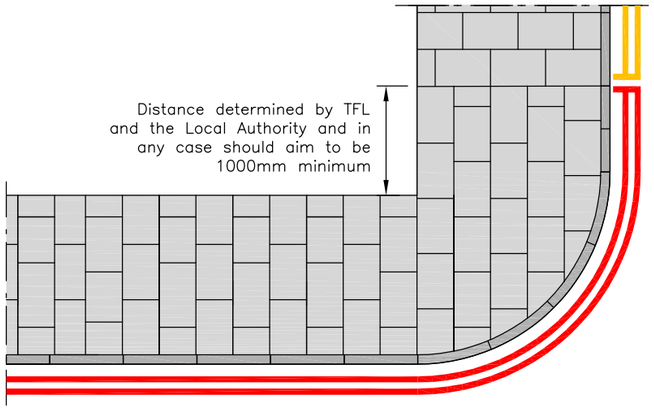
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

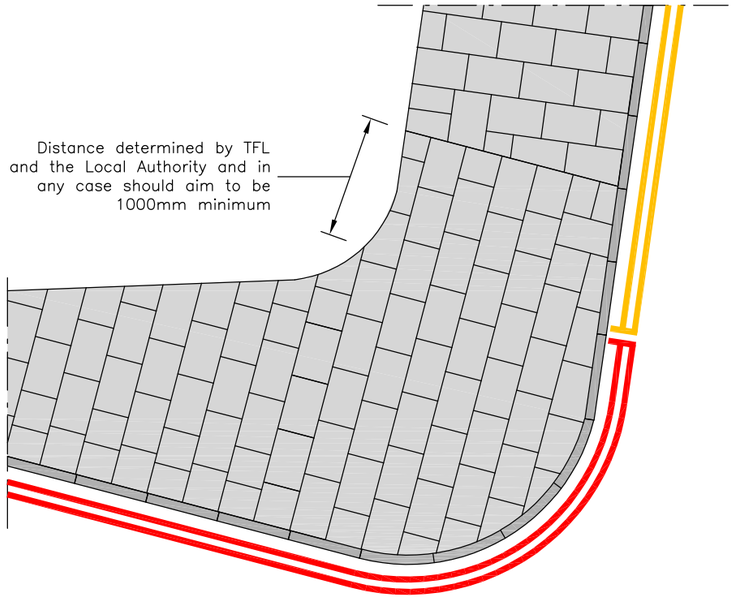
Drawing No. TFL/SG13

Rev 6

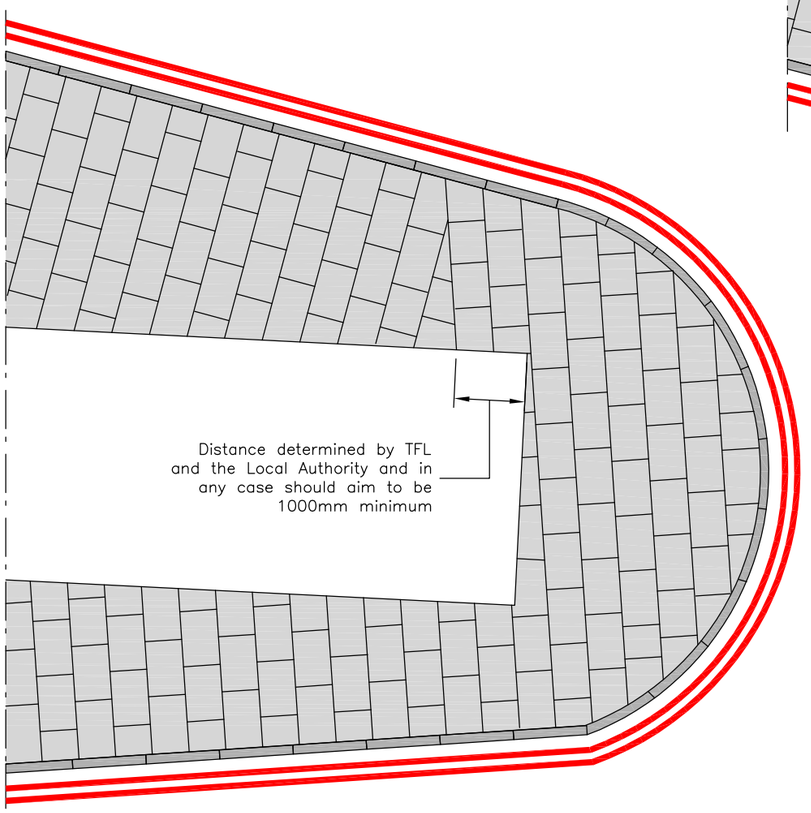
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan A
Scale 1:100



Plan B
Scale 1:100



Plan C
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent

Rev.	Date	Description	Chkd.	App.
4	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
3	01/04/08	MINOR AMENDMENTS	MDR	CNR
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	07/04/05	Client amendments	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Paving Details for Directional Changes

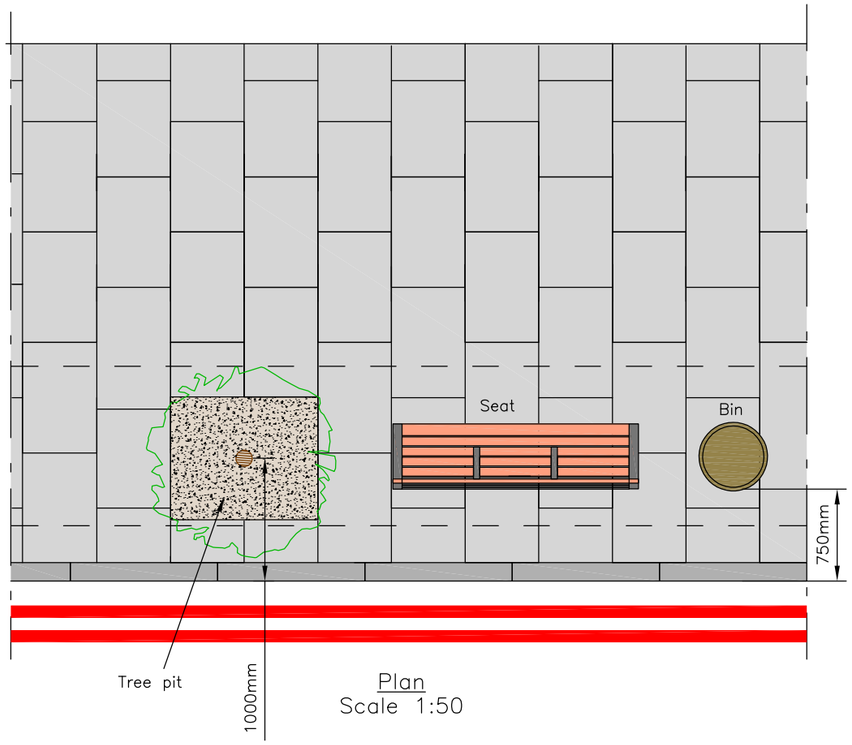
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:100	A3

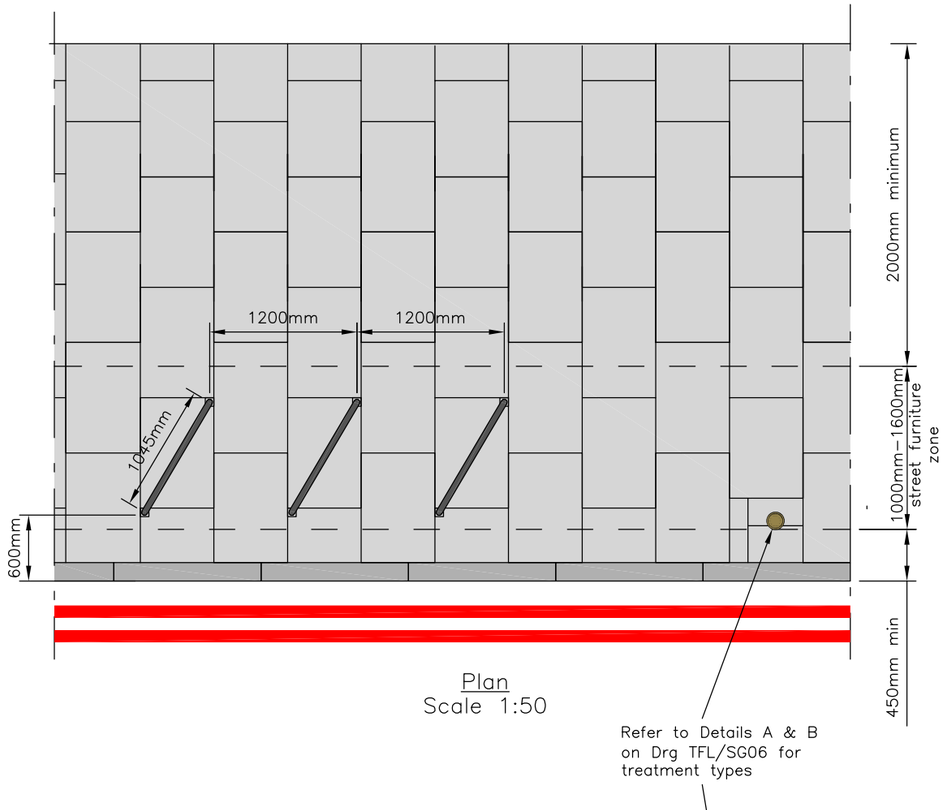
Drawing No. TFL/SG14

Rev 4

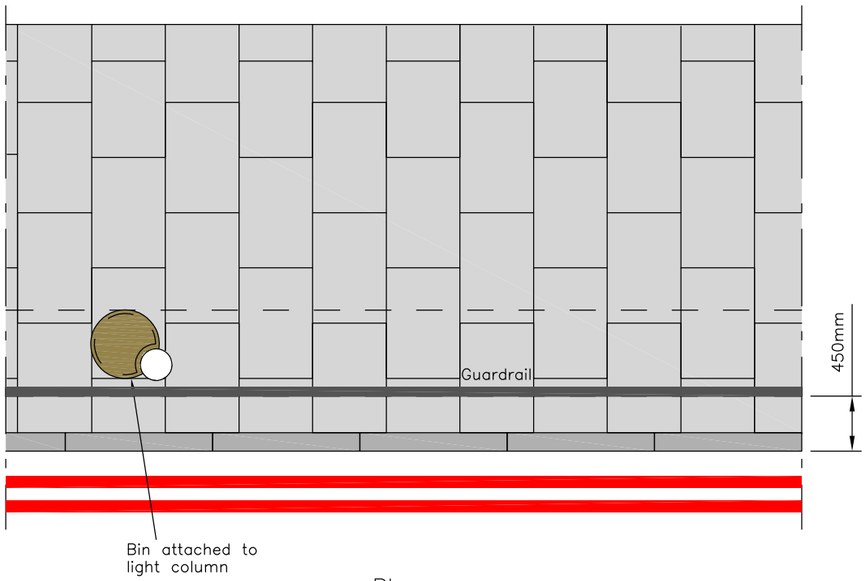
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



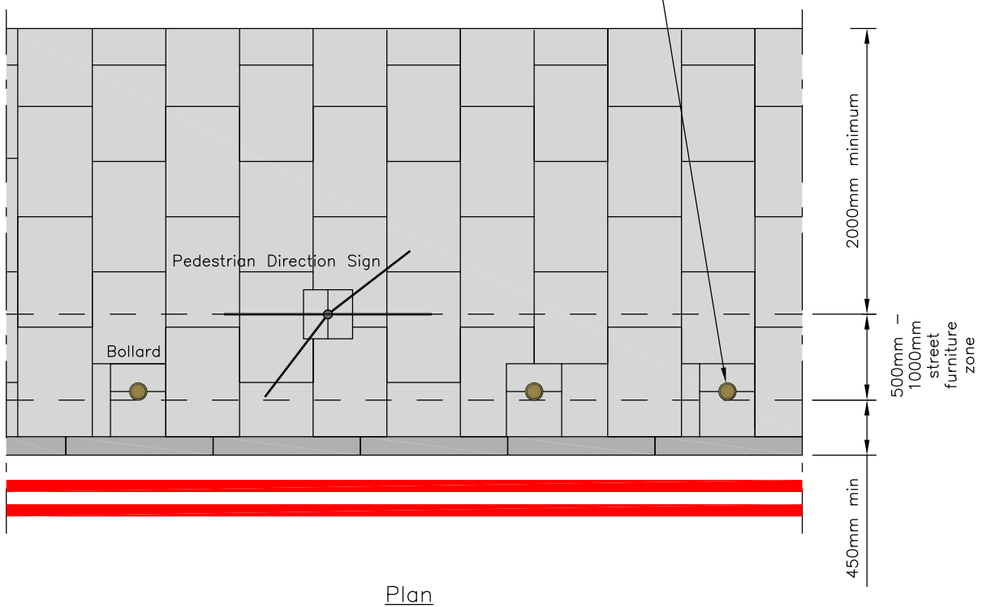
Plan
Scale 1:50



Plan
Scale 1:50



Plan
Scale 1:50



Plan
Scale 1:50

Legend

- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent
- Tree pit
- Tree

Notes

1. Refer to Streetscape Guidance for further requirements.
2. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.

Rev.	Date	Description	Chkd.	App.
5	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
4	17/11/07	MINOR AMENDMENTS	SK	RD
3	10/08/05	GUIDANCE ISSUE No 1	SK	RD
2	02/08/05	CLIENT AMENDMENTS	RD	IH
1	10/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project

Streetscape Guidance

Drawing Title

Street Furniture Layout
Footway Widths Between 2.95m and 4.05m

Drawing Status

GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:50	A3

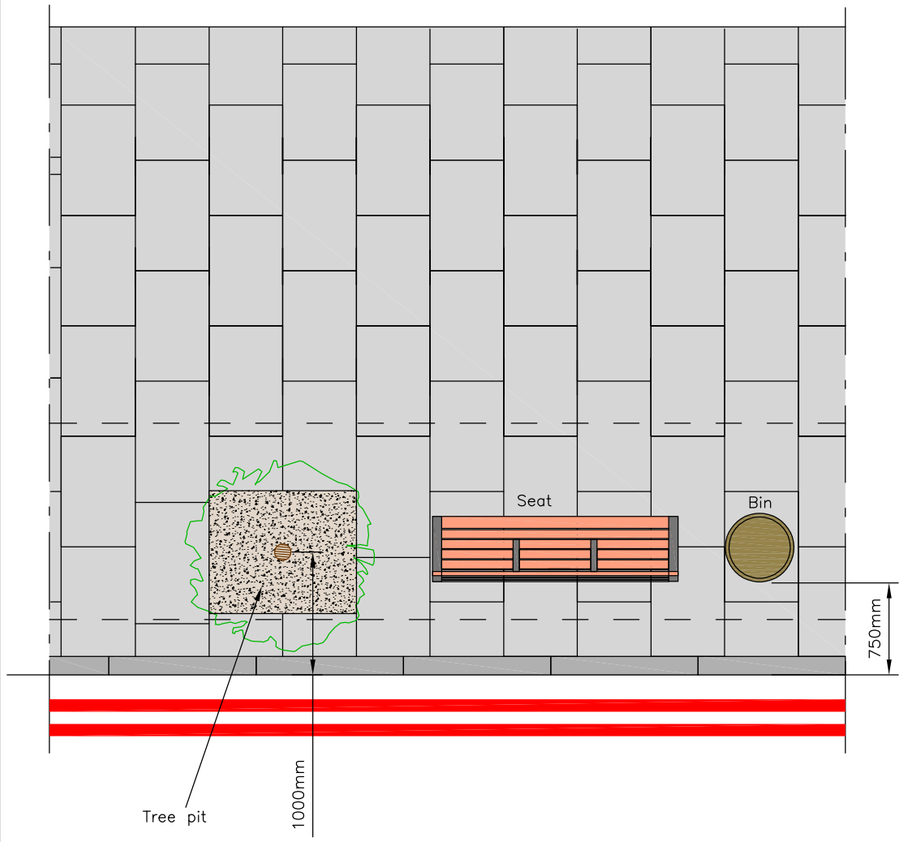
Drawing No.

TFL/SG15

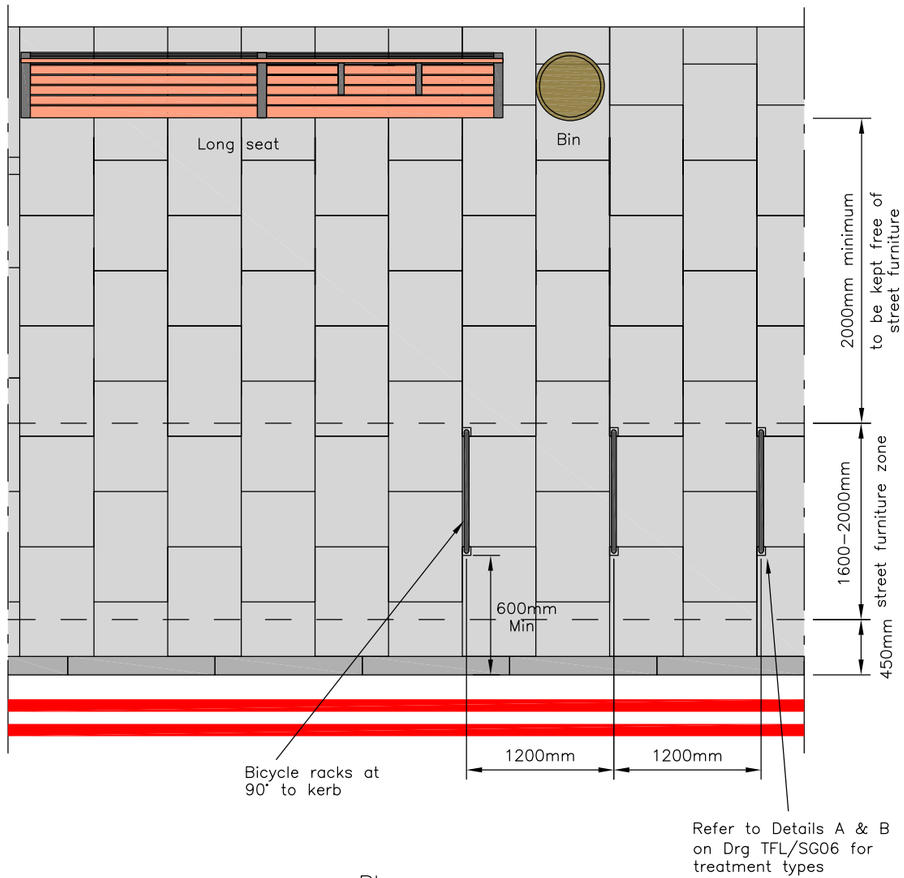
Rev

5

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:50



Plan
Scale 1:50

Legend

- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent
- Tree pit
- Tree

Notes

1. Refer to Streetscape Guidance for further requirements.
2. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.

Rev.	Date	Description	Chkd.	App.
4	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
3	17/12/07	MINOR AMENDMENTS	GSV	LD
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	10/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

Project

Streetscape Guidance

Drawing Title

Street Furniture Layout
Footway Width More Than 4.05m

Drawing Status

GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:50	A3

Drawing No. TFL/SG16

Rev 4

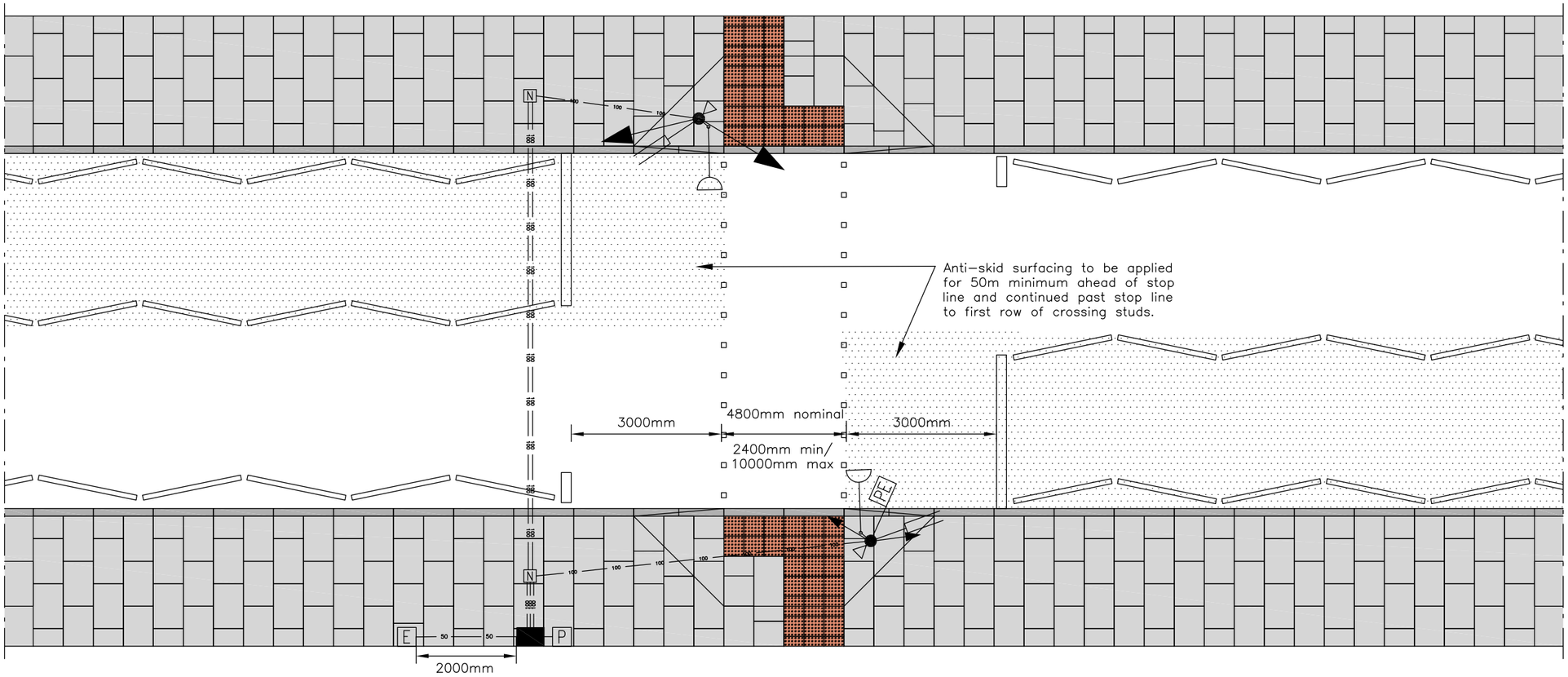
Notes

1. All works to be carried out to the relevant TFL specification
2. Duct layout is indicative only & subject to site conditions
3. Traffic signal poles must be positioned to provide a minimum lateral clearance of 450mm from all signal equipment to kerb face.
4. All poles to be installed directly into ground
5. Pushbuttons to be mounted at 45° to kerb on all poles
6. All pushbuttons to have tactile rotating cones
7. All pushbuttons to have audibles

Period	Signal to vehicles	Signal to pedestrian	Durations (seconds)
A	Green	Red	7 to 20
B	Amber	Red	3
C	Red	Red	1 to 3
D	Red	Green	5 to 7
E	Red	Flashing Green	0 to 2
F	Flashing Amber	Flashing Green	6 to 18
G	Flashing Amber	Red	1 to 2

Table 1: Pelican crossing timings

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:100

Engineer to specify width of crossing (between stud lines). Width should be in increments of 400 mm to accommodate exact number of standard 400x400mm blister paving slabs.

