Town Centre Public Realm

Design Baseline 2007-2012

www.bolton.gov.uk/publicrealm

Bolton Council

Public Realm Design Baseline

01 Introduction

The Public Realm Implementation Framework 2007-2012

Context of the Public Realm Implementation Framework 2007-2012

Bolton is at the start of a period of inward investment, economic renaissance and urban regeneration. The success of the town centre will be at the heart of these improvements. The Council launched the Bolton Town Centre Action Framework 2005-2008 in November 2004. This identified the Council's key aims in making a first class town centre that people will use and be proud of. This Framework is underpinned by four supporting strategies:

- Building Bolton (Bolton Council)
- Bolton Council Transport Strategy (Bolton Council)
- Position Statement (Jones Lang LaSalle & Regeneris)
- Public Realm Implementation Framework 2007-2012 (Camlin Lonsdale)

The first three of these are now in place. This is the fourth strategy which comes in three parts, this being the second.

Purpose of the Public Realm Implementation Framework 2007-2012

This report will address directly the Council's strategic aim to create a town centre that will attract investment and that people will be happy and proud to use. The objectives can be summarised as:

- Create a vision for Bolton's public realm
- Ensure consistency of design and quality in the creation of the public realm
- Create a more functional and pedestrian friendly environment
- Channel public realm investment effectively
- Provide a context for public realm funding bids and negotiations
- Achieve high standards in design and maintenance

Structure of the 'Public Realm Implementation Framework 2007-2012'

This Public Realm Design Baseline is the second part of the larger commission, the Public Realm Implementation Framework 2006-2012 (PRIF), which is structured as follows:

Section One
Public Realm Strategy
draft November 2006

Section Two
Public Realm Design Baseline
draft January 2007

Section Three
Implementation Plan 2007-2012
draft February 2007

The Public Realm Design Baseline

Purpose of the Public Realm Design Baseline

This report aims to provide clear design guidance to those implementing public realm, whether public funded environmental improvements or public spaces delivered as part of development. It sets out design principles on a town wide scale and categorises the streets and spaces as set out in the Public Realm Strategy. Although it does not include construction details, it gives appropriate detail on how the various recommended surfacing materials, furnishings, planting and lighting can be employed successfully. It shows how these elements come together to form typical street types and junctions. Adherence to these recommendations by public realm designers of individual schemes will produce incrementally a town centre which is historically responsive, elegant, safe, enjoyable and practical to maintain. In short, it will deliver the vision set out in the Public Realm Strategy.

Sections of this Report

The Public Realm Design Baseline is structured as follows:

1 **Introduction**
Outlines the context and purpose of the Public Realm Design Baseline

2 **Spatial Types**
Categorises and describes the spaces in the town centre

3 **Junctions**
Shows indicative details for typical junction situations

4 **Surfacing Details**
Sets out the range and quality of surfacing materials

5 **Design for Traffic**
Discusses how the public realm is designed for pedestrian and vehicular movement

6 **Furniture**
Sets out the range and quality of street furniture

7 **Lighting**
Describes how the public realm is lit

8 **Planting**
Describes the range of appropriate planting and how to maximise success

9 **Maintenance, Repair and Reinstatement**
Addresses aftercare issues and services in particular

Contextual Material and Consultation

This report has been prepared with reference to various policies and design guidance. These are listed in Appendix A. Perhaps more importantly, these recommendations follow extensive consultation with Bolton Council Officers with responsibility for planning, design, maintenance and management of the public realm. Consequently, it is intended that the proposals respond to practical day to day issues in a pragmatic and helpful way whilst still setting out how a step change in public realm quality can be achieved.

The Public Realm Design Baseline

Cost and Quality

An uplift in the quality of public realm requires an increase in implementation budgets. The whole of the Public Realm Implementation Framework is based on the premise that this investment is good value because of the extent to which it stimulates the economy of the town centre. Furthermore, the value of this investment must be protected by a wholehearted strategic commitment to properly funded management and maintenance. This document proposes a public realm which is designed to be readily maintainable. However, it must be recognised that public realm maintenance costs should rise.

Interpretation of Recommendations

This report makes clear recommendations regarding many aspects of public realm design, sufficient to set a quality benchmark for public realm implementation teams. Beyond that, the proposals are not prescriptive. The design team for each scheme will interpret these recommendations, alongside all other appropriate design guidance, but will retain design responsibility for all aspects, including highway alignment, traffic issues and structural design. It is important that these proposals are applied consistently over the five year period, across the whole town centre and throughout the different types of development and environmental enhancement project. Therefore it is recommended that Bolton Council identifies a multidisciplinary officer panel to work with the PRIF and comment on schemes at appropriate stages.