Ideal tactile arrangement as shown with 2 rows of blister for the width of the crossing and a tail of 3 blister slabs wide from the right hand side of the crossing extending to back of footway or to 5000mm maximum.

Legend:

- Red blister paving: concrete modular, 400x400x65mm
- Concrete flag, nominally 900x600x65mm
- 150mm Granite kerb, fine picked
- Dropper granite kerb, fine picked
- Anti–skid surfacing
- 3 aspect signal (rag) on pole
- 2 aspect pedestrian signal front–mounted
- Pedestrain pushbutton
- Microwave detector
- N — Proposed drawpit
- 50 — Prop. 50mm ø cable duct run
- 100 — Prop. 100mm ø cable duct run
- PE — Photo–electric cell
- E — Electricity supply pillar
- P — Post jointing large/small
- Controller

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	17/11/07	MINOR AMENDMENTS	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Pelican Crossing–
Signal Details

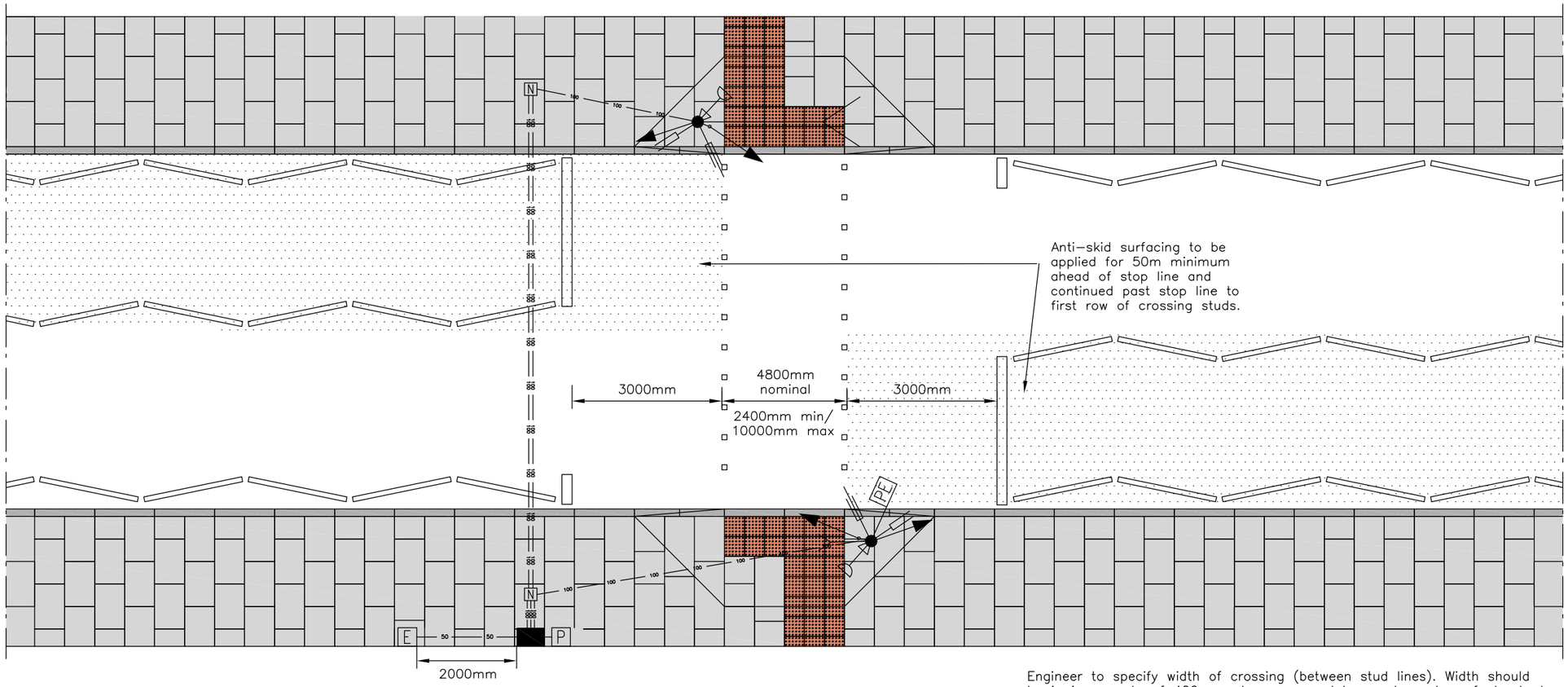
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:100	A3

Drawing No. TFL/SG17

Rev 3

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:100

Engineer to specify width of crossing (between stud lines). Width should be in increments of 400 mm to accommodate exact number of standard 400x400mm blister paving slabs.

Ideal tactile arrangement as shown with 2 rows of blister for the width of the crossing and a tail of 3 blister slabs wide from the right hand side of the crossing extending to back of footway or to 5000mm maximum.

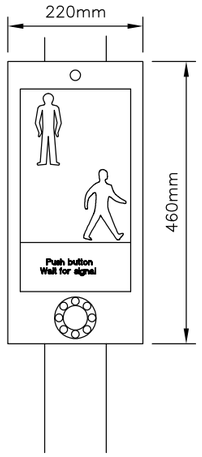


Figure 1
Scale 1:10

Puffin Crossing Timings

Period	Signal to Vehicles	Signal to Pedestrians	Durations (seconds)
1	Green	Red	7/20
2	Amber	Red	3
3	Red	Red	1 to 3
4	Red	Green	5
5	Red	Red (fix)	3
6	Red	Red (ext)	0 – 22
7	Red	Red (max)	3
8	Red	Red (gap)	0 to 3
9	Red & Amber	Red	2

Table 1: Puffin crossing timings

Notes

1. All works to be carried out to the relevant TFL specification
2. Duct layout is indicative only & subject to site conditions
3. Traffic signal poles must be positioned to provide a minimum lateral clearance of 450mm from all signal equipment to kerb face.
4. All poles to be installed directly into ground
5. Pushbuttons to be mounted at 45° to kerb on all poles
6. All pushbuttons to have tactile rotating cones
7. All pushbuttons to have audibles
8. Pushbutton plates to be as shown in Figure 1 (or similar)

Legend

- Red blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Dropper granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Anti–skid surfacing
- 3 aspect signal (RAG) on pole
- Pedestrian demand unit for use on puffin crossings
- Microwave detector
- Microwave detector (pedestrian kerbside)
- Microwave detector (pedestrian on–crossing)
- N — Proposed drawpit
- 50 — Prop. 50mm ø cable duct run
- 100 — Prop. 100mm ø cable duct run
- PE — Photo–electric cell
- E — Electricity supply pillar
- P — Post jointing large/small
- Controller

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	17/11/07	MINOR AMENDMENTS	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Puffin Crossing–
Signal Details

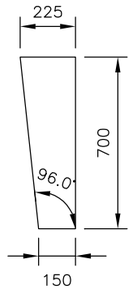
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

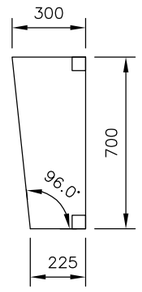
Drawing No. TFL/SG18

Rev 3

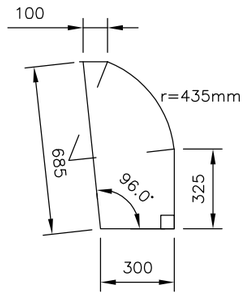
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



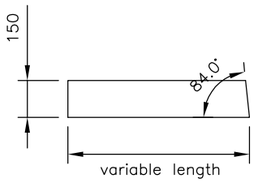
Kerb piece No.1



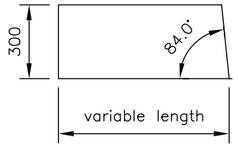
Kerb piece No.2



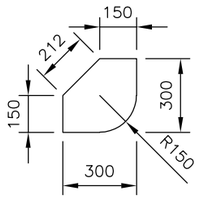
Kerb piece No.3



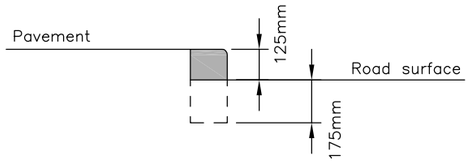
Kerb piece No.4



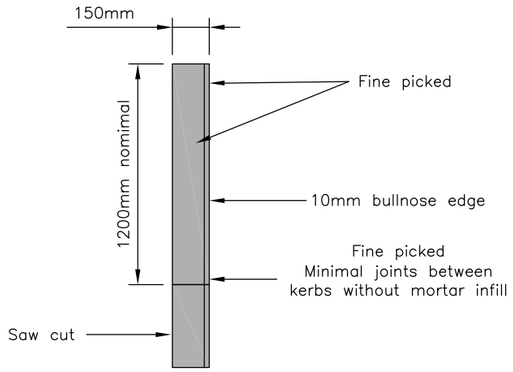
Kerb piece No.5



Kerb piece No.6

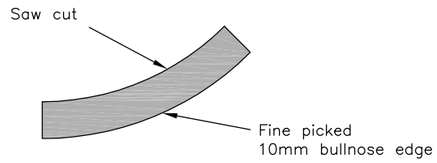


Side Elevation

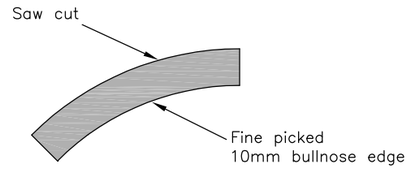


Plan

Typical Straight Kerb
Not to scale



External radius

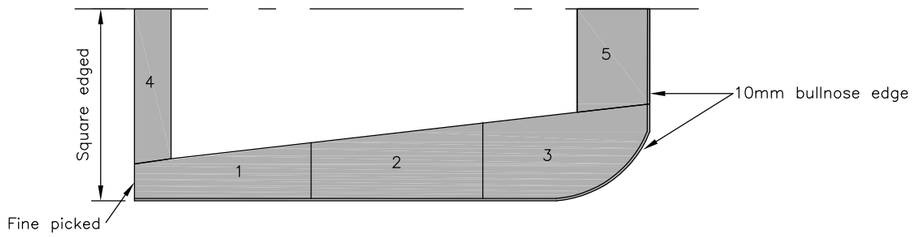


Internal radius

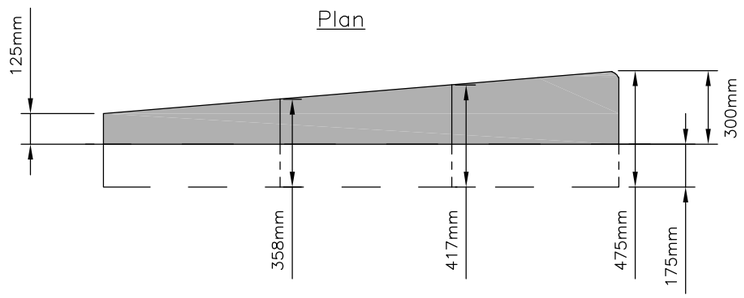
Typical Plan of Curved Kerbs
Not to scale

Notes

1. Fine picking of kerbs to stop 75mm before bottom of kerbs.
2. Concrete kerbs to the same dimensions may be used where adjacent kerbs are concrete.
3. All work must be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

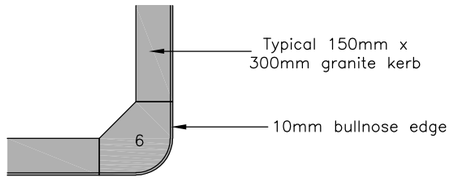


Plan

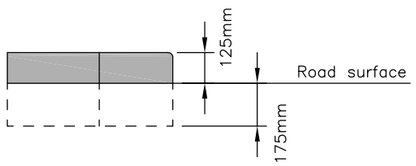


Side Elevation

Refuge Island Kerbs Option A
Scale1:25



Plan



Side Elevation

Refuge Island Kerbs Option B
Scale1:25

Rev.	Date	Description	Chkd.	App.
6	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
5	02/04/08	MINOR AMENDMENTS	MDR	CNR
4	01/04/08	MINOR AMENDMENTS	MDR	CNR
3	10/08/05	GUIDANCE ISSUE No 1	SK	RD
2	10/06/05	MINOR AMENDMENTS	RD	IH
1	07/04/05	Client amendments	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Kerb Details

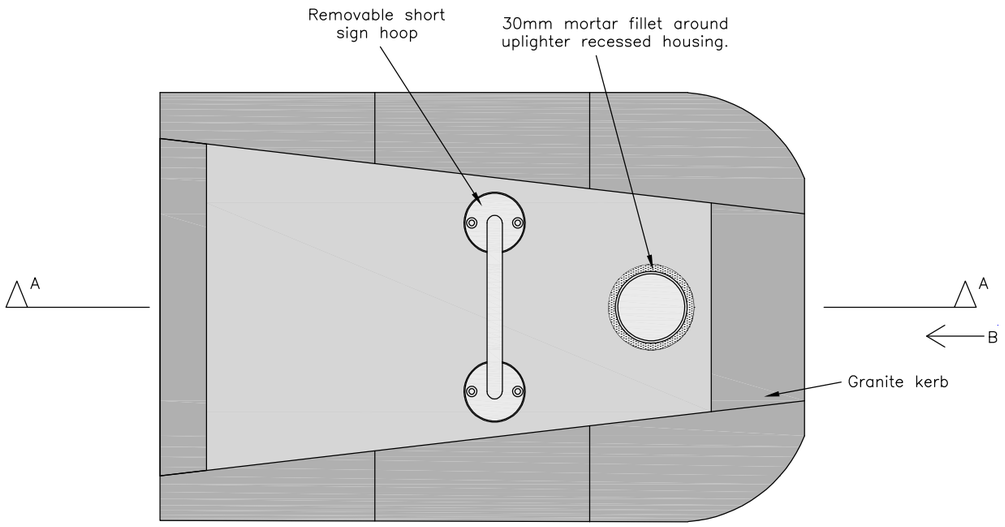
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

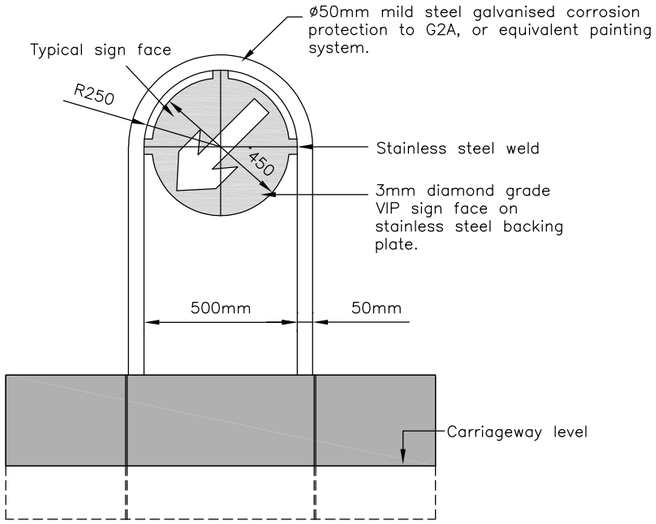
Drawing No. TFL/SG19

Rev 6

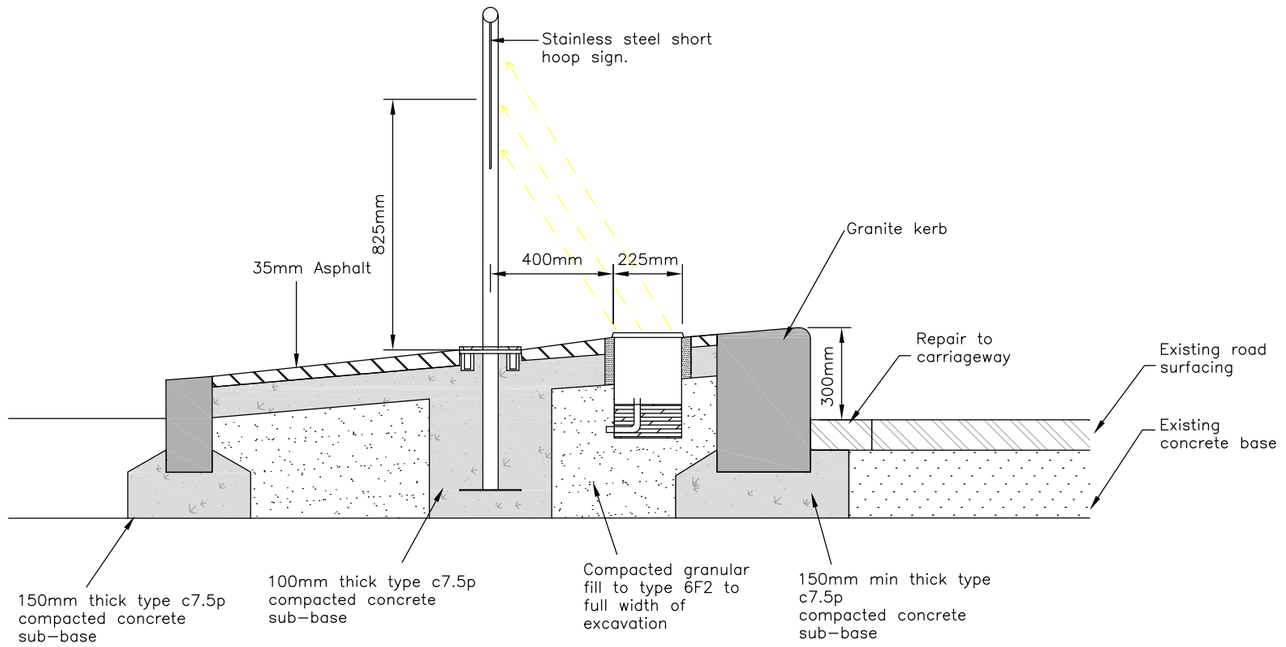
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:20



Elevation B
Scale 1:20



Section A–A
Scale 1:20

Legend

- Asphalt surfacing
- Concrete type c7.5p
- Sub base type 1
- Road base concrete
- Re–laid wearing course

Notes

1. All dimensions in millimetres unless otherwise stated.
2. Uplighter to be fitted with 60° grille and stainless steel bezel.
3. Uplighter to be centred on sign face.
4. Top of surface of stainless steel bezel to be flush with final surface.
5. Uplighter to be 'cool touch'
6. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	18/01/08	MINOR AMENDMENTS	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original issue	RD	IH

Project
Streetscape Guidance

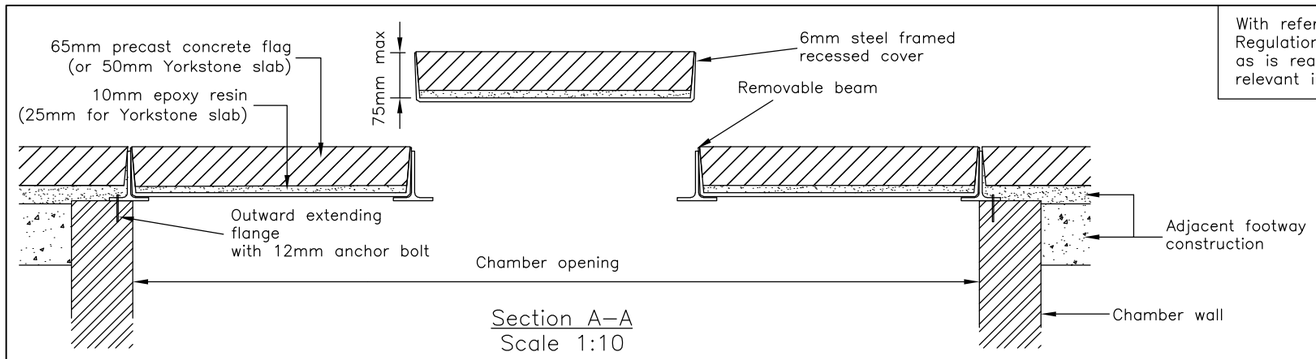
Drawing Title
Uplighter and Keep Left Sign

Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:20	A3

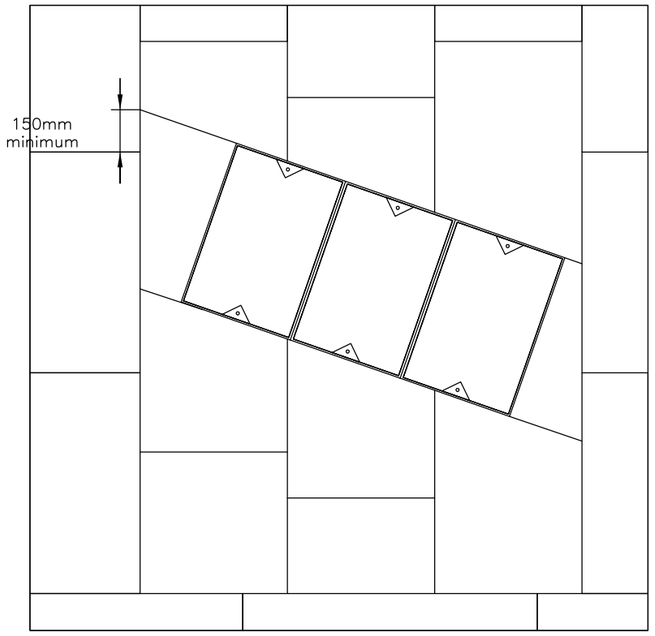
Drawing No.
TFL/SG20

Rev
3

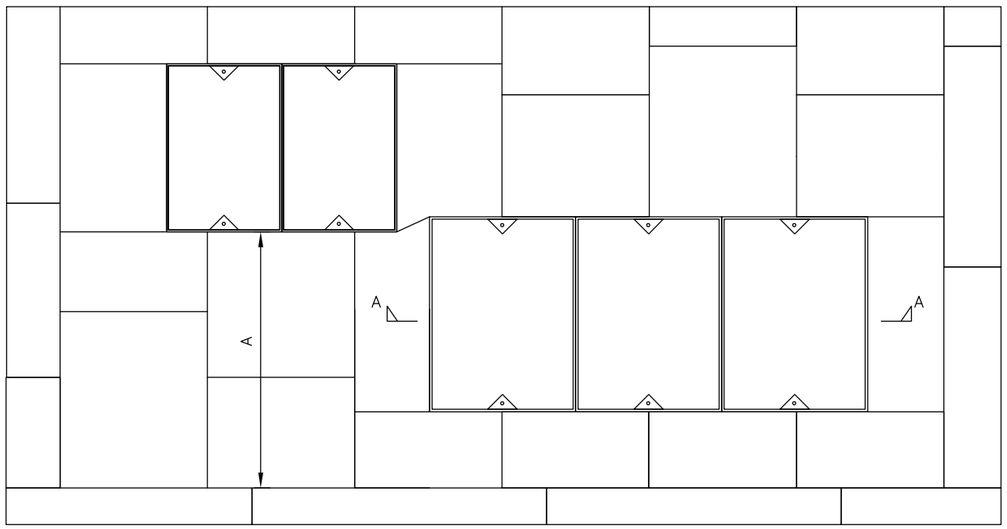


Section A–A
Scale 1:10

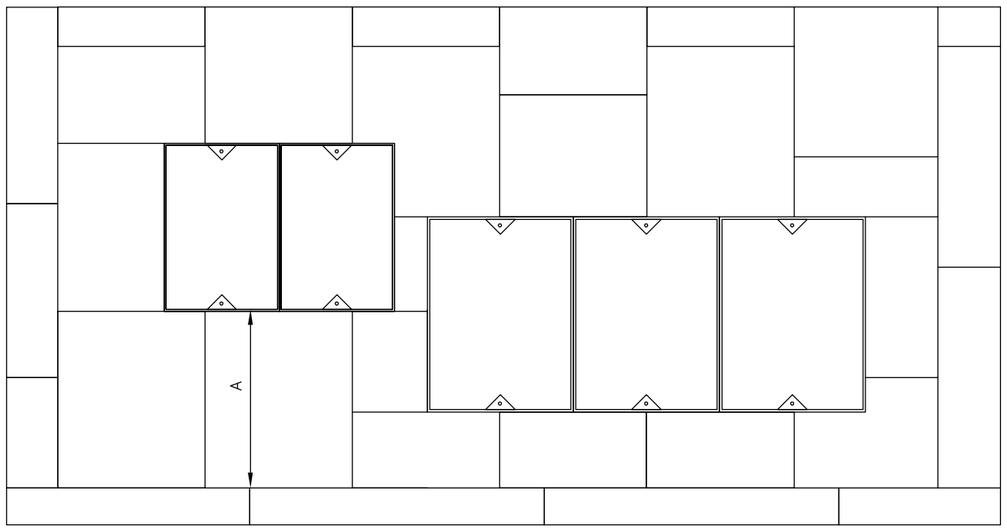
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



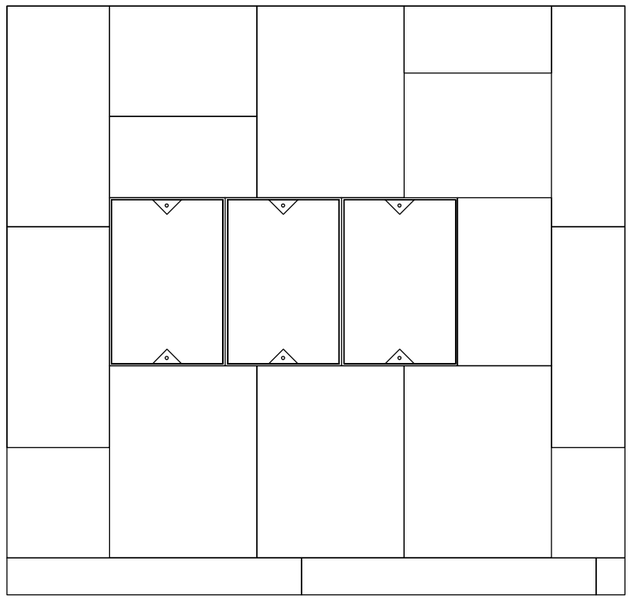
Utility cover not in line with paving
Scale 1:25



Utility cover in–line with paving (A>900mm)
Scale 1:25



Utility cover in–line with paving (A<900mm)
Scale 1:25



Utility cover in–line with paving
Scale 1:25

Notes:

1. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.
2. All frames and covers to be min 6mm thick cast structural steel plate to BS EN 124 formed to required profile and welded using the CO_2 process.
3. All frames and covers to be hot dipped galvanised after manufacture to BS729.
4. Covers should have 2 No. centralised lifting points. One lifting point should be marked with the BSI kitemark, "EN124" and "B125". The cover should comply to these standards. The other lifting point should be marked with the manufacturer's ID and the utility company ID.
5. After brushing in of sand between joints, all covers shall be lifted and sand between the covers and frame removed to ensure future ease of access. The covers shall then be re–fitted.
6. Six sets of lifting keys to be provided to the Engineer.
7. All work must be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).
8. Lifting slots to be sized to suit particular utility company's standard lifting key.

Rev.	Date	Description	Chkd.	App.
4	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
3	19/02/08	MINOR AMENDMENTS	AH	CR
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	02/08/05	CLIENT AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project

Streetscape Guidance

Drawing Title

Infill Cover–
Footway Paving

Drawing Status

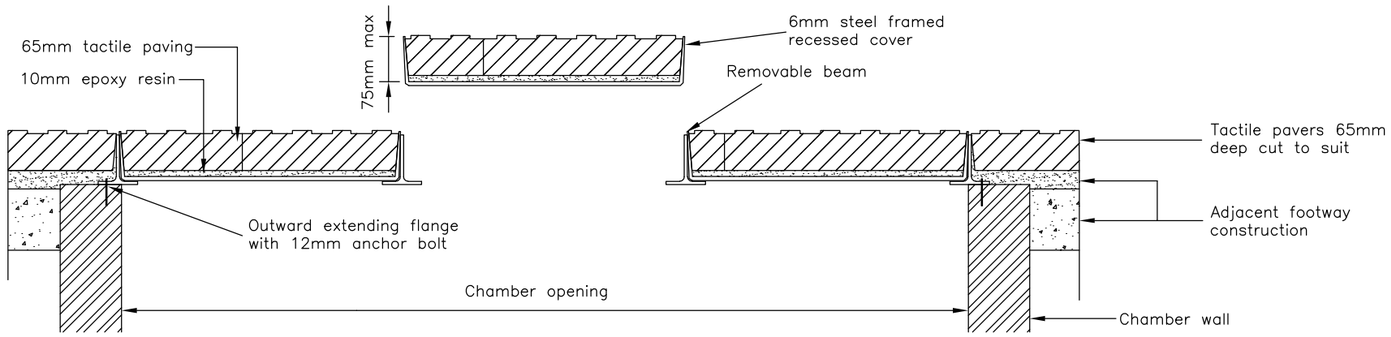
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:25	A3

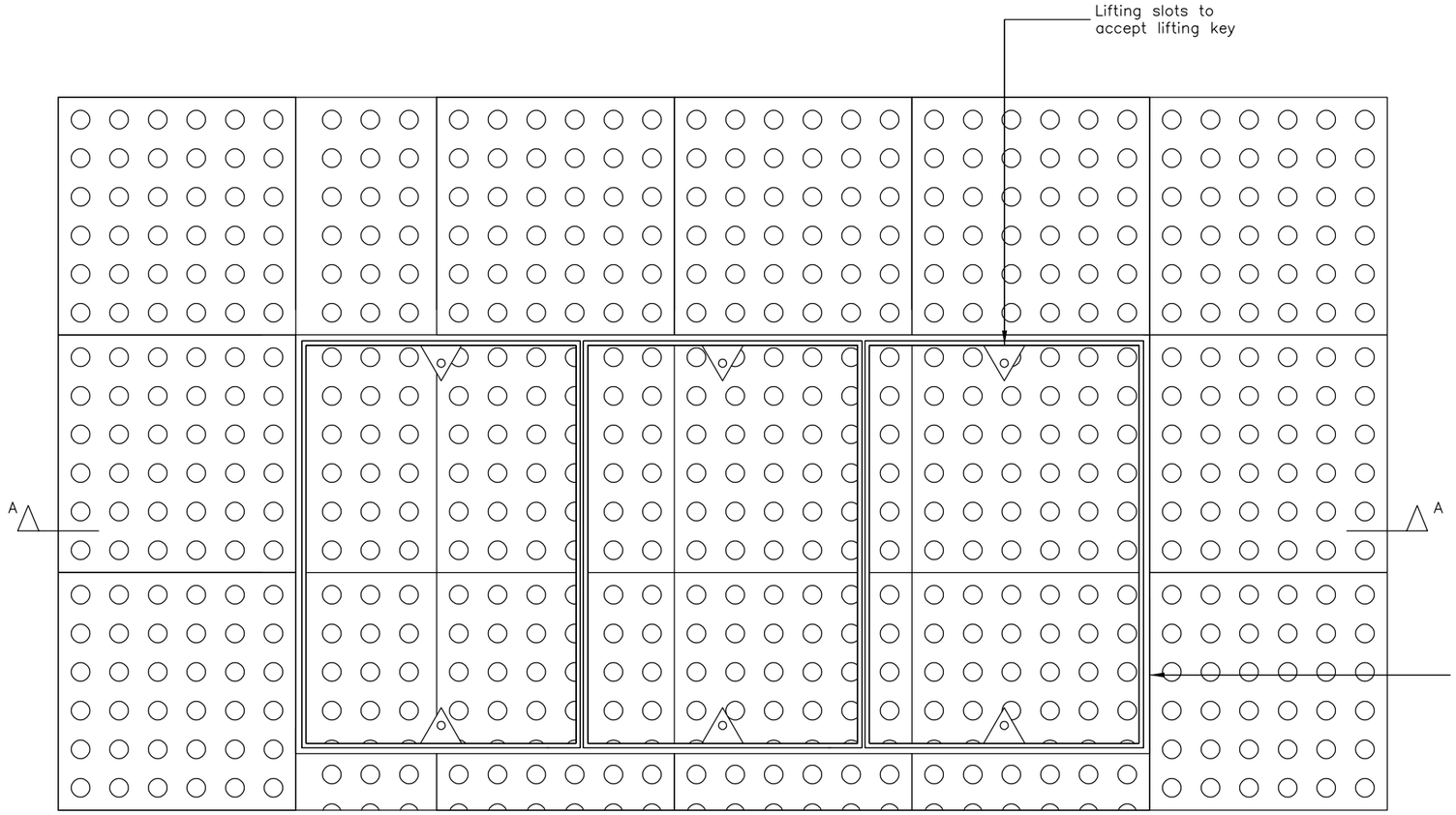
Drawing No.
TFL/SG21

Rev
4

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Section A–A
Scale 1:10



Plan
Scale 1:10

Notes

1. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.
2. All frames and covers to be min. 6mm thick cast structural steel plate to BS EN 124 formed to required profile and welded using CO_2 process.
3. All frames and covers to be hot dipped galvanised after manufacture to BS 729.
4. Covers should have 2 No. centralised lifting points. One lifting point should be marked with BSI kitemark, "EN124" and "B125". The cover should comply to these standards. The other lifting point should be marked with the manufacturers ID and the utility company ID.
5. After brushing in of sand, all covers shall be lifted, and sand between the covers and frame removed to ensure future ease of access. The covers shall then be re–fitted.
6. Six sets of lifting keys to be provided to engineer.
7. Slabs aligned to reduce number of cuts for infill covers.
8. All work must be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).
9. Lifting slots to be sized to suit particular utility company's standard lifting key.

Typical clear opening chamber size	Number of covers	Typical individual cover size
725 x 225	1	785 x 315
915 x 445	2	485 x 505
610 x 610	2	333 x 670
1310 x 610	3	454 x 670
1690 x 710	5	347 x 770
2285 x 710	6	388 x 770

The number of covers on other sized chambers to be compatible with the above table to allow for one man lift of the covers

Legend

Blister paving: concrete modular, 400x400x65mm

Chamber wall

Rev.	Date	Description	Chkd.	App.
5	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	26/03/08	MINOR AMENDMENTS	MDR	CNR
2	19/02/08	MINOR AMENDMENTS	AH	CR
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

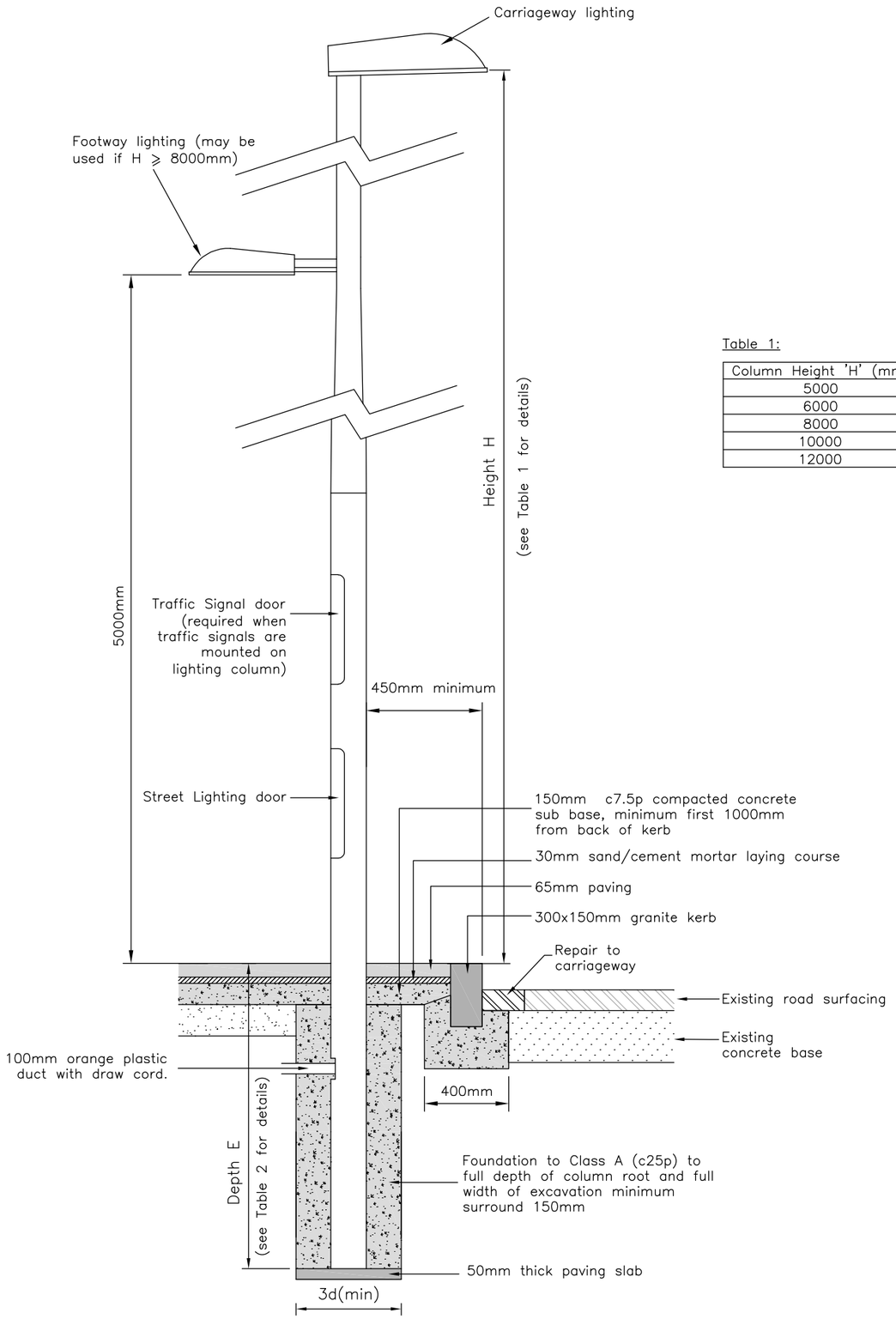
Drawing Title
Infill Cover–
Blister Paving

Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:10	A3

Drawing No.
TFL/SG22

Rev
5



Section
Scale 1:25

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.

Table 1:

	Planting Depth 'E' (mm)		
Column Height 'H' (mm)	G630 Good Soil	G390 Average	G230 Poor Soil
5000	800	1000	1200
6000	800	1000	1200
8000	1000	1200	1500
10000	1200	1500	1700
12000	1500	1700	2000

Soil Type (Factor G) (BS 5649 Part 2)

G630 Good: Compact, well graded sand and gravel, hard clay, well graded fine and course sand, decomposed granite rock and soil. Good material should be well drained and in locations where water will not stand.

G630 Average: Compact fine sand, medium clay, compact, well drained sandy loam, loose course sand and gravel. Average soils should be drained sufficiently well that water does not stand on surface.

G630 Poor: Soft clay, clay loam, poorly compacted sand, clays containing a large amount of silt and vegetable matter, and made ground. Poor soils will normally be wet and have poor drainage.

Notes

1. Distribution Network Operator (DNO) ducts to be black 100mm o/d nominal to DNO energy specification.
2. Street lighting ducts to be 100mm o/d thick walled low or medium density polyethylene with a smooth bore, orange in colour printed 'Street Lighting' in white 9mm high lettering at intervals of not more than one metre.
3. Traffic signal ducts to be 100mm o/d thick walled low or medium density polyethylene with a smooth bore, orange in colour printed 'Traffic Signals' in white 9mm high lettering at intervals of not more than one metre all to TFL specifications
4. A 6mm (nominal) diameter polypropylene draw cord with a 6kN (nominal) breaking strain be provided in each duct extending 1000mm (nominal) beyond the duct ends. Draw cords at foundation end of ducts to be brought to surface.
5. Column to be orientated with compartment doors at 90° to kerb line facing away from direction of traffic flow, or as advised by the Engineer.
6. Refer to Streetscape Guidance Document for the palette of luminaire and post options.
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.

Rev.	Date	Description	Chkd.	App.
6	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
5	19/05/08	MINOR AMENDMENTS	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	07/01/08	MINOR AMENDMENTS	GSV	LD
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	13/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Lighting Column Detail

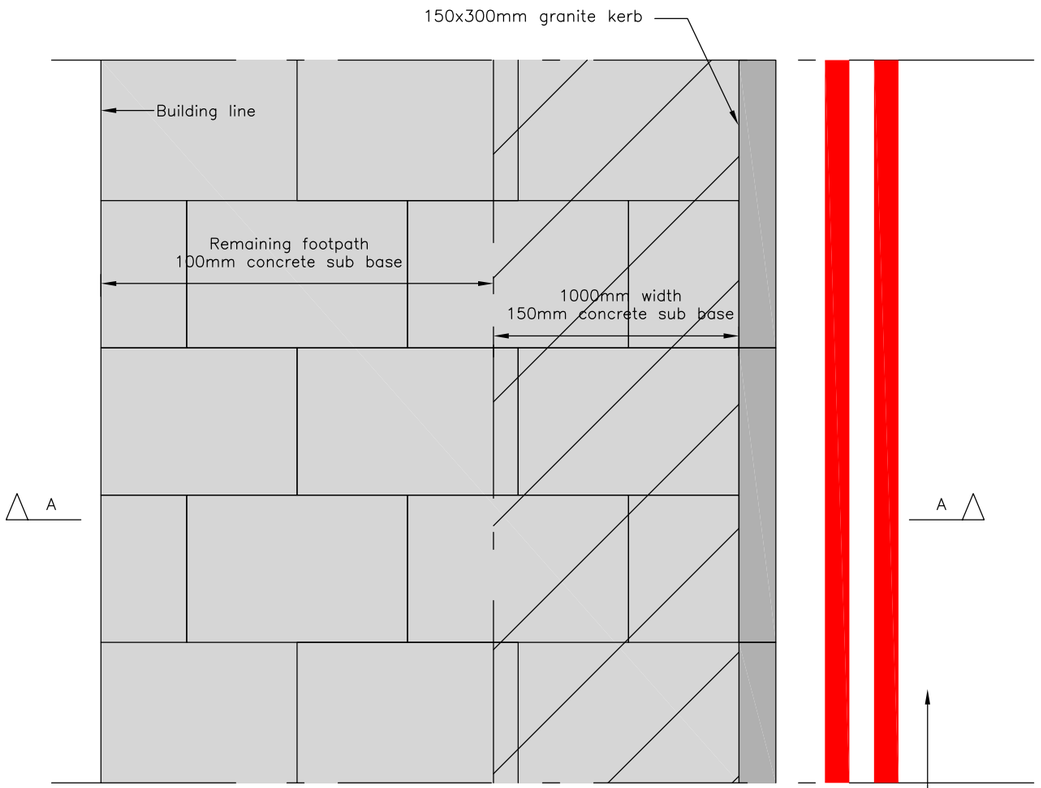
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:25	A3

Drawing No. TFL/SG23

Rev 6

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



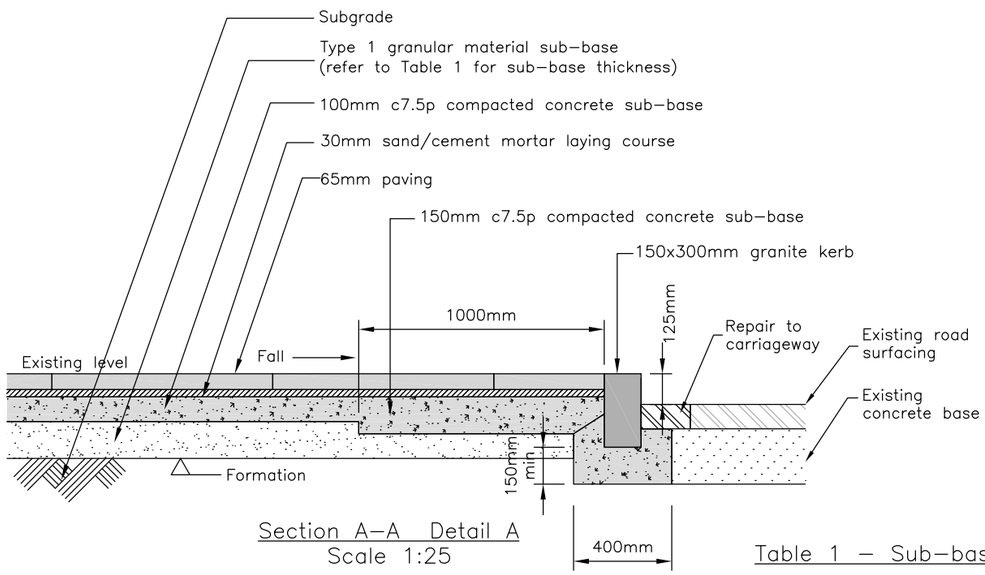
Plan
Scale 1:25

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. The thickness of sub–base material is to be determined by the strength of the subgrade given by the California Bearing Ratio (CBR).
3. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
4. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
5. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
6. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21)
8. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Legend

- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent
- Sand/cement mortar mix
- Concrete type c7.5p
- Sub base type 1
- Re–laid wearing course
- Road base concrete
- Existing sub base

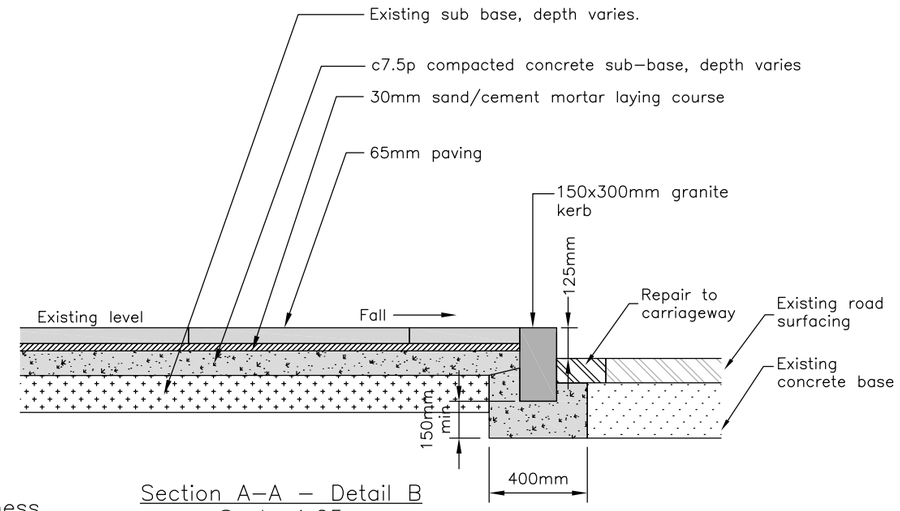


Section A–A Detail A
Scale 1:25

Construction profile where base course depths allow. Refer Note 1.

Table 1 – Sub–base thickness

	Subgrade Strength		
	CBR ⩽2%	CBR ⩽5%	CBR >5%
Sub–base thickness	250mm	200mm	150mm



Section A–A – Detail B
Scale 1:25

Construction profile where base course depths in Detail A cannot be achieved. Refer Note 1.

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	17/03/08	MINOR AMENDMENTS	MDR	CNR
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Paving Construction Details

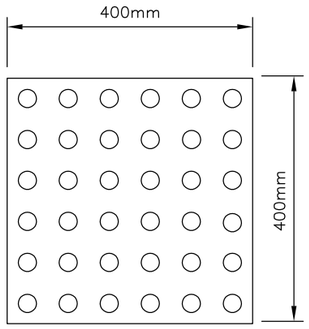
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:25	A3

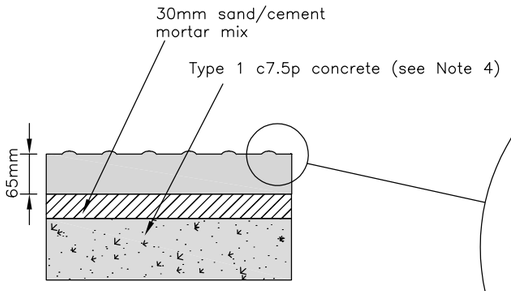
Drawing No. TFL/SG24

Rev 3

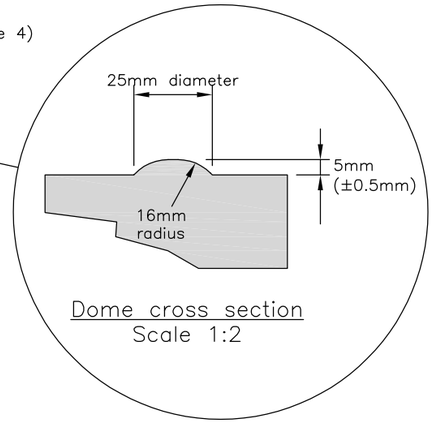
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan



Section



Dome cross section
Scale 1:2

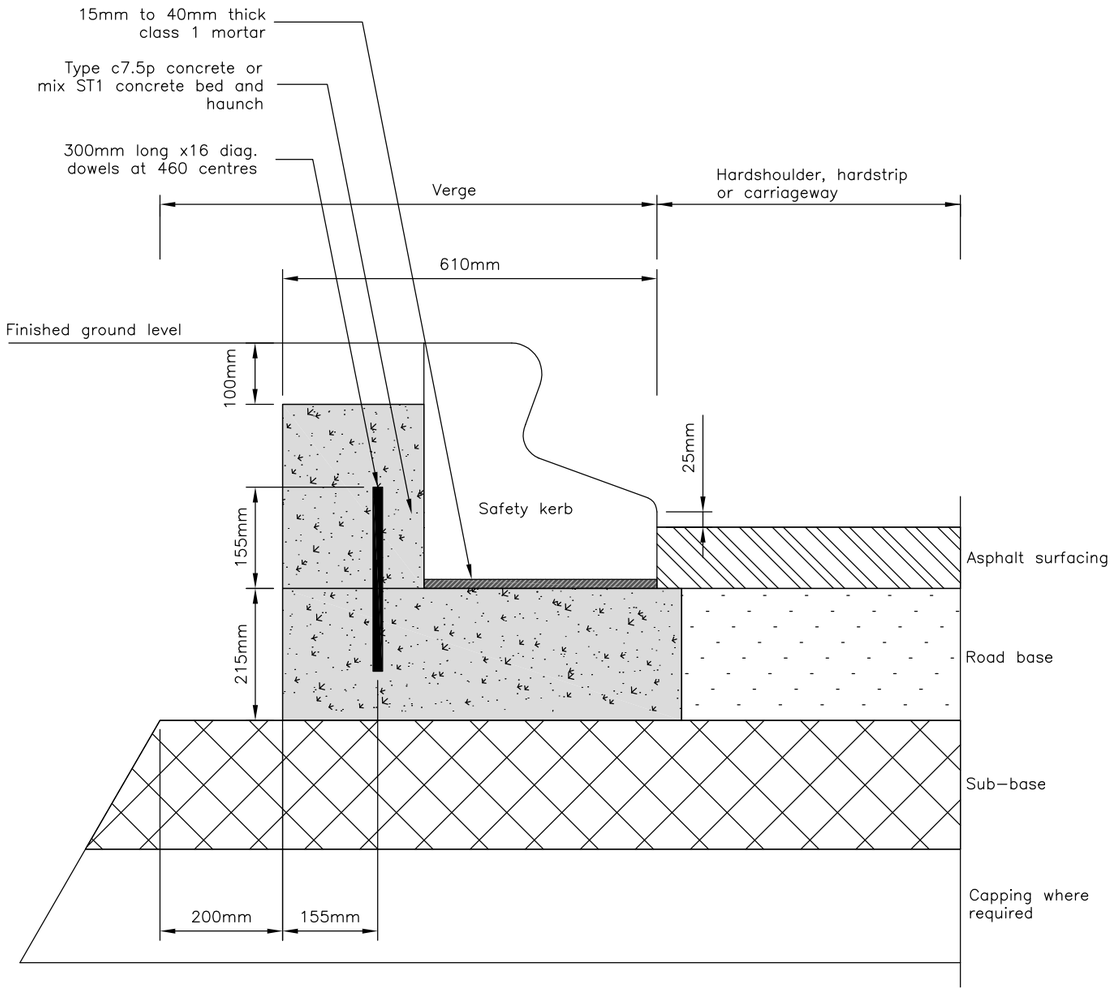
Blister paving
Scale 1:10

Notes

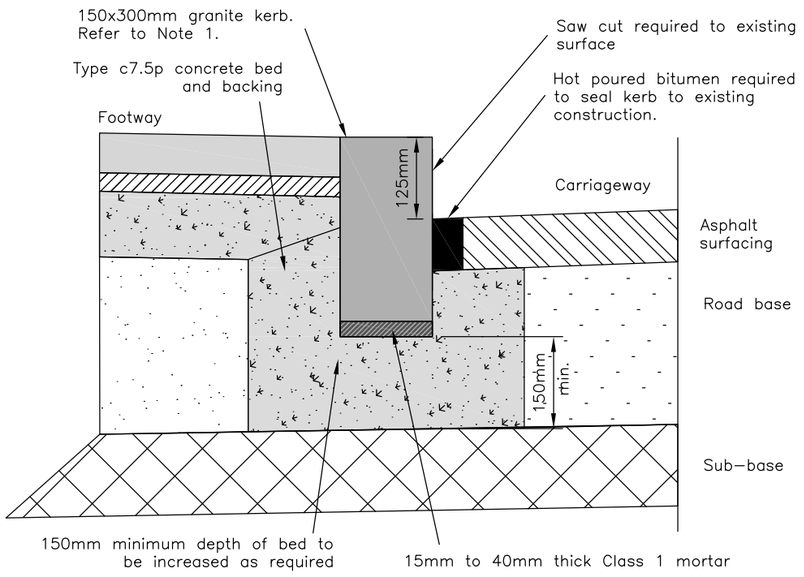
1. Granite kerbs to BS 435:1975. standard kerbs at 1200mm. No kerbs should be more than 1500mm or less than 600mm in length.
2. Precast kerbs to comply with BS 7263 Part 1:1994
3. Existing footway and /or carriageway to be reinstated except where indicated otherwise on the layout drawings.
4. All paving to be laid on a 150mm thick type c7.5p concrete sub base extended 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be bedded on a 100mm thick type c7.5p concrete sub base unless otherwise stated.

Legend

- Sand/cement mortar mix
- Carriageway subbase
- Concrete type c7.5p
- Road base concrete
- Sub base type 1
- Asphalt surfacing



Safety kerb
Scale 1:10



Granite Kerb
Scale 1:10

Rev.	Date	Description	Chkd.	App.
4	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
3	01/04/08	MINOR AMENDMENTS	MDR	CNR
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	07/04/05	Client amendments	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Kerb and Blister Paving Construction Details

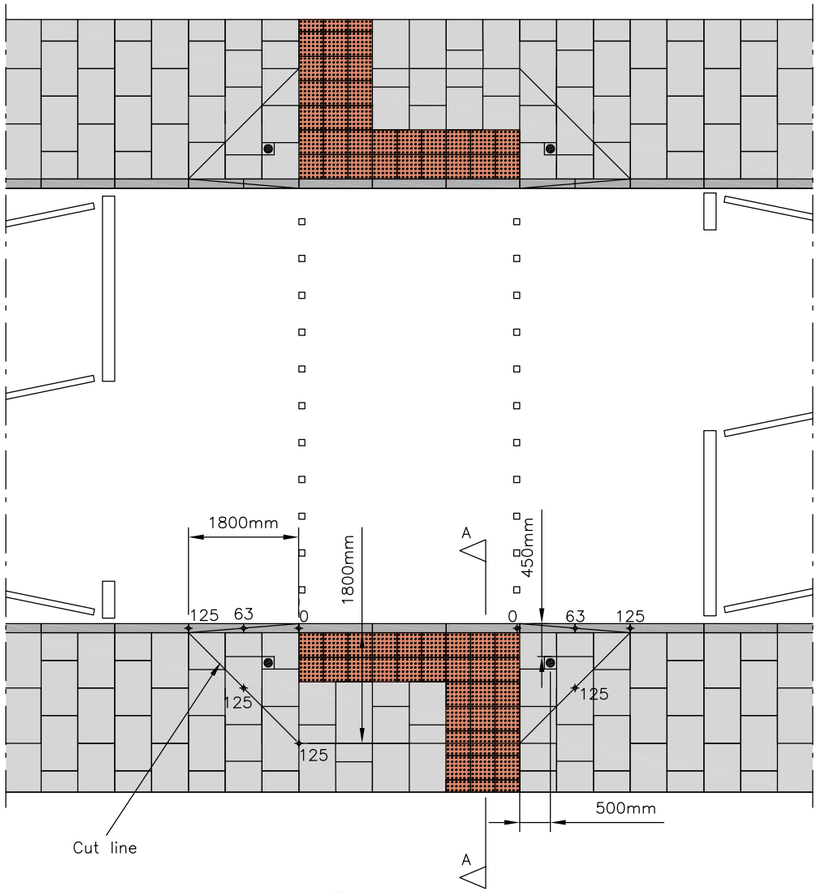
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

Drawing No. TFL/SG25

Rev 4

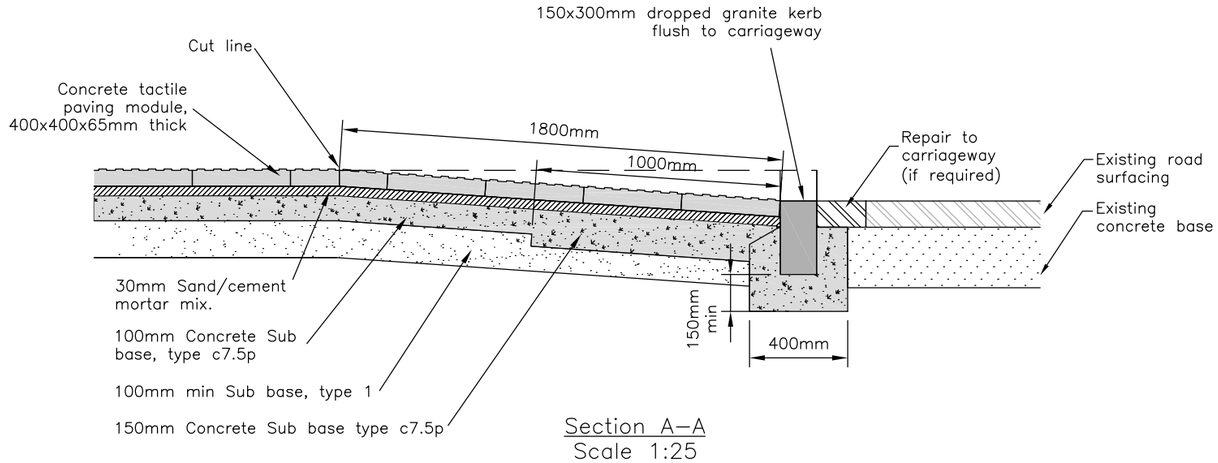
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:100

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Granite kerb dropped over approximately 1800mm to provide a flush fine picked silver grey kerb (0mm upstand) over crossing width.
7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
8. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).



Section A–A
Scale 1:25

Legend

- Red blister paving: concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Dropper granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent
- Sand/cement mortar mix
- Concrete type c7.5p
- Sub base type 1
- Road base concrete
- Re–laid wearing course
- Signal pole/pushbutton
- ✦6 Height above carriageway

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	18/01/08	MINOR AMENDMENTS	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Dropped Kerb with Tactile Paving–
Construction Details

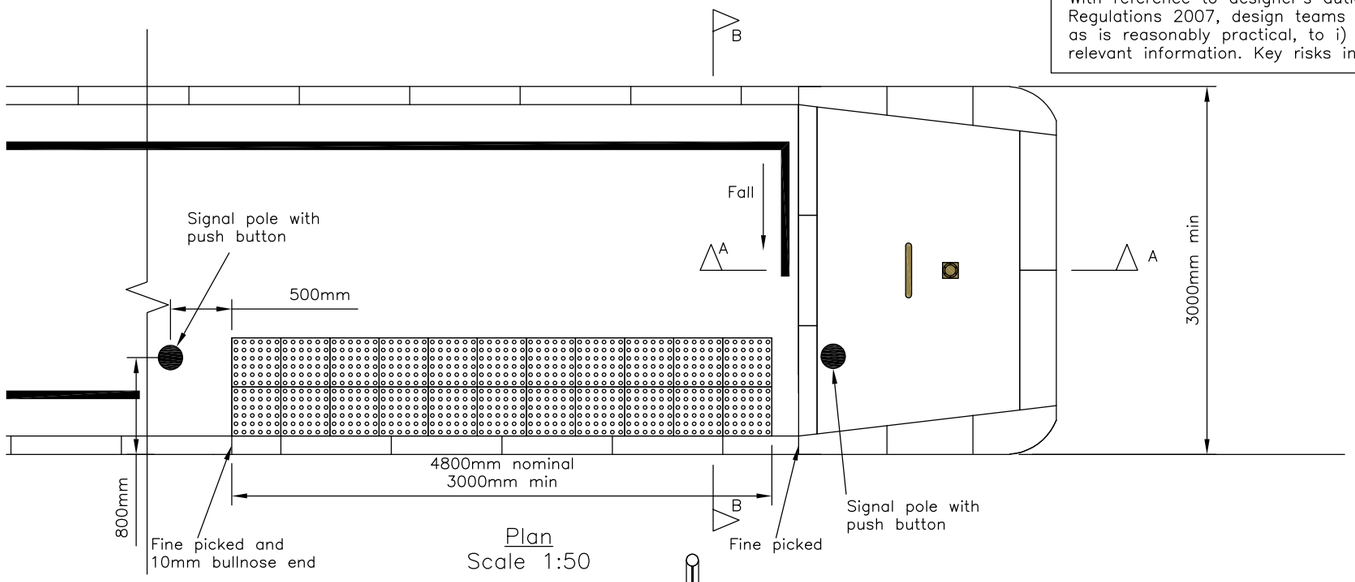
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