02 Spatial Types

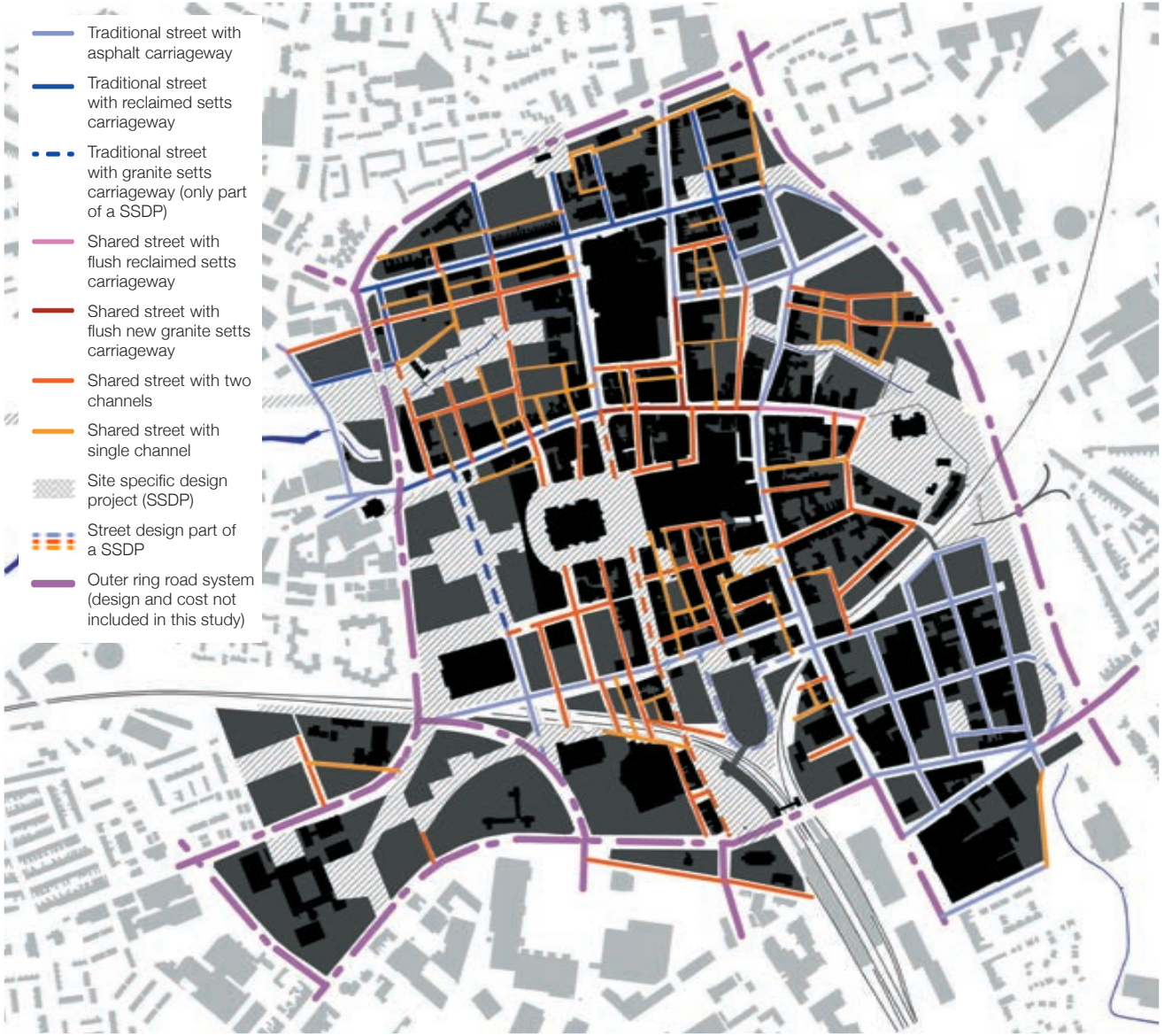
Spatial Types Plan

This plan categorises all of the public realm spaces in the town centre in terms of overall form and purpose. There is a major distinction between streets with a traditional carriageway separating pedestrian from vehicular traffic and shared streets where all modes of transport move around on a common flush surface with no delineation. Between these two groups are streets with carriageways defined but with no kerb upstand.

Much of the public realm is categorised as ‘Site Specific Design Project’. The design of these should respond to individual briefs to make distinct and purposeful spaces. However, each proposal should be developed in the context of the character of the area and the overall Public Realm Strategy.