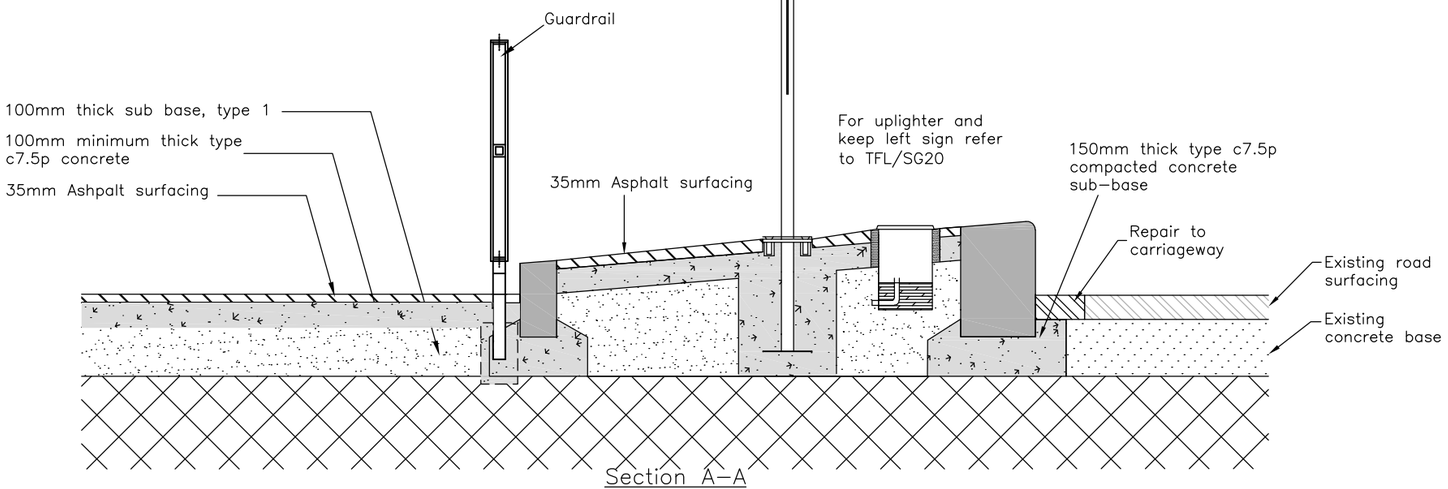
Drawing No. TFL/SG26

Rev 3

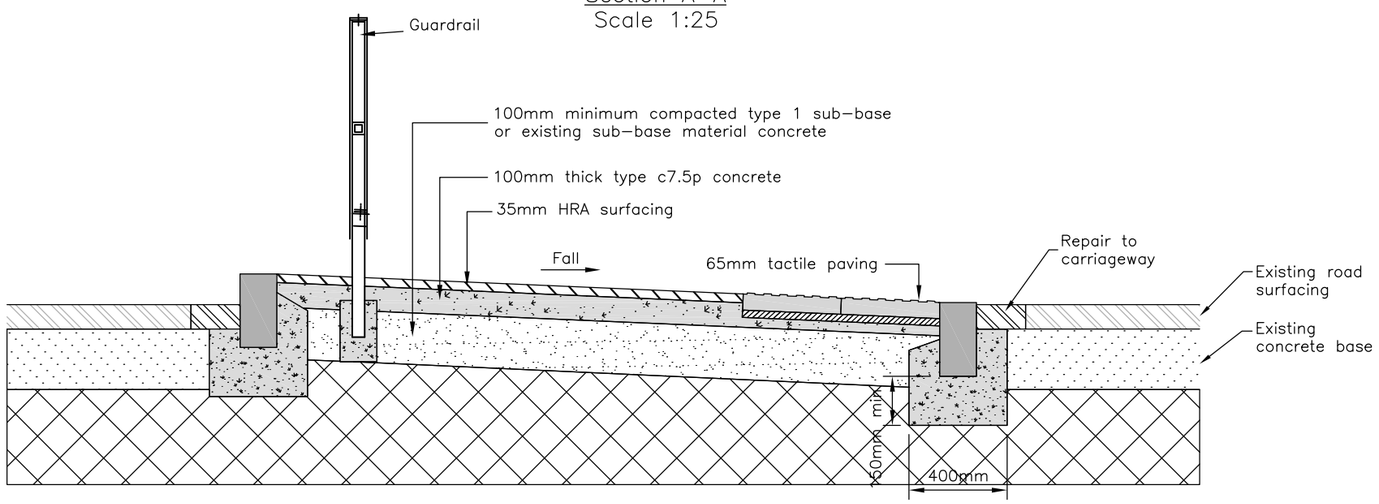
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:50



Section A–A
Scale 1:25



Section B–B
Scale 1:25

Legend

- Red blister paving: concrete modular, 400x400x65mm
- Sand/cement mortar mix
- Asphalt surfacing
- Concrete type c7.5p
- Sub base type 1
- Carriageway subbase
- Road surfacing
- Road base concrete

Rev.	Date	Description	Chkd.	App.
6	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
5	19/05/08	MINOR AMENDMENTS	MDR	CNR
4	02/04/08	MINOR AMENDMENTS	MDR	CNR
3	18/01/08	MINOR AMENDMENTS	GSV	LD
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	07/04/05	Client amendments	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Pedestrian Refuge Island
–Construction Details

Drawing Status
GUIDANCE ISSUE No 2

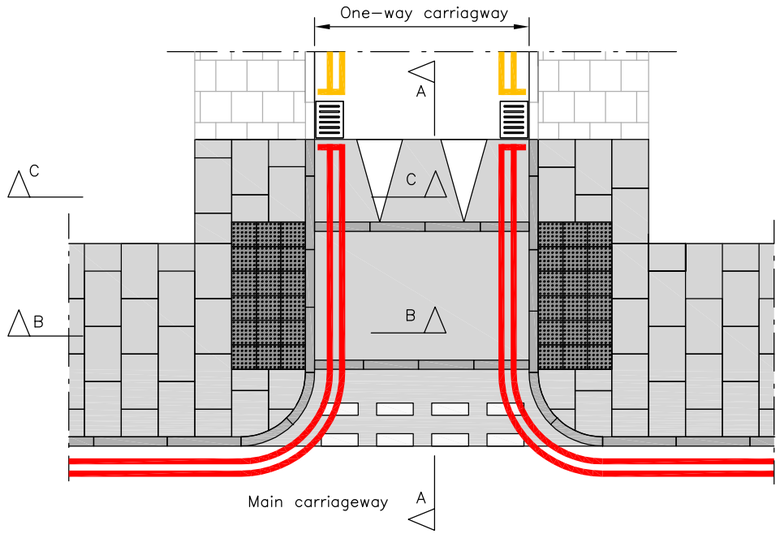
Drawn	Designed	Scale	Size
PCL	TFL	As shown	A3

Drawing No. TFL/SG27

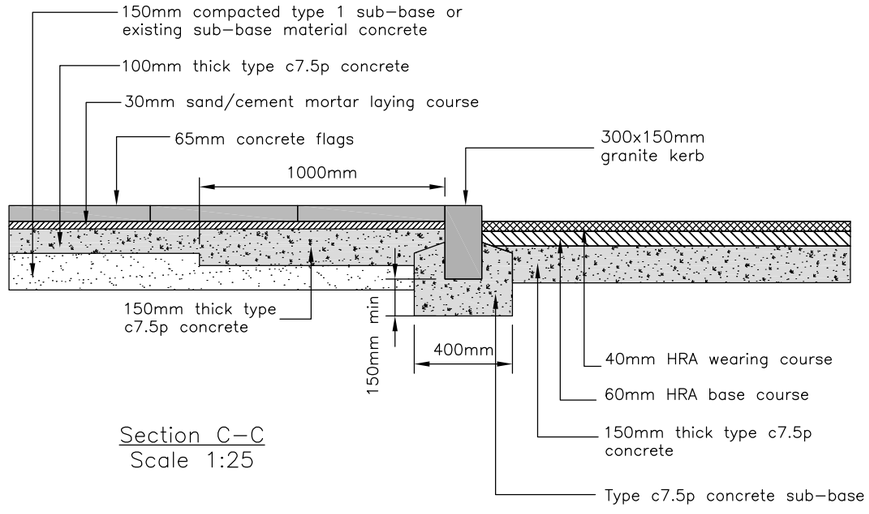
Rev 6

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.

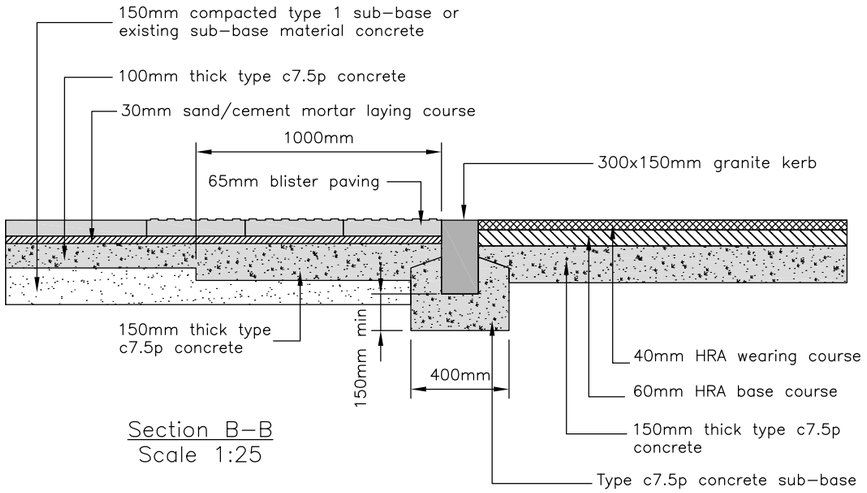
Refer to drawing TFL/SG09
for layout details



Plan
Scale 1:100

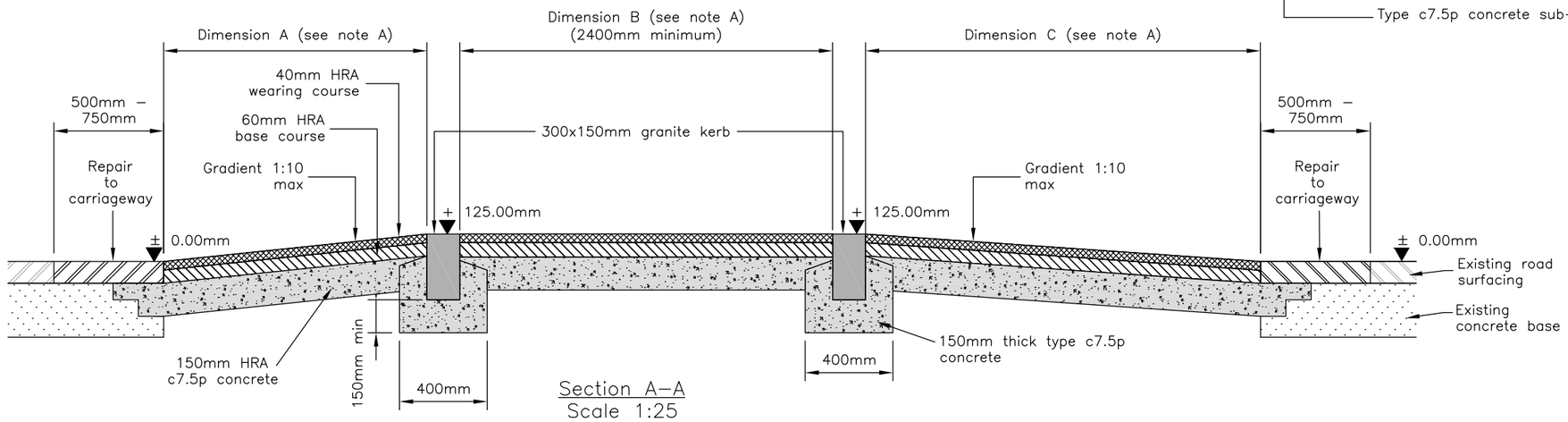


Section C-C
Scale 1:25



Section B-B
Scale 1:25

Note A
The length of dimension A,B,C varies depending on site levels footway widths and corner radii



Section A-A
Scale 1:25

Legend

- Charcoal grey blister paving: concrete modular, 400x400x65mm
- Asphalt surfacing
- 150mm Granite kerb, fine picked
- Existing footway
- Concrete flag, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent
- Sand/cement mortar mix
- Sharp sand
- HRA base course
- Concrete type c7.5p
- Sub base type 1
- HRA wearing course

Rev.	Date	Description	Chkd.	App.
4	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
3	01/04/08	MINOR AMENDMENTS	MDR	CNR
2	10/08/05	GUIDANCE ISSUE No 1	SK	RD
1	10/06/05	MINOR AMENDMENTS	RD	IH
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

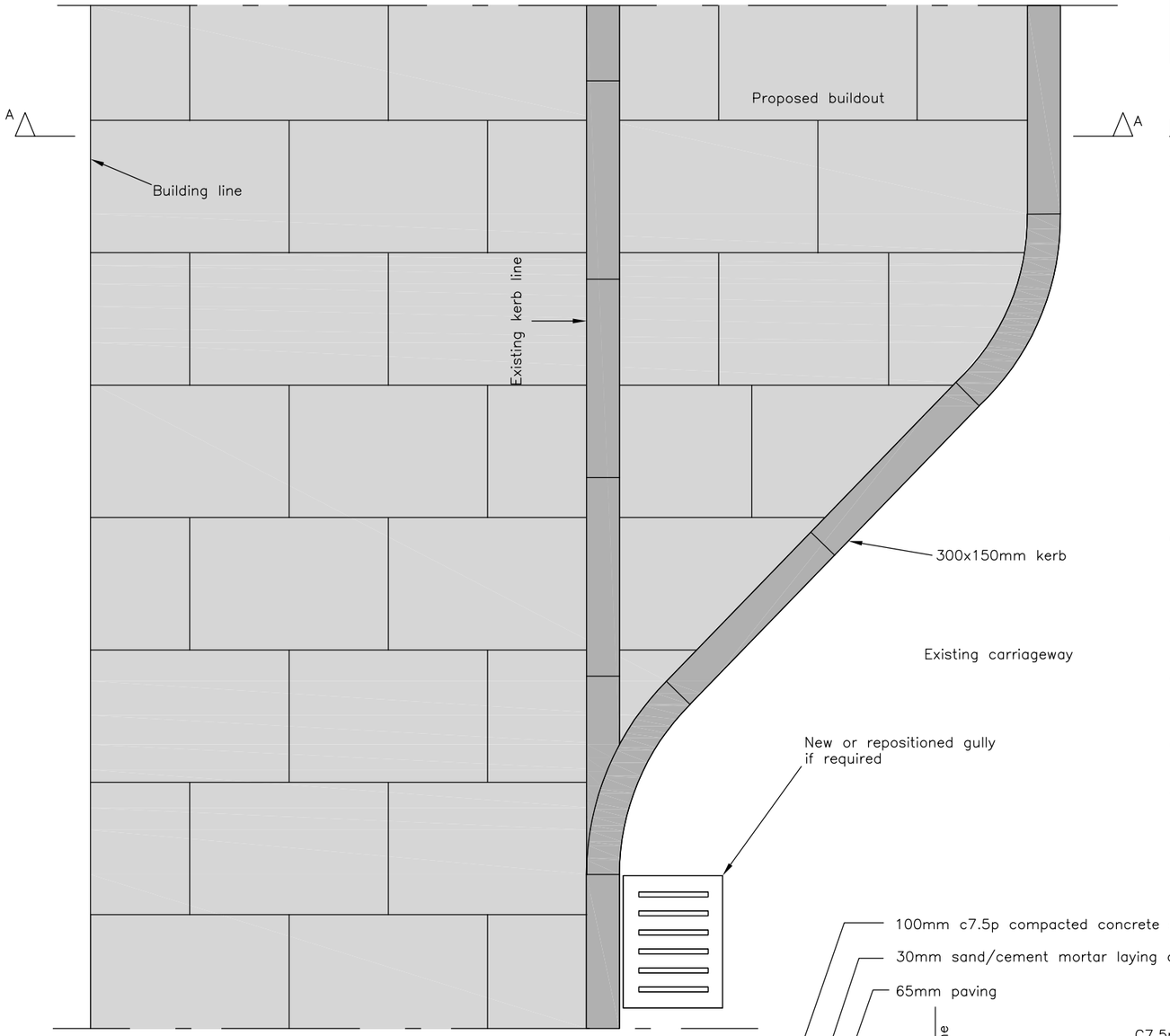
Drawing Title
Side Road Entry Treatment– Construction Details

Drawing Status
GUIDANCE ISSUE No 2

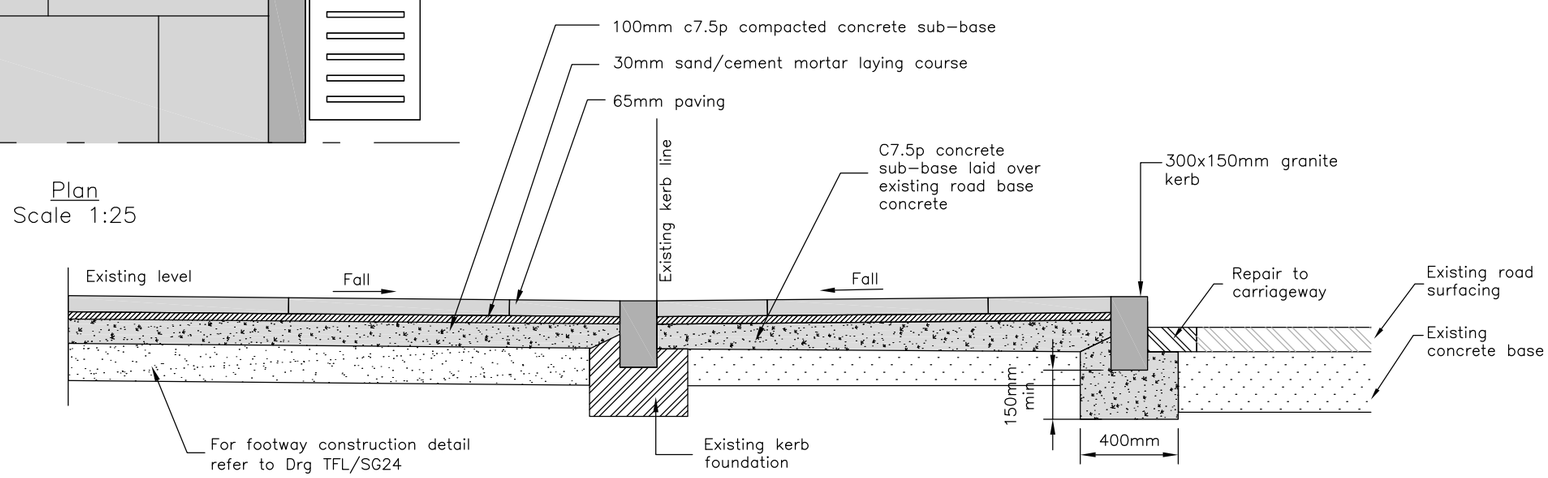
Drawn	Designed	Scale	Size
PCL	TFL	As Shown	A3

Drawing No.
TFL/SG28

Rev
4



Plan
Scale 1:25



Section A–A
Scale 1:25

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).
9. New kerb line to be laid at an angle no more than 45° to existing kerb line.
10. If drainage is not required remove existing kerb. New concrete flags to be laid matching existing overlap bond to new kerb.

Legend

- 150mm Granite, fine picked kerb
- Concrete flag, nominally 900x600x65mm
- Sand/cement mortar mix
- Concrete type c7.5p
- Sub base type 1
- Re–laid wearing course
- Road base concrete

Rev.	Date	Description	Chkd.	App.
4	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
3	02/04/08	MINOR AMENDMENTS	MDR	CNR
2	18/01/08	MINOR AMENDMENTS	GSV	LD
1	10/08/05	GUIDANCE ISSUE No 1	SK	RD
0	25/02/05	Original Issue	RD	IH

STREETS

Project
Streetscape Guidance

Drawing Title
Footway Buildout–
Construction Details

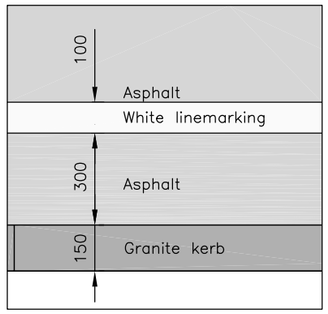
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
PCL	TFL	1:25	A3

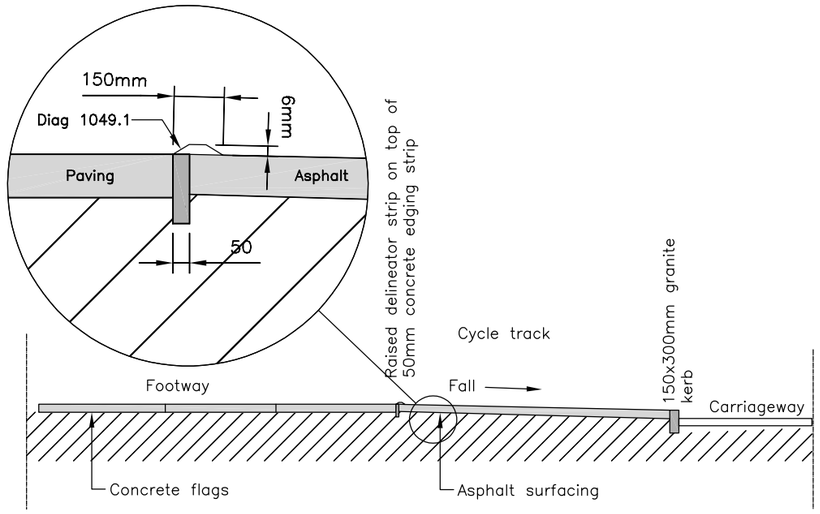
Drawing No. TFL/SG29

Rev 4

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Detail B
Scale 1:20



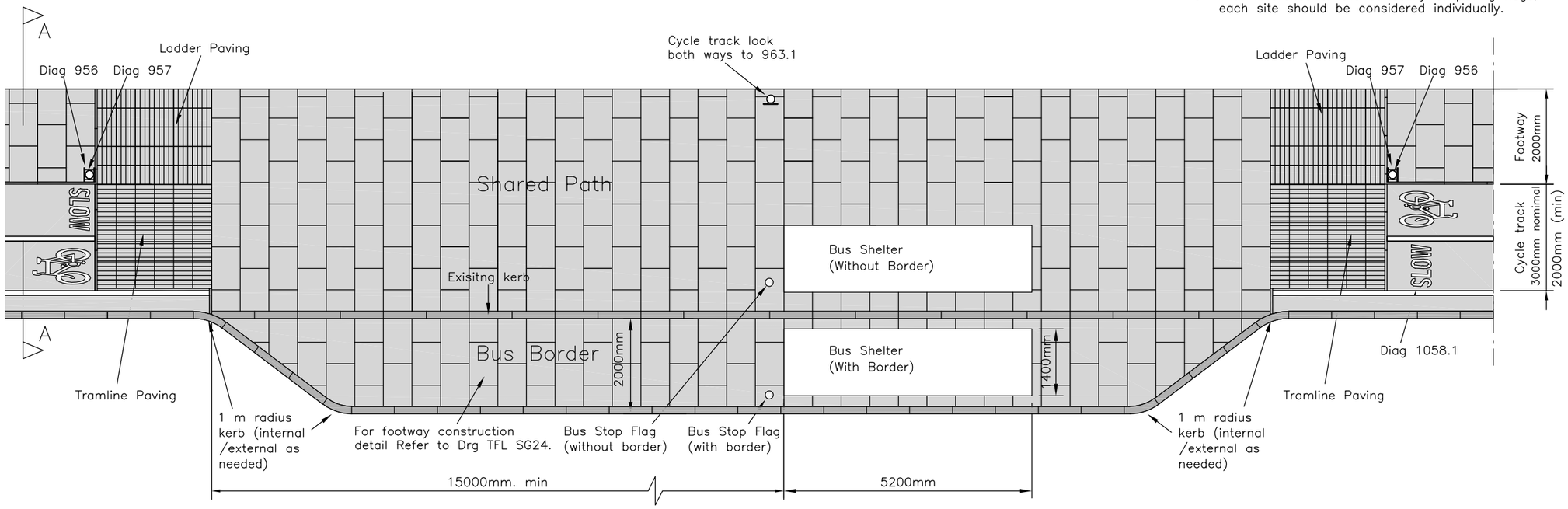
Section A
Scale 1:20

Notes

1. All paving to be laid on a 150mm thick type c7.5p concrete sub base extending 1000mm from back of kerb unless otherwise specified. The remaining area of footway to be laid on 100mm thick type c7.5p concrete sub base unless otherwise stated. All concrete flags and tactile paving to be bedded on a 30mm sand/cement mortar mix, butt jointed, with dry sand brushed into joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
3. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
4. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
5. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
6. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21 & SG22)
7. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
8. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).
9. With reference to the suitability of paving flags, each site should be considered individually.

Legend

- Ladder paving, colour to match concrete flags, : concrete modular, 400x400x65mm
- Tramline paving, colour to match asphalt, : concrete modular, 400x400x65mm
- 150mm Granite kerb, fine picked
- Concrete flag, nominally 900x600x65mm
- Asphalt surfacing



Plan
Scale 1:100

Rev.	Date	Description	Chkd.	App.
2	30/06/08	GUIDANCE ISSUE No 2	MDR	CNR
1	02/04/08	MINOR AMENDMENTS	MDR	CNR
0	18/01/08	ORIGINAL ISSUE	NH	CR

Project
StreetScape Guidance

Drawing Title
Segregated / Shared Route at Bus Stop
(With and Without Bus Border)

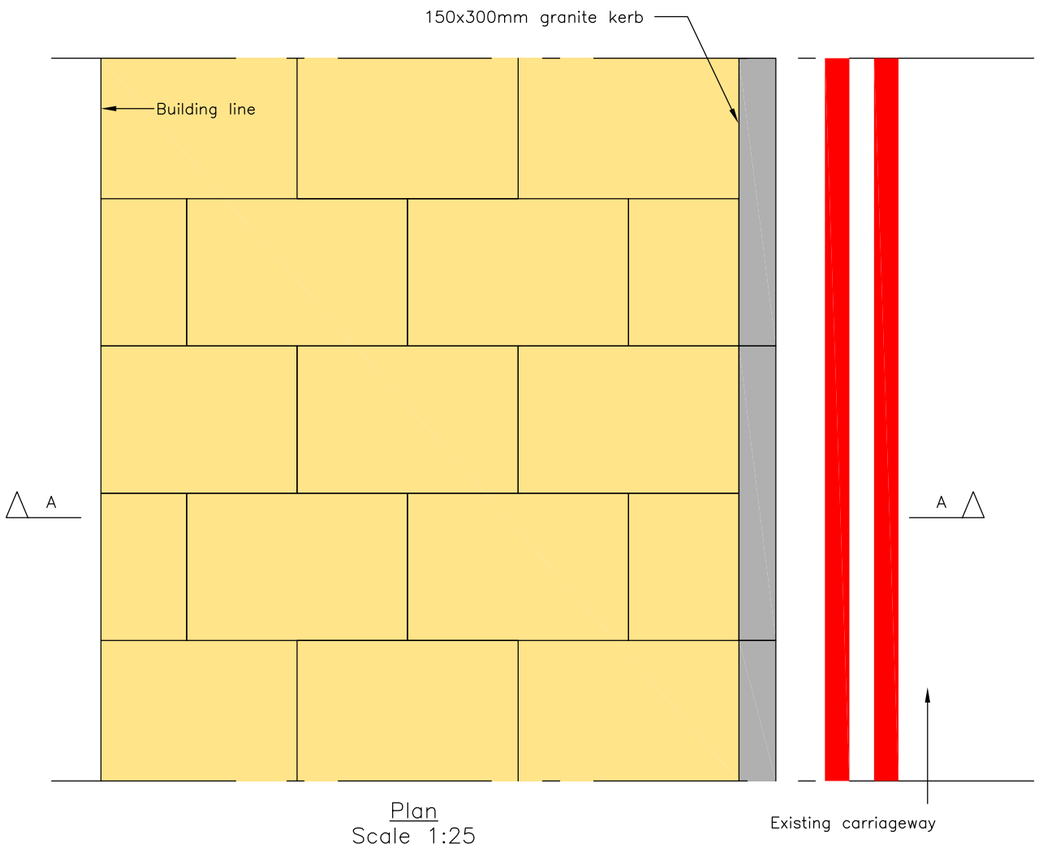
Drawing Status
Guidance Issue No 2

Drawn	Designed	Scale	Size
CNR	TFL	As Shown	A3

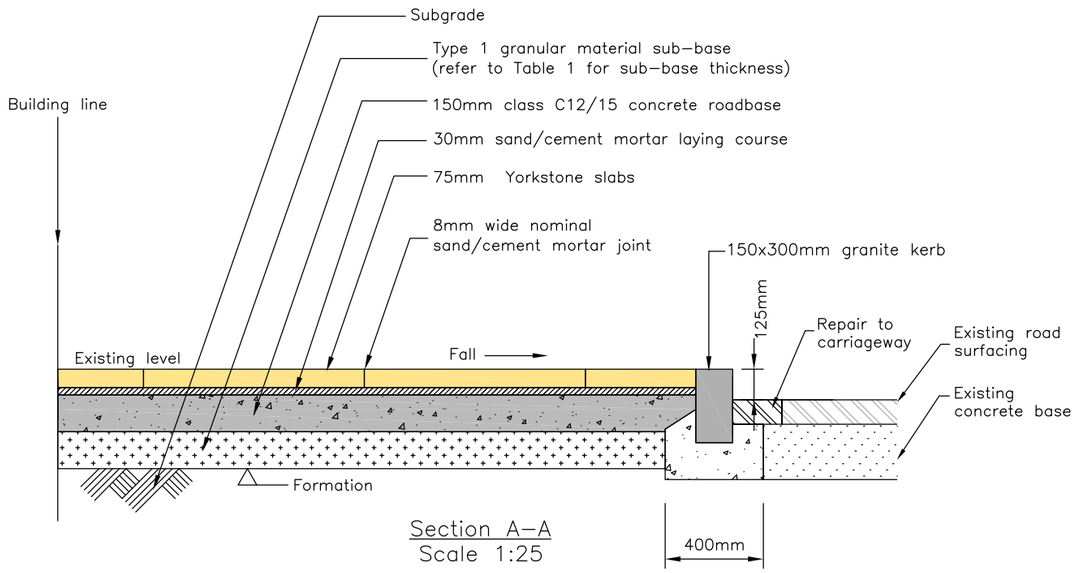
Drawing No. TFL/SG30

Rev 2

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:25



Section A-A
Scale 1:25

Notes

1. All Yorkstone slabs to be laid on a 150mm thick type C12/15 concrete roadbase extending from back of kerb unless otherwise specified. All Yorkstone slabs to be bedded on a 30mm sand/cement mortar laying course and pointed with 8mm wide (nominal) sand/cement mortar joints. The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. The thickness of sub-base material is to be determined by the strength of the subgrade given by the California Bearing Ratio (CBR).
3. Yorkstone slabs to BS EN 1341, minimum density 2500 kg/m³ & minimum compressive strength = 78 N/mm². Yorkstone slabs to be sawn and laid in accordance with BS 7533 Part 4.
4. Yorkstone slabs to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
5. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
6. Yorkstone slabs should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
7. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
8. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21)
9. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
10. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Table 1 – Sub-base thickness

	Subgrade Strength		
	CBR ⩽2%	CBR ⩽5%	CBR >5%
Sub-base thickness	250mm	200mm	150mm

Legend

- 150mm Granite kerb, fine picked
- Yorkstone slab, nominally 900x600x75mm
- Road markings in thermoplastic screed or equivalent
- Sand/cement mortar laying course
- Class C12/15 concrete roadbase
- Type 1 granular material sub-base
- Re-laid surface course

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	11/03/08	MINOR AMENDMENTS	AH	CNR
1	06/03/08	MINOR AMENDMENTS	MDR	CNR
0	19/02/08	Original Issue	AH	CR

STREETS

Project
Streetscape Guidance

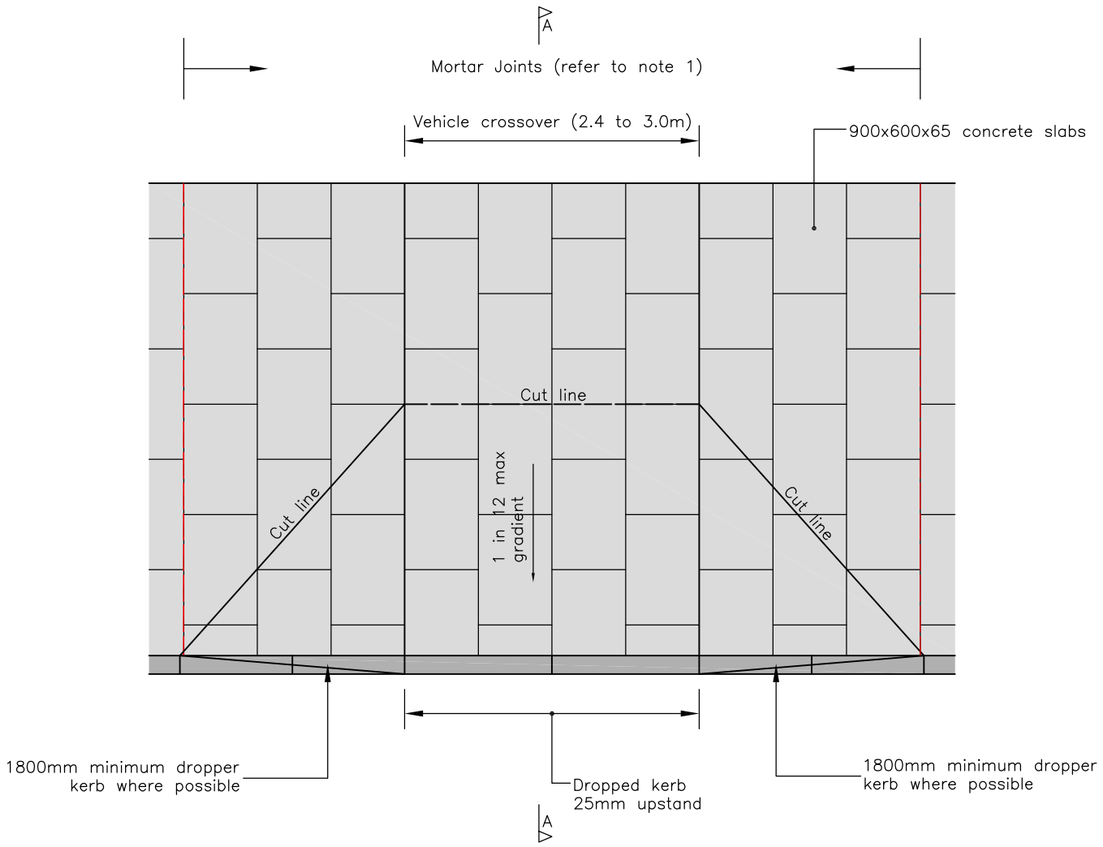
Drawing Title
Footway Construction Details
(Yorkstone Slabs)

Drawing Status
GUIDANCE ISSUE No 2

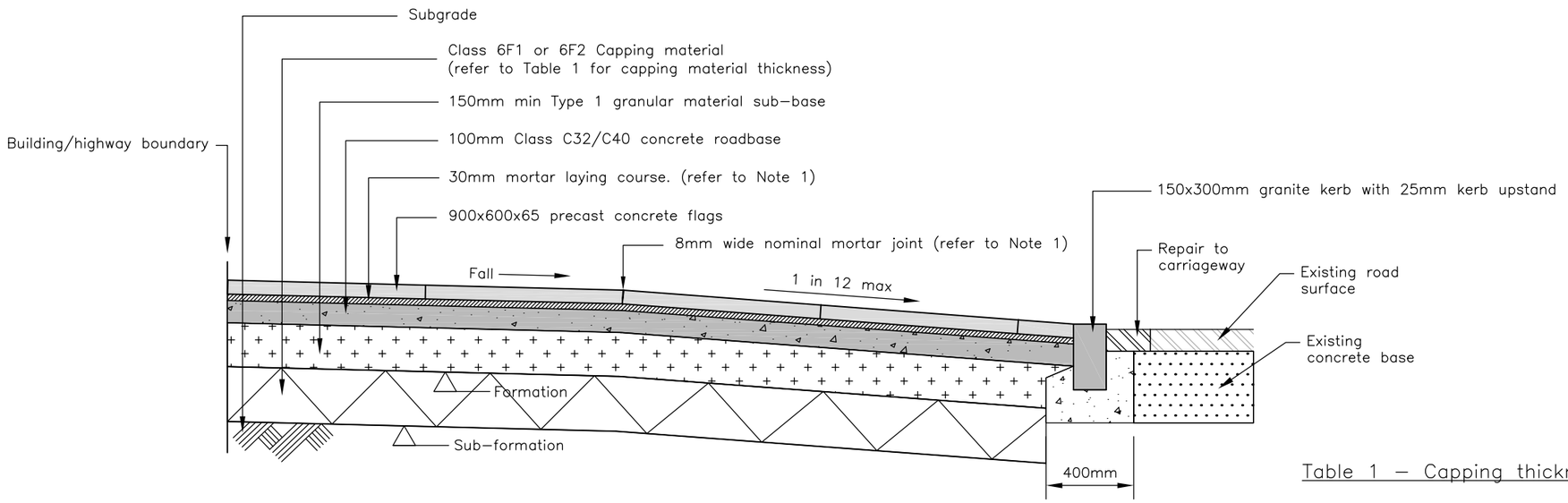
Drawn	Designed	Scale	Size
CNR	TFL	1:25	A3

Drawing No. TFL/SG31

Rev 3



Plan
Scale 1:50



Section A–A
Scale 1:25

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk iii) provide relevant information. Key risks include manual handling and dust inhalation.

Notes

1. All paving to be laid on a 100mm thick class C32/C40 concrete roadbase. All concrete flags to be bedded on a 30mm mortar laying course (Min compresive strength = 30N/mm², Min adhesive strength = 2.0N/mm².) with 8mm mortar joints (Min compresive strength = 40N/mm², Min adhesive strength = 1.5N/mm²). The Resident Engineer should be advised where the preferred depth of construction cannot be achieved on site.
2. The thickness of capping material is to be determined by the strength of the subgrade given by the California Bearing Ratio (CBR).
3. Concrete flags to be laid with courses set at 90° to kerb and a minimum overlap bond of 150mm.
4. The bonding of paving to be cut around utility service covers unless directed by the Resident Engineer.
5. Concrete flags should not be cut so that a width less than 300mm remains. Previous courses should be cut to distribute evenly over width.
6. Granite kerbs to be fine picked 150mm x 300mm x 900–1200mm long. Standard kerb height to be 125mm above carriageway.
7. Existing utility service covers in paved areas to be replaced with recessed covers and infilled with matching paving. Covers to be adjusted to suit on site as directed by the Resident Engineer. (Ref Dwgs TFL/SG21)
8. Lateral clearance to all street furniture to be 450mm minimum from face of kerb.
9. All work to be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

Table 1 – Capping thickness

	Subgrade strength			
	CBR ≤2.5%	CBR 2.5–5%	CBR >5%	CBR ≥15%
Capping thickness	450mm	400mm	250mm	0mm

Legend

- 150mm Granite kerb, fine picked
- Precast concrete flags, nominally 900x600x65mm
- Road markings in thermoplastic screed or equivalent
- Sand/cement mortar laying course
- Class C32/40 concrete roadbase
- Type 1 granular material sub–base
- Re–laid surface course
- Class 6F1 OR 6F2 material capping
- Limit of mortar joints

Rev.	Date	Description	Chkd.	App.
3	02/04/08	GUIDANCE ISSUE No 2	MDR	CNR
2	11/03/08	MINOR AMENDMENTS	AH	CNR
1	06/03/08	MINOR AMENDMENTS	MDR	CNR
0	19/02/08	FIRST ISSUE	AH	CR

STREETS

Project
Streetscape Guidance

Drawing Title
Domestic Vehicle Crossover (in paved footway)

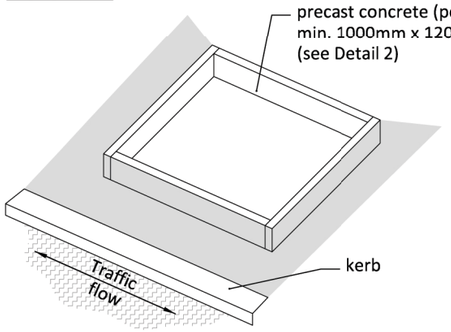
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
CNR	TFL	See drg	A3