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

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

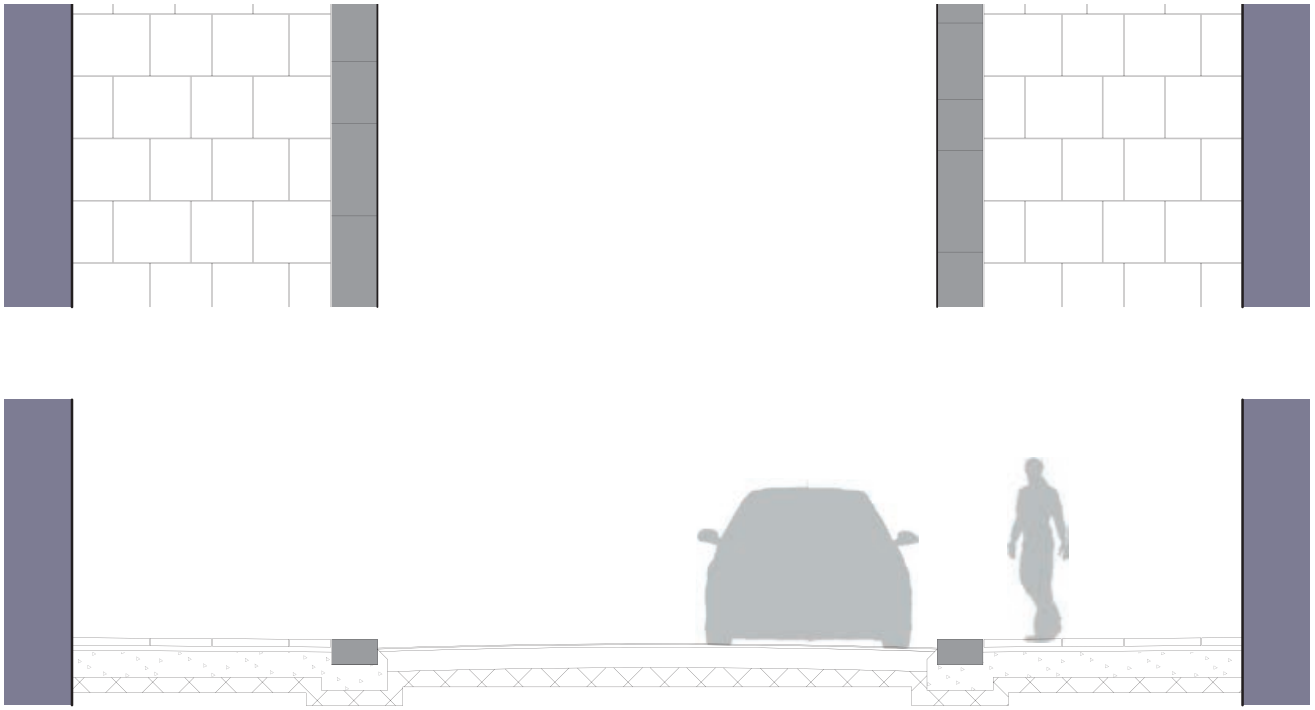


Traditional Street with Asphalt Carriageway

- Upstand kerb to carriageway
- Blacktop carriageway
- Yorkstone flags (large) on footway
- Granite standard kerb
- Low upstand kerb, nom 75mm
- Wide footway
- Channels formed from blacktop

Example:

Knowsley Street, Bow Street, Bank Street, Bradshawgate, Shiffnall Street, Salop Street, Great Moor Street

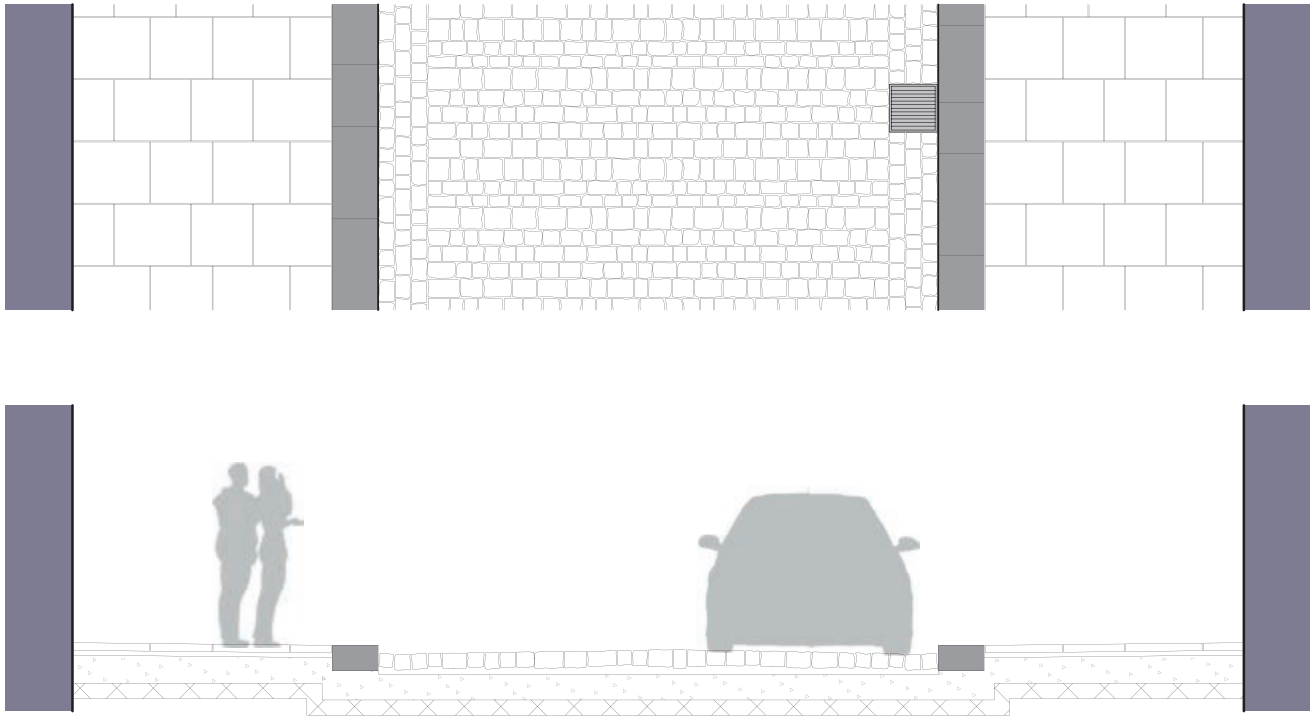


Traditional Street with Reclaimed Setts Carriageway

- Upstand kerb to carriageway
- Recalimed setts carriageway
- Yorkstone flags (large) on footway
- Granite standard kerb
- Low upstand kerb, nom 75mm
- Wide footway
- Channel formed with reclaimed setts
- Gully grating dimension to fit channel width

Example:

Deansgate (part of),
St George's Road, Bath Street,
All Saints Street

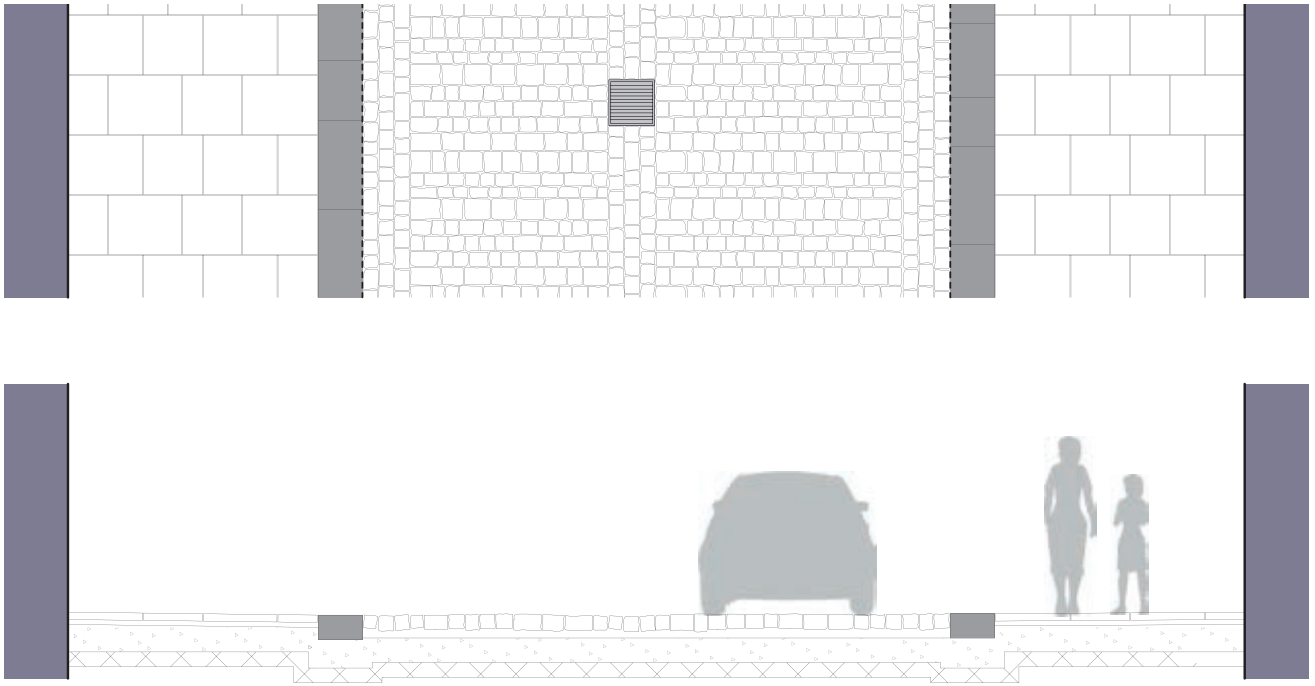


Shared Street with Flush Reclaimed Setts Carriageway

- Carriageway flush surface with adjacent surface
- Reclaimed setts carriageway
- Yorkstone flags (large) on footway
- Granite standard kerb
- Flush kerb, nom 5mm upstand
- Channel formed with reclaimed setts
- Gully grating dimension to fit channel width
- Carrriageway plus loading bay / taxi rank

Example:

Churchgate

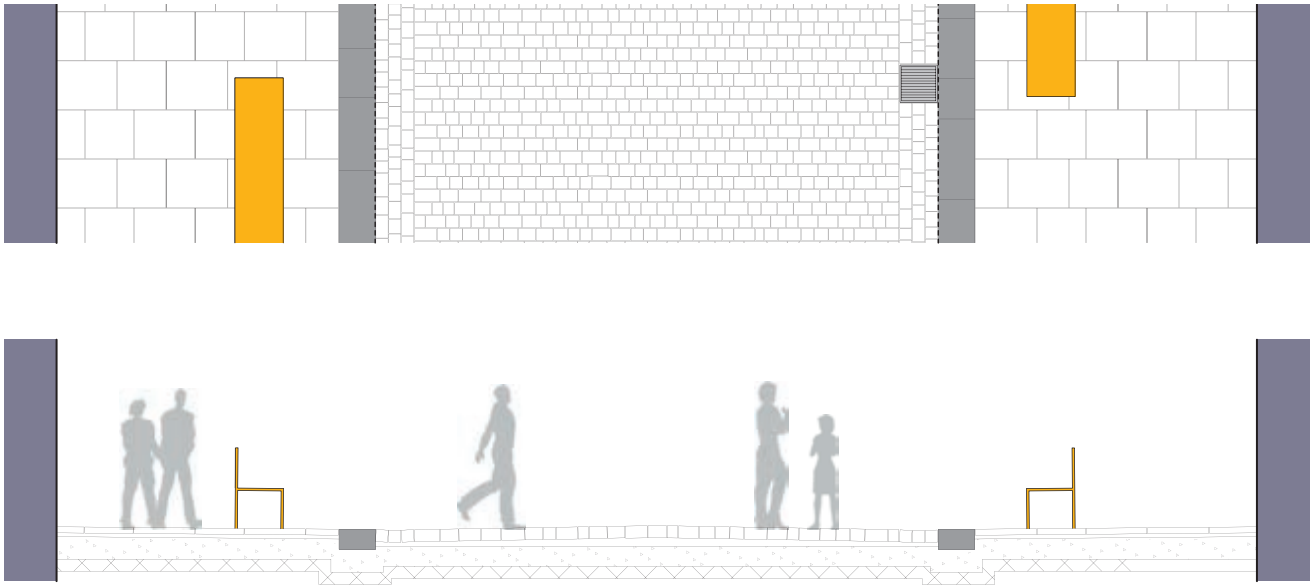


Shared Street with Flush New Granite Setts Carriageway

- Carriageway flush surface with adjacent surface
- New granite setts carriageway
- Yorkstone flags (large) on footway
- Granite standard kerb
- Flush kerb, nom 5mm upstand
- Channel formed with new granite setts
- Gully grating dimension to fit channel width
- Provision of seating and other furniture

Example:

Deansgate (part of),
Bridge Street (part of)

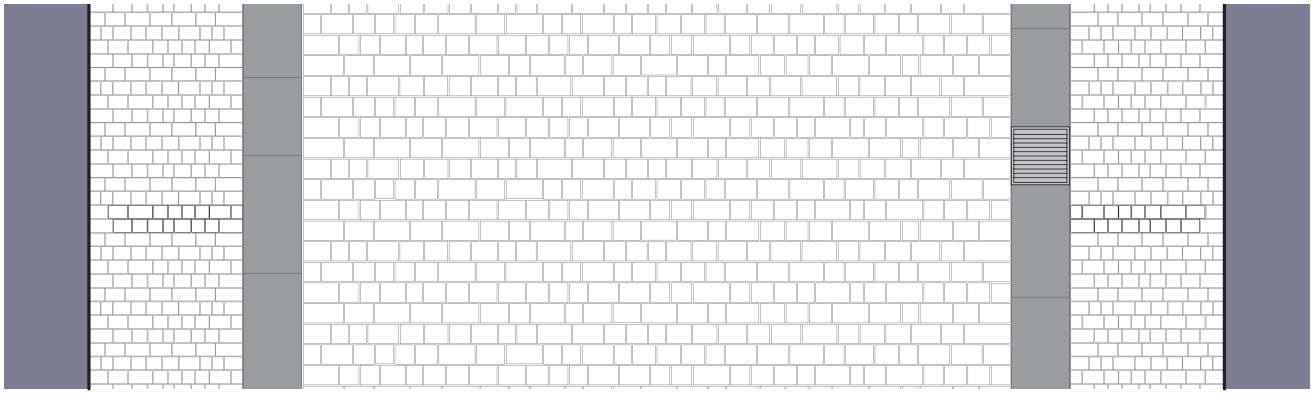


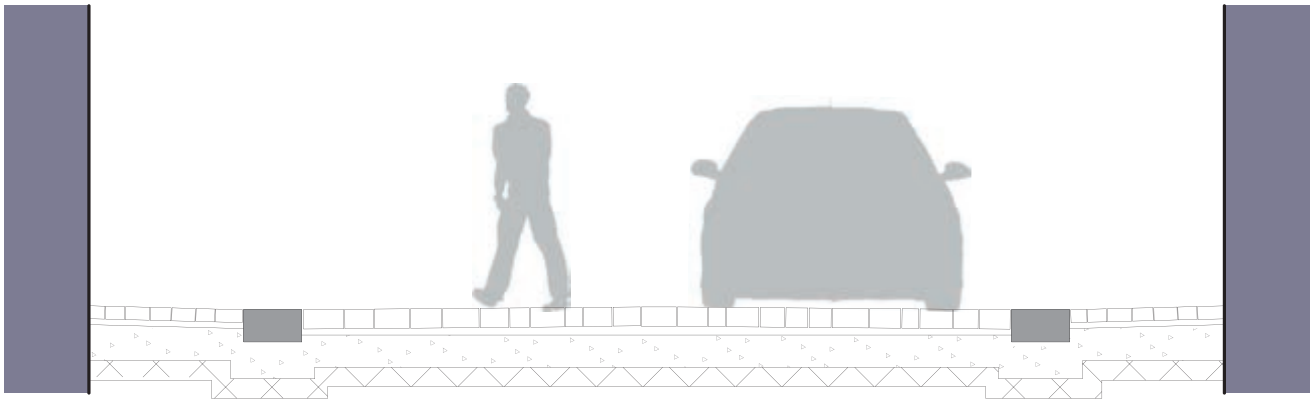
Shared Street with Two Channels

- Flush surface
- Two flush granite trims as channels (one could be replaced with a covered channel if levels and drainage require)
- Two sizes of new granite setts (Small and large granite setts)
- Gully grating dimension to fit channel width
- For streets wider than 7m

Example:

Silverwell Street, Ashburner Street, Market Street, Central Street, Mawdsley Street, Bark Street