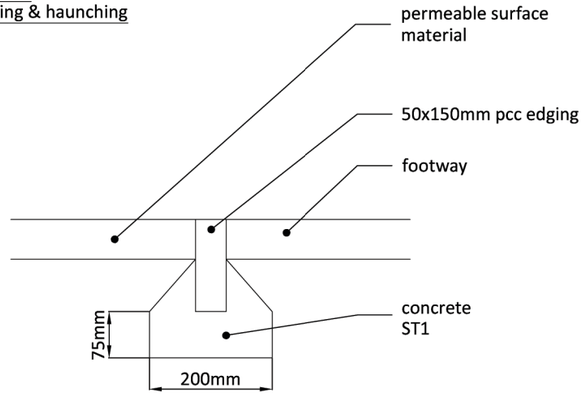
Drawing No. TFL/SG32

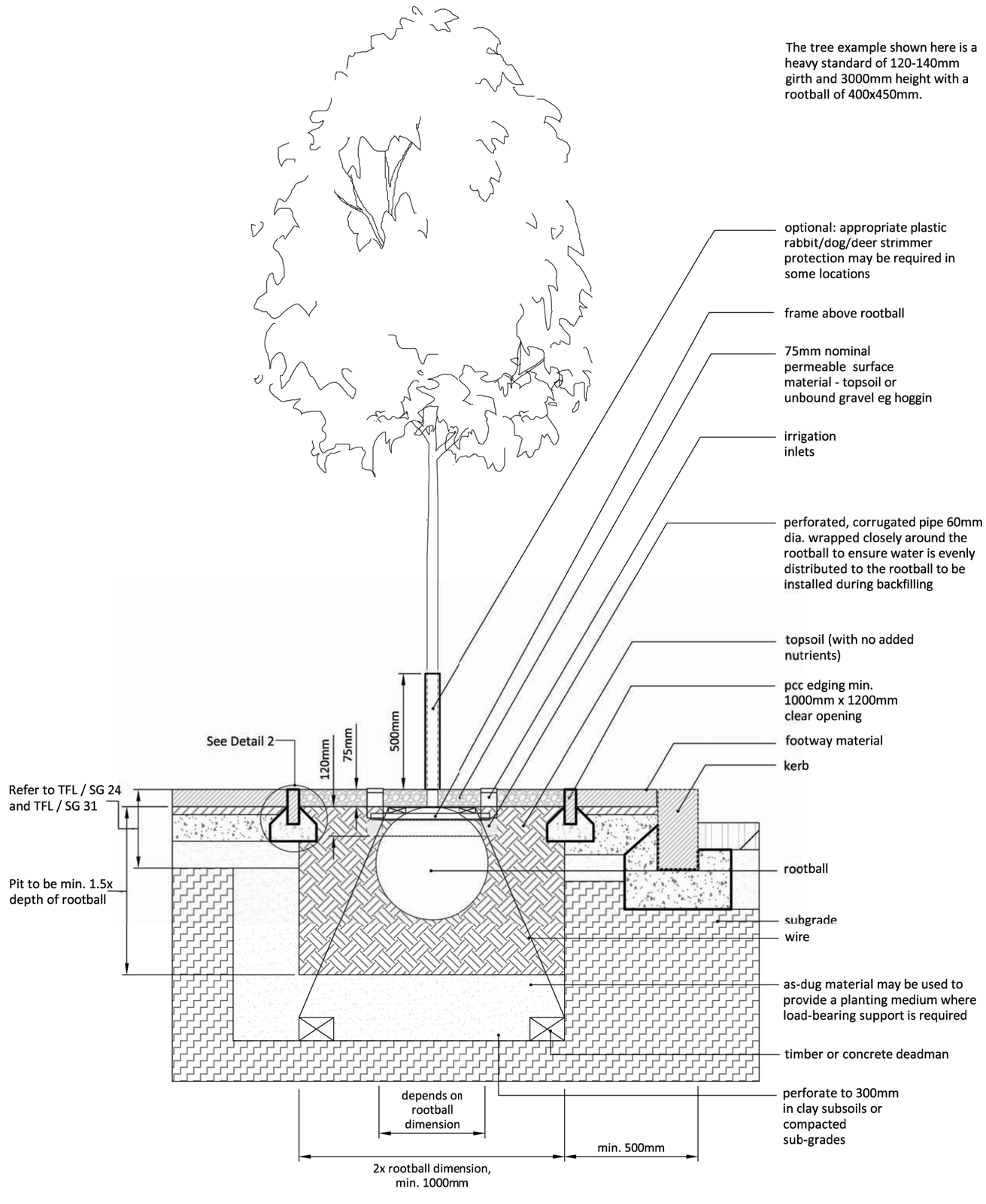
Rev 3

Detail 1
Edging layout



Detail 2
Edging & haunching





Notes:

1. Advice and approval must be obtained from the Route Manager - Arboriculture & Landscape prior to planting.
2. The tree pit dimensions depend on the species and type of container or rootball.
3. Irrigation will be determined by the prevailing weather conditions and will be as specified or instructed by the Route Manager - Arboriculture & Landscape.
4. Soil testing may be recommended by the Route Manager - Arboriculture & Landscape prior to re-use of as-dug material.
5. As-dug material placed in layers and carefully compacted, in accordance with the Specification for Highway Works, so as not to damage tree roots to give a CBR of at least 2% at formation level.
6. Advice must be obtained from specialist suppliers in the event that structural tree soil is to be considered in lieu of as-dug material.
7. It is the Contractor's responsibility to make further enquiries and investigations, including trial holes, to determine the location of utilities.
8. Refer to drawing TFL/SG 34 Sheet 2 of 2 for additional tree pit details.
9. Refer to drawing TFL/SG 24 and TFL/SG 31 for footway and kerb details.
10. Materials and operations must comply with latest edition of British Standard or Code of Practice where relevant (eg topsoil).
11. Approval of ancherage system must be obtained from Route Manager - Arboriculture & Landscape.

Rev.	Date	Description	Chkd.	App.
4	02.12.08	Anchorage & pit edging rev'd	CH	AMG
3	28.03.08	Revision 3 Minor Amendments	BS	CNR
2	05.03.08	Revision 2 Minor Amendments	BS	CNR
1	28.01.08	Revision 1 Minor Amendments	BS	CNR
0	09.01.08	First Issue	BS	CNR

STREETS

Project

Streetscape Guidance

Drawing Title

Tree Pit in Paved Areas
Sheet 1 of 2

Drawing Status

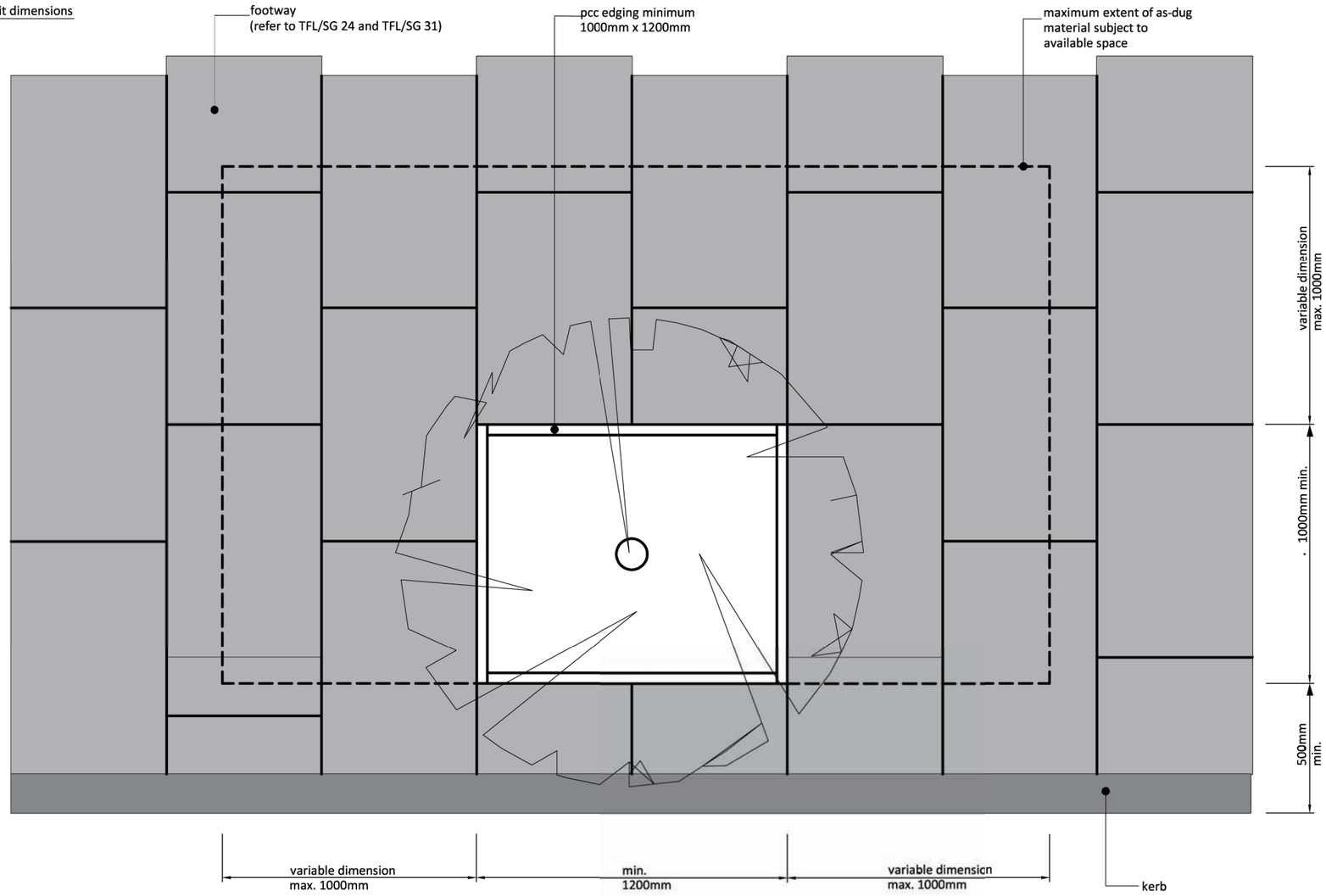
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
ATKINS	TFL	not to scale	A3

Drawing No. TFL/SG 33

Rev 4

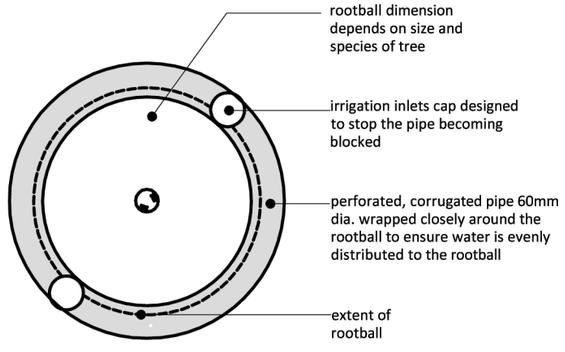
Plan
Variable tree pit dimensions



Notes:

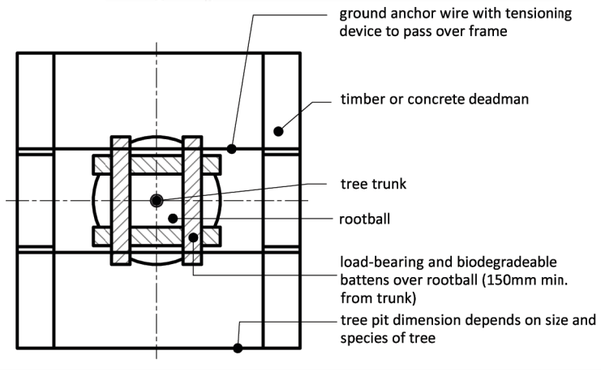
1. Advice and approval must be obtained from the Route Manager - Arboriculture & Landscape prior to planting.
2. The tree pit dimensions depend on the species and type of container or rootball.
3. Irrigation will be determined by the prevailing weather conditions and will be as specified or instructed by the Route Manager - Arboriculture & Landscape.
4. Soil testing may be recommended by the Route Manager - Arboriculture & Landscape prior to re-use of as-dug material.
5. As-dug material placed in layers and carefully compacted, in accordance with the Specification for Highway Works, so as not to damage tree roots to give a CBR of at least 2% at formation level.
6. Advice must be obtained from specialist suppliers in the event that structural tree soil is to be considered in lieu of as-dug material.
7. It is the Contractor's responsibility to make further enquiries and investigations, including trial holes, to determine the location of utilities.
8. Refer to drawing TFL/SG 33 Sheet 1 of 2 for additional tree pit details.
9. Refer to drawing TFL/SG 24 and TFL/SG 31 for footway and kerb details.
10. Materials and operations must comply with latest edition of British Standard or Code of Practice where relevant (eg topsoil).
11. Approval of anchorage system must be obtained from Route Manager - Arboriculture & Landscape

Detail 4
Irrigation pipe detail
plan view

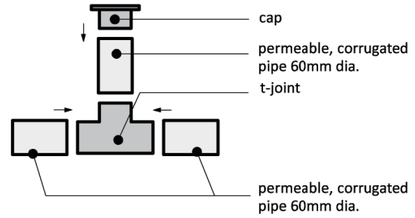


Detail 5
Ground anchor detail
plan view

Note:
This detail may vary depending on type of system used



Detail 6
Irrigation inlet detail
exploded elevation



Rev.	Date	Description	Chkd.	App.
5	02.12.08	Anchorage & pit edging rev'd	CH	AMG
4	02.04.08	Guidance Issue No.2	BS	CNR
3	28.03.08	Revision 3 Minor Amendments	BS	CNR
2	05.03.08	Revision 2 Minor Amendments	BS	CNR
1	28.01.08	Revision 1 Minor Amendments	BS	CNR
0	09.01.08	First Issue	BS	CNR

STREETS

Project
Streetscape Guidance

Drawing Title
Tree Pit in Paved Areas
Sheet 2 of 2

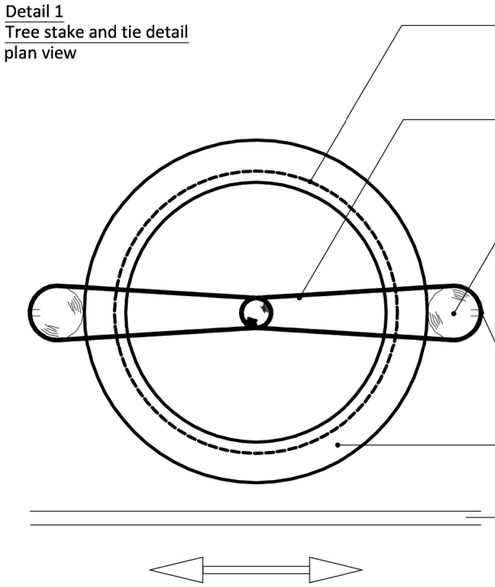
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
ATKINS	TFL	not to scale	A3

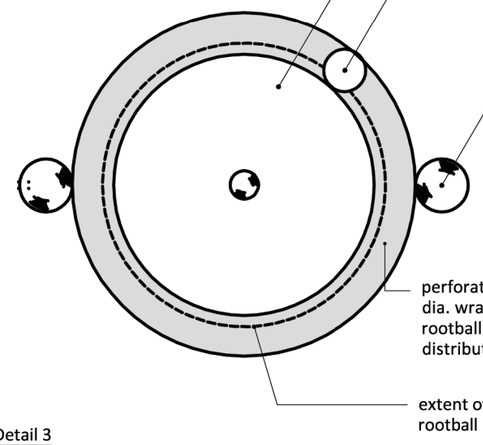
Drawing No.
TFL/SG 34

Rev
5

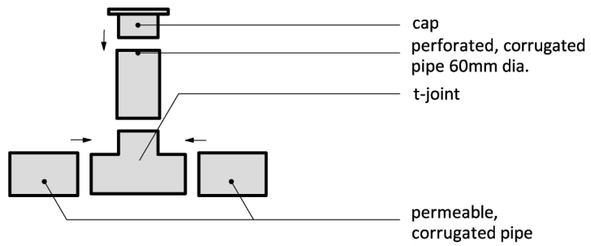
Detail 1
Tree stake and tie detail
plan view

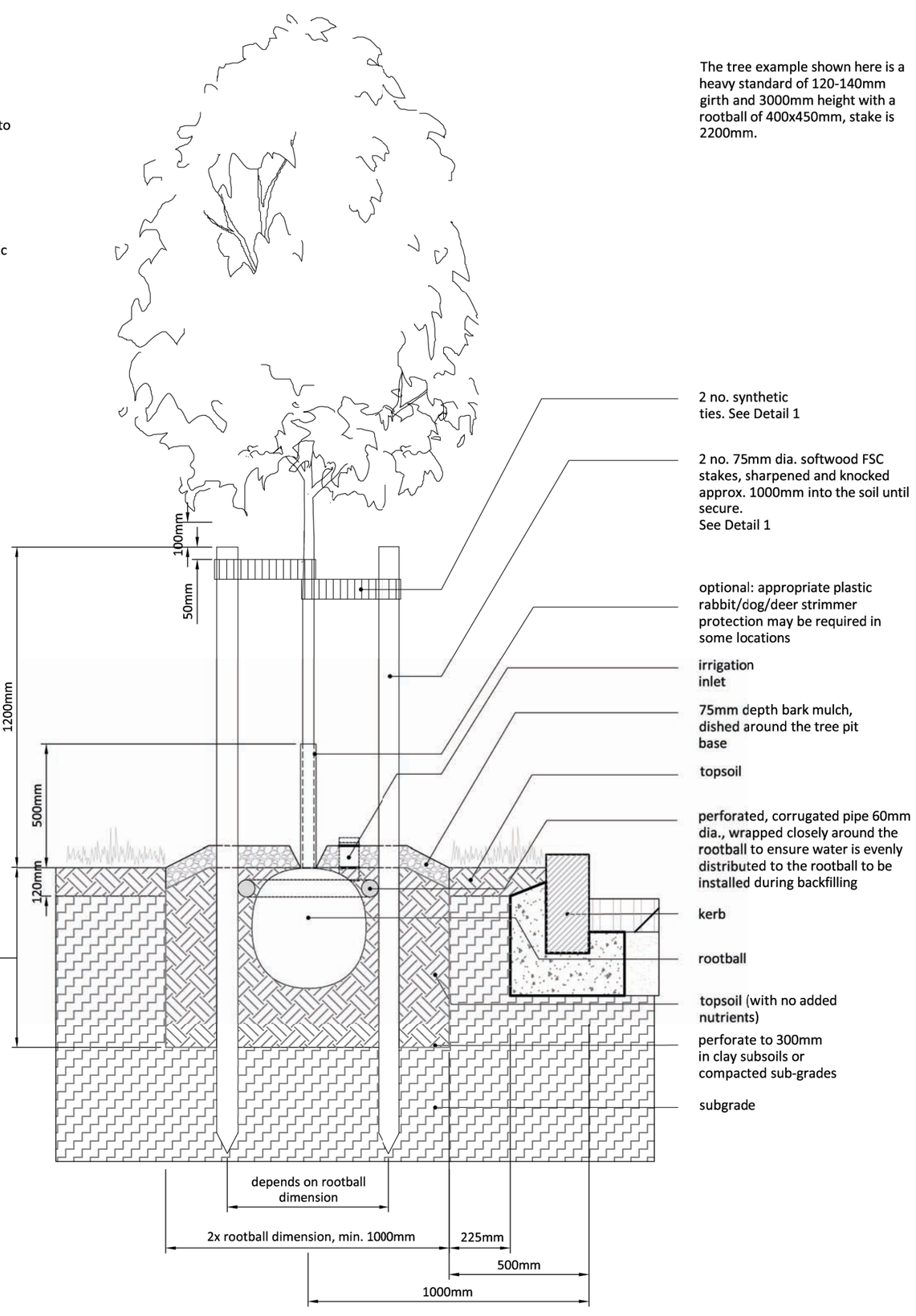


Detail 2
Irrigation pipe detail
plan view



Detail 3
Irrigation inlet detail
exploded elevation





The tree example shown here is a heavy standard of 120-140mm girth and 3000mm height with a rootball of 400x450mm, stake is 2200mm.

2 no. synthetic ties. See Detail 1

2 no. 75mm dia. softwood FSC stakes, sharpened and knocked approx. 1000mm into the soil until secure.
See Detail 1

optional: appropriate plastic rabbit/dog/deer strimmer protection may be required in some locations

irrigation inlet

75mm depth bark mulch, dished around the tree pit base

topsoil

perforated, corrugated pipe 60mm dia., wrapped closely around the rootball to ensure water is evenly distributed to the rootball to be installed during backfilling

kerb

rootball

topsoil (with no added nutrients)

perforate to 300mm in clay subsoils or compacted sub-grades

subgrade

Notes:

1. Advice and approval must be obtained from the Route Manager - Arboriculture & Landscape prior to planting.
2. The tree pit dimensions depend on the species and type of container or rootball.
3. Irrigation will be determined by the prevailing weather conditions and will be as specified or instructed by the Route Manager - Arboriculture & Landscape.
4. Soil testing may be recommended by the Route Manager - Arboriculture & Landscape prior to re-use of as-dug material.
5. It is the Contractor's responsibility to make further enquiries and investigations, including trial holes, to determine the location of utilities.
6. Materials and operations must comply with latest edition of British Standard or Code of Practice where relevant (eg topsoil).