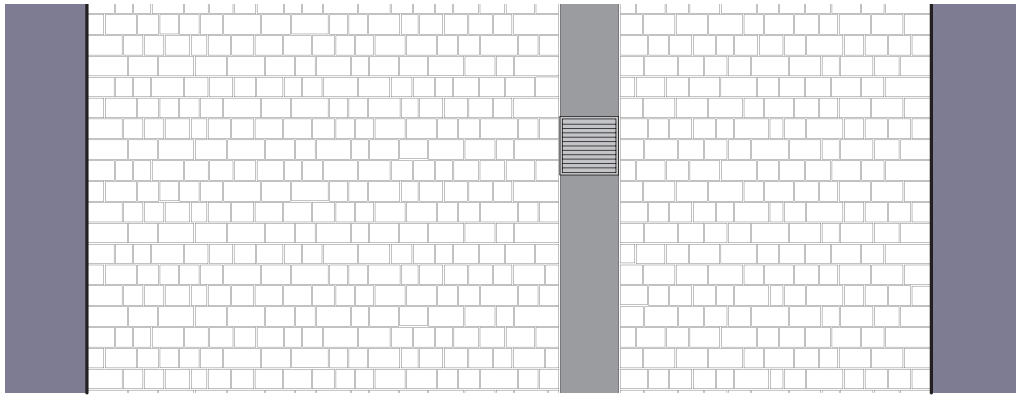


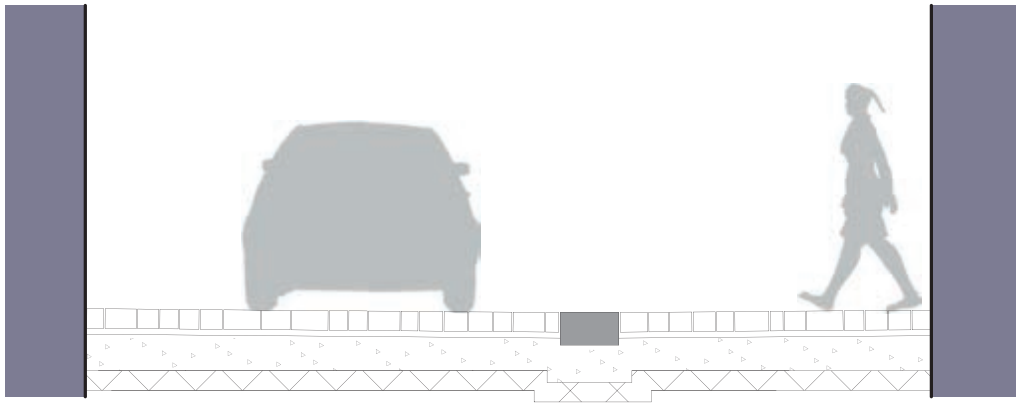
Shared Street with Single Channel

- Flush surface
- One single flush granite trims as channel (could be replaced with a covered channel if levels and drainage require)
- One sizes of new granite setts (Large granite setts)
- Gully grating dimension to fit channel width
- For streets narrower than 7m

Example:

Back Mawdsley Street, St Helena Road, Back Bark Street, Back King Street, Princess Street





03 Junctions

Junctions Plan

This drawing shows the locations of the different types of proposed junction design in the town centre. The junction types are determined by a combination of:

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

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

- Traditional Street / Shared Flush Street - **Raised Crossing** with new granite setts
- Traditional Street / Traditional Street - **Dropped Crossing with** new granite setts
- Traditional Street / Shared Flush Street - **Dropped Crossing with** new granite setts
- Traditional Street / Traditional Street - **Dropped Crossing**, blacktop in carriageway
- Traditional Street / Shared Flush Street - **Dropped Crossing**, blacktop in carriageway
- Traditional Street / Shared Flush Street - **Minor Junction** / no crossing / vehicle crossover
- **Shared** Flush Street / **Shared** Flush Street