Rev.	Date	Description	Chkd.	App.
4	02.12.08	Rootball size amended	CH	AMG
3	28.03.08	Revision 3 Minor Amendments	BS	CNR
2	05.03.08	Revision 2 Minor Amendments	BS	CNR
1	28.01.08	Revision 1 Minor Amendments	BS	CNR
0	09.01.08	First Issue	BS	CNR

STREETS

Project

Streetscape Guidance

Drawing Title

Tree Pit in Grassed Verge

Drawing Status

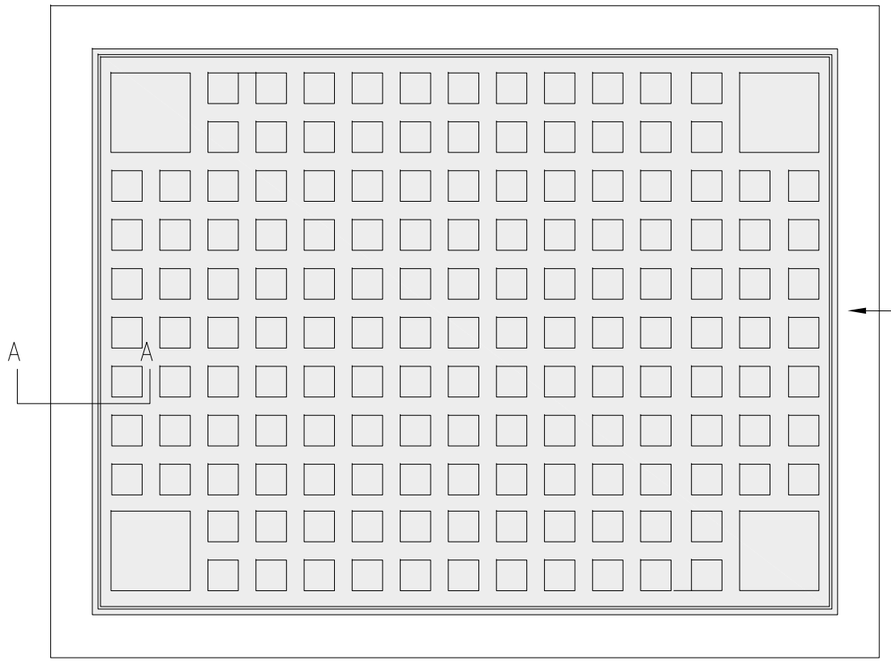
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
ATKINS	TFL	not to scale	A3

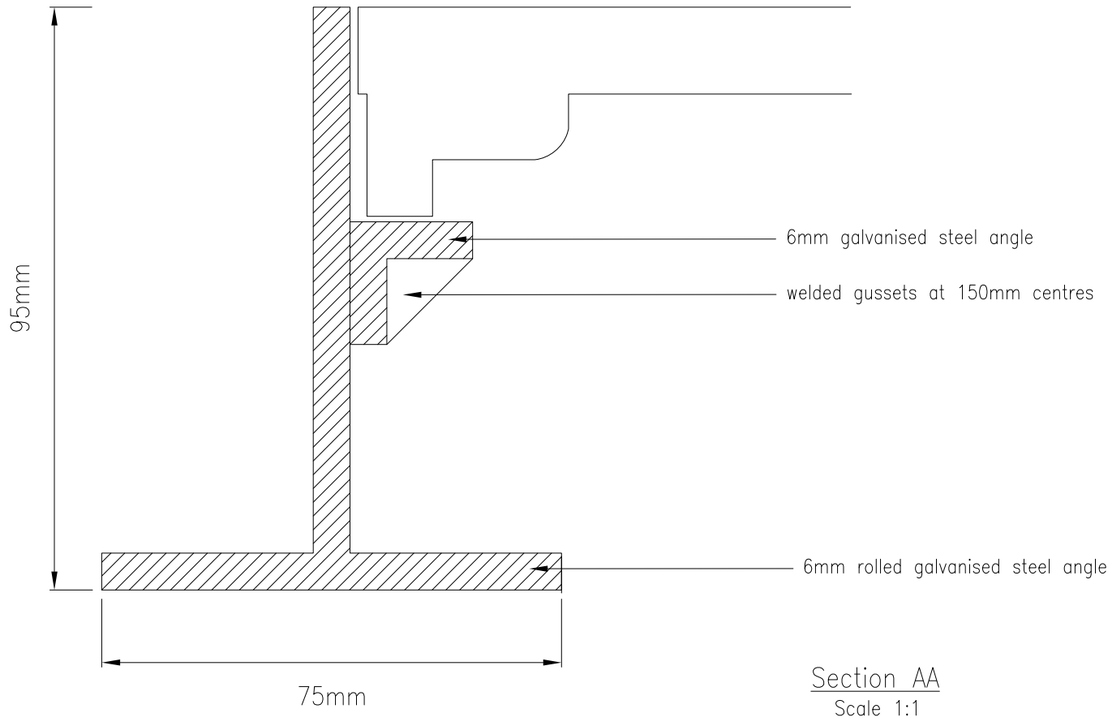
Drawing No. TFL/SG 35

Rev 4

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk, iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan
Scale 1:5



Section AA
Scale 1:1

Notes

1. The deep frame allows close butting up to the frame of adjoining material

2. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.

3. Existing Chambers walls may require lowering to accommodate the deeper frame. Where this is neccessary a line of bricks is to be removed and the chamber wall rebuilt. The frame should be flush and must abut surrounding paving flags.

4. Standard slide out ductile iron access covers BS EN 124 Class 125.

5. All frames to be min. 6mm thick cast structural steel plate to BS EN 124:1994 formed to required profile and wielded using CO_2 process.

6. All frames and covers to be hot dipped galvanised after manufacture to BS 729:1995.

7. The initials of appropriate utility company shall be marked on the covers.

8. Six sets of lifting keys to be provided to engineer.

9. All work must be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

10. Refer to Drg. TfL/SG21 for surrounding flag arrangement details.

Rev.	Date	Description	Chkd.	App.
1	30/06/08	GUIDANCE ISSUE NO. 2	SB	JDS

Project
Streetscape Guidance

Drawing Title
Deep type frames for utility access covers – Transport for London

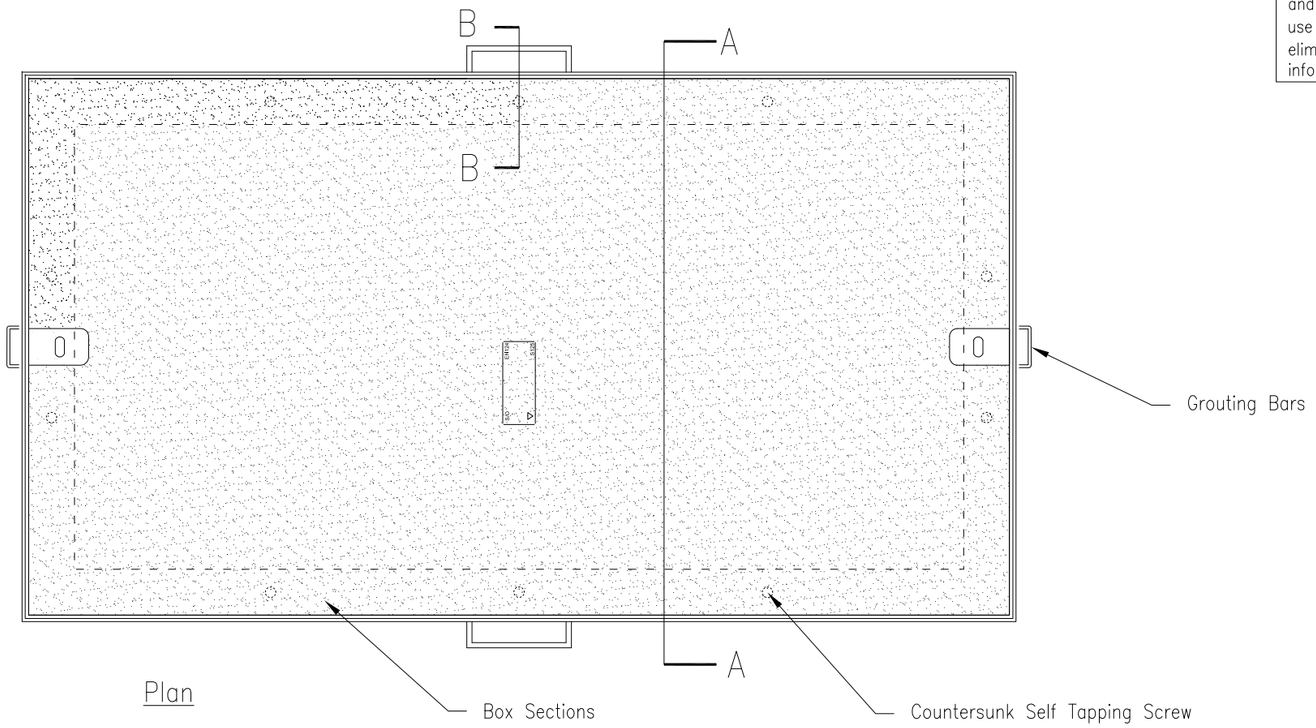
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
RMP	TFL	As Shown	A3

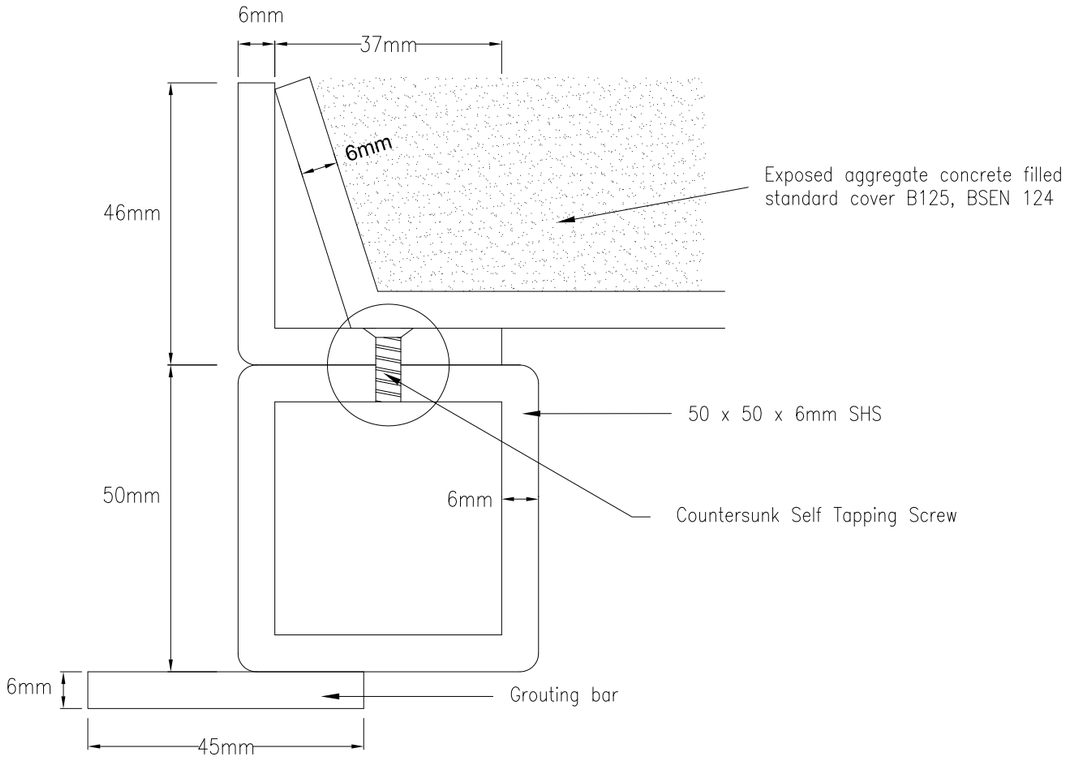
Drawing No. TFL/SG36

Rev 1

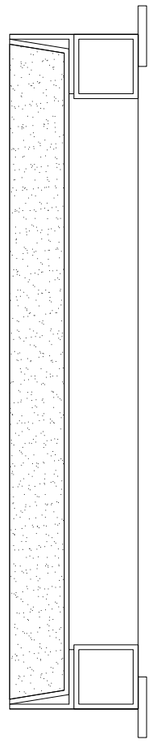
With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk, iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan



Section BB
Scale 1:1



Section AA

Key

Aggregate Concrete

Notes

1. The deep frame allows close butting up to the frame of adjoining materials.

2. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.

3. Existing Chambers walls may require lowering to accommodate the deeper frame. Where this is neccessary a line of bricks is to be removed and the chamber wall rebuilt. The frame should be flush and must abut surrounding paving flags.

4. All frames and covers to be min. 6mm thick cast structural steel plate to BS EN 124:1994 formed to required profile and wielded using CO_2 process.

5. All frames and covers to be hot dipped galvanised after manufacture to BS 729:1995.

6. The initials of appropriate utility company shall be marked on the covers.

7. After brushing in of sand, all covers shall be lifted, and sand between the covers and frame removed to ensure future ease of access. The covers shall then be re-fitted.

8. Six sets of lifting keys to be provided to engineer.

9. All work must be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

10. Refer to Drg. TfL/SG21 for surrounding flag arrangement details.

Rev.	Date	Description	Chkd.	App.
1	30/06/08	GUIDANCE ISSUE NO.2	SB	JDS

STREETS

Project
Streetscape Guidance

Drawing Title
Deep type frames for utility access covers – British Telecom Plc.

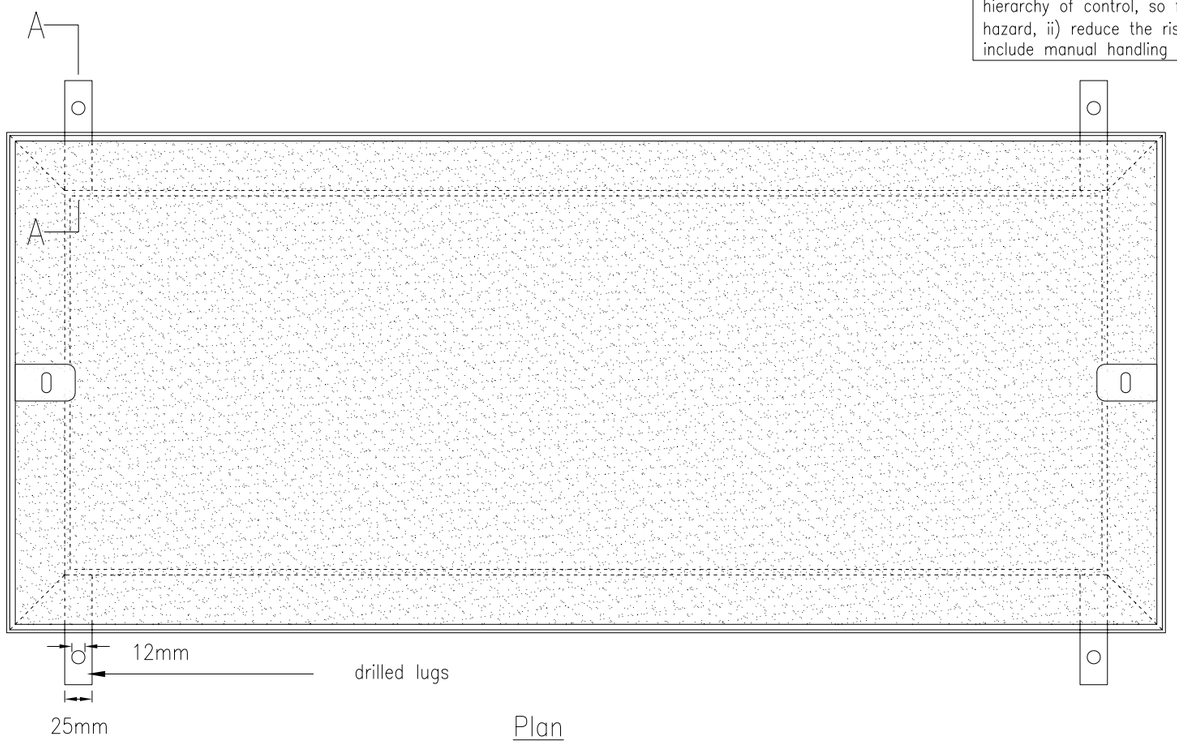
Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
RMP	TFL	NTS	A3

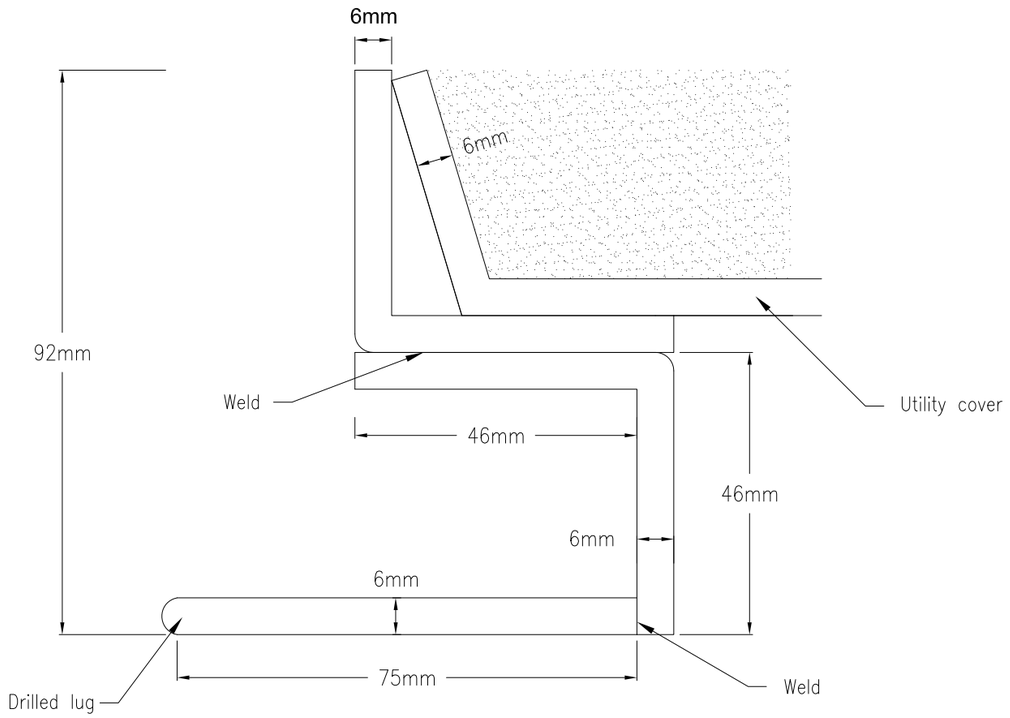
Drawing No.
TFL/SG37

Rev
1

With reference to designer's duties under the Construction (Design and Management) Regulations 2007, design teams are reminded to use a hierarchy of control, so far as is reasonably practical, to i) eliminate the hazard, ii) reduce the risk, iii) provide relevant information. Key risks include manual handling and dust inhalation.



Plan



Section AA
Scale 1:1

Notes

1. The deep frame allows close butting up to the frame of adjoining materials.

2. Existing chambers to be surveyed by the contractor to determine appropriate frame and cover to be supplied at each location.

3. Existing Chambers walls may require lowering to accommodate the deeper frame. Where this is neccessary a line of bricks is to be removed and the chamber wall rebuilt. The frame should be flush and must abut surrounding paving flags.

4. All frames and covers to be min. 6mm thick cast structural steel plate to BS EN 124:1994 formed to required profile and wielded using CO_2 process.

5. All frames and covers to be hot dipped galvanised after manufacture to BS 729:1995.

6. The initials of appropriate utility company shall be marked on the covers.

7. After brushing in of sand, all covers shall be lifted, and sand between the covers and frame removed to ensure future ease of access. The covers shall then be re–fitted.

8. Six sets of lifting keys to be provided to engineer.

9. All work must be carried out in compliance with the requirements of The Manual Handling Operations Regulations 1992 (as amended in 2002).

10. Refer to Drg. TfL/SG21 for surrounding flag arrangement details.

Key

Aggregate Concrete

Rev.	Date	Description	Chkd.	App.
1	30/06/08	GUIDANCE ISSUE NO.2	SB	JDS

STREETS

Project
Streetscape Guidance

Drawing Title
Deep type frames for utility access covers – Water Mains, EL, CT

Drawing Status
GUIDANCE ISSUE No 2

Drawn	Designed	Scale	Size
RMP	TFL	NTS	A3

Drawing No. TFL/SG38

Rev 1

12 Appendix

Image references

Page	Location
Cover	A3211 Victoria Embankment A
1.1	A100 Tower Bridge T
2.1	A3214 Buckingham Palace Road T
3.1	A3211 Victoria Embankment T
4.1	A3220 Holland Road T
5.1	A10 Bishopsgate T
6.1	A40 Hillingdon T
6.3	A24 Clapham Common T South Side
6.4	A4202 Park Lane T
6.6	A4 Brompton Road T
6.8	A3220 Holland Road T
6.10	A40 Western Avenue, T
6.12	A205 John Wilson Street T
6.14	A4 Bath Road T
7.1	A4 Cromwell Gardens T
7.3	From top: A202 Vauxhall Bridge Road T A200 Tooley Street T A312 The Cause Way T
7.6	Pedestrian crossing T Pedestrian crossing T
7.7	Pedestrian crossing T Inspection cover A
7.8	Curved granite kerb stones A
7.9	Curved kerb T
7.10	Curved kerbs layout at bay – Tooley Street T
7.11	Footway Crossovers – continuation of footway surface P
7.13	A3211 Upper Thames Street T
7.15	A3 Kennington Park Road T
7.16	Cycle lane, A3211 Upper Thames Street T
7.17	A3 Kennington Park Road T
7.18	A3211 Upper Thames Street T
7.19	From left: A1203 East Smithfield T A406 North Circular T
7.20	A3220 Holland Road - Loading bay T
7.22	From top: A3 Kennington Park Road T A3211 Victoria Embankment, T
8.1	A22 Purley T
8.8	A501 Euston Road A
8.9	A21 Sevenoaks Road T
8.10	A502 Camden High Street T
8.11	A1 Archway Road P
8.13	From top: A200 Tooley Street T A3211 Victoria Embankment A
8.14	A4202 Park Lane A
8.15	A3212 Grosvenor Road T
8.16	Cycle stand T A302 Bressenden Place T
8.17	A503 Camden Road T
8.18	Left to right: A3220 Holland Road T A3200 York Road T
8.19	A3212 Millbank T
8.20	Tram stop T Tram stop T
8.21	A4 Brompton Road T
8.25	A21 Knock Holt T
8.26	Salt bin A A203 South Lambeth Road T
8.27	A13 Lodge Avenue roundabout, Ripple Road D
9.1	A501 Marylebone Road T
9.2	A10 Shoreditch High Street T
9.3	A5204 Oxford Street A A100 Tower Hill T
9.4	A4209 Sussex Gardens P
9.6	Trade refuse bin A
9.7	A4 Brompton Road A
9.8	A3211 Victoria Embankment A
9.9	A3200 Southwark Street T Right side, from top: Wellcome Trust, A501 Euston Road A Smoke vent close up A
9.10	A5 Edgware Road A
10.1	A102 Blackwall Tunnel Approach T
10.2	A4 Bath Road T
10.3	A4202 Park Lane A
10.4	A501 Euston Road A Right side, from top: Chewing gum on carriageway A
10.5	Flyposting A Graffiti on footpath A
10.6	Marble Arch A
11.1	A3 Tolworth Rise T
12.1	A5 Edgware Road T

Key to photograph acknowledgements:

- A Arup
- D Douglas Atfield
- P Project Centre
- T TfL Visual Image Services

Note: images may not reflect actual site conditions

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- BS EN 124: Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking, quality control
- BS EN 13201: Road lighting
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