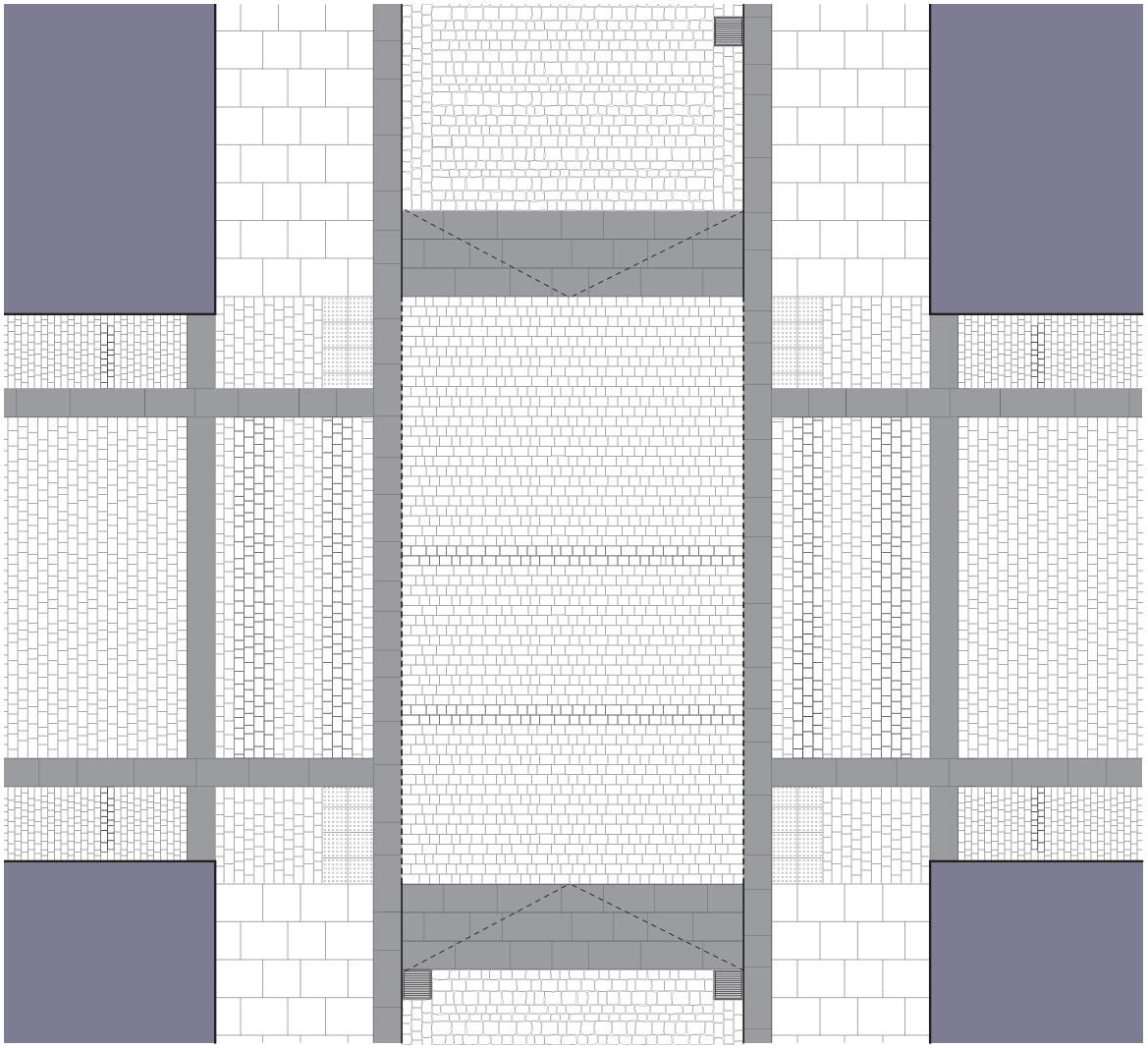
Raised Crossing with New Granite Setts

Traditional Street / Shared Flush Street

- Blacktop or reclaimed setts carriageway at traditional street
- Yorkstone flags (large) on footway
- New granite setts at shared street
- Granite trim at end of shared street
- New granite setts at footway leading to shared street
- Granite blister tactile paving
- Three granite trims in carriageway as ramp to pedestrian crossing
- New granite setts in cariagway as pedestrian crossing
- Nom 5mm lip to kerb at crossing

Example:

Knowsley Street / Deansgate,
Deansgate / Bradshawgate,
Great Moor Street / Newport Street,
Deansgate / Blackhorse Street,
Bradshawgate / Silverwell Street



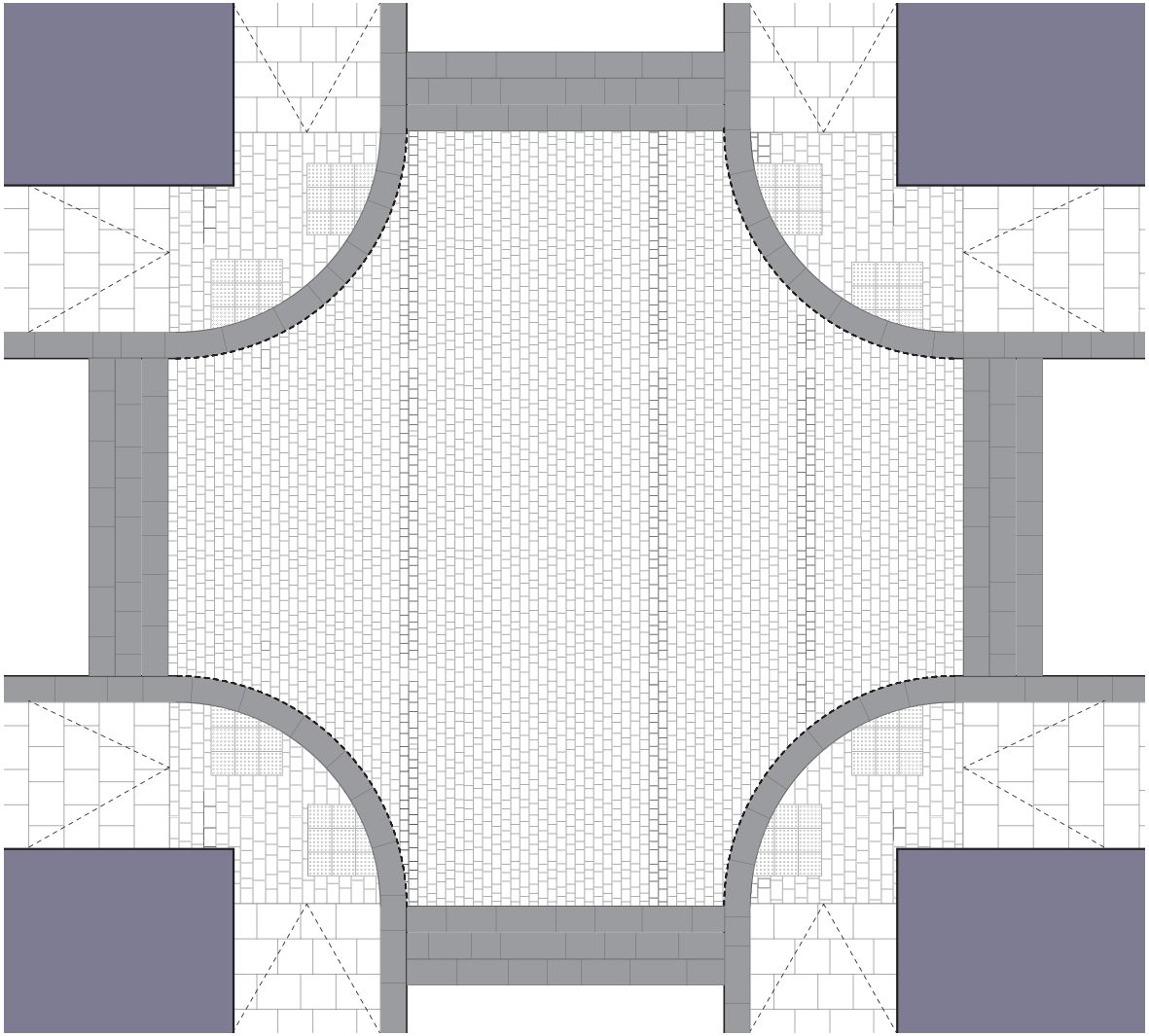
Dropped Crossing with New Granite Setts

Traditional Street / Traditional Street

- Blacktop or reclaimed setts carriageway
- Yorkstone flags (large) on footway
- Yorkstone flags (small) at corner
- Granite blister tactile paving
- Granite standard kerb
- Radius: 6m or 4m
- Nom 5mm lip kerb at crossing and radii

Example:

St George's Road / Pool Street,
St George's Road / Knowsley Street,
St George's Road / Bridge Street,
Bridgeman Place / Carlton Street,
Lower Bridgeman Street / Ash Street



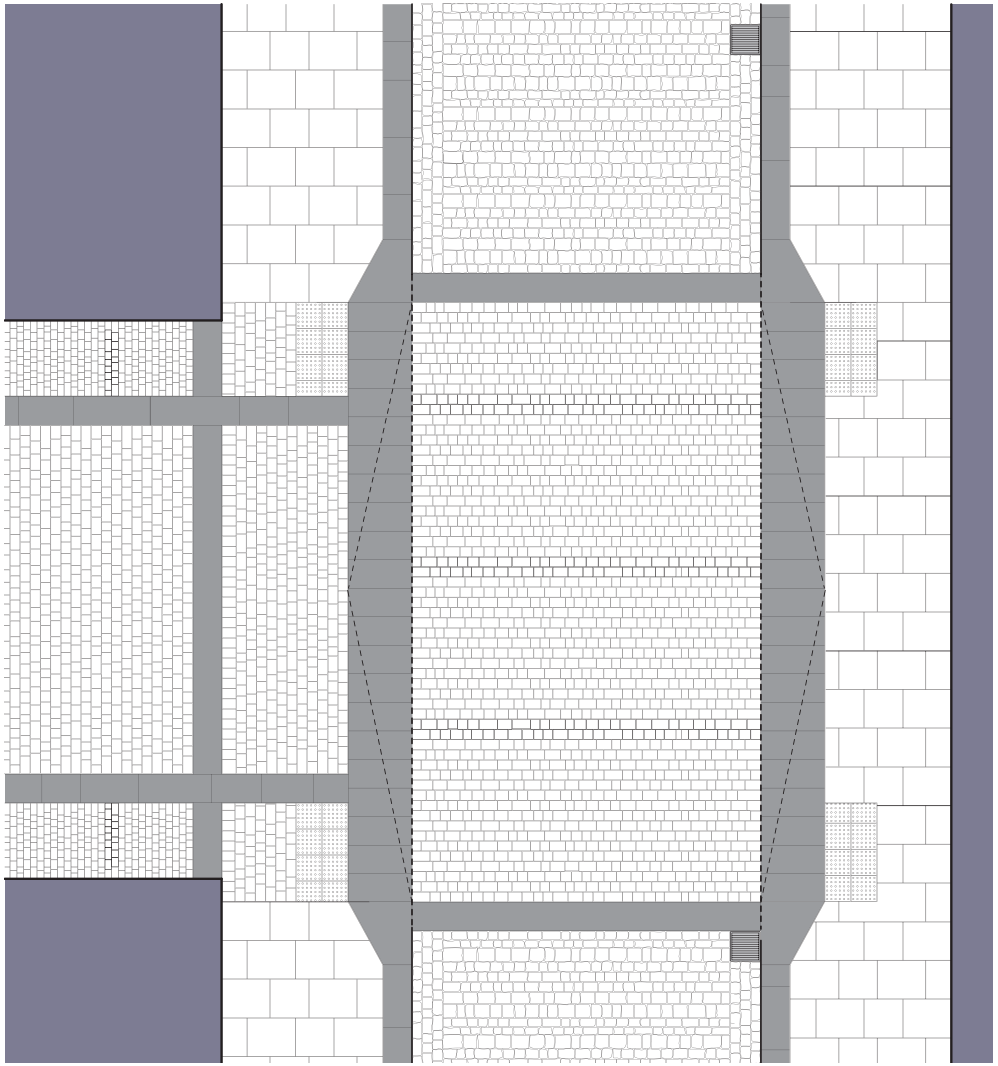
Dropped Crossing with New Granite Setts

Shared Street / Traditional Street

- Blacktop or reclaimed setts carriageway at traditional street
- Yorkstone flags (large) on footway
- New granite setts at shared street
- Granite trim at end of shared street
- New granite setts at footway leading to shared street
- Granite dropped kerb for pedestrian crossings
- Granite blister tactile paving
- If carriageway material of traditional street is reclaimed setts, crossing needs to be new granite setts, granite trim to mark change
- Nom 5mm lip to kerb at crossing

Example:

St George's Street / Duke Street,
Bath Street / Back St George's Road,
Deansgate / Central Street,
Great Moor Street / Dawes Street



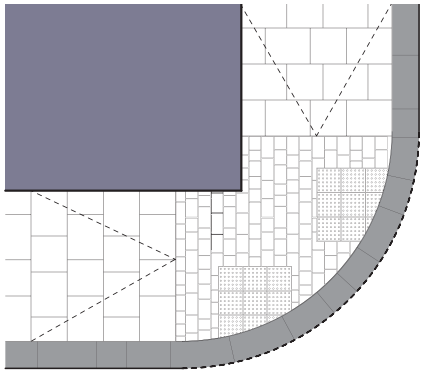
Dropped Crossing, Blacktop in Carriageay

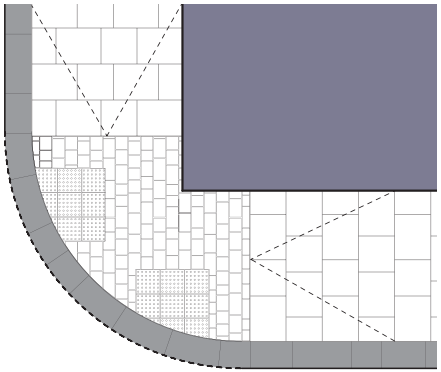
Traditional Street / Traditional Street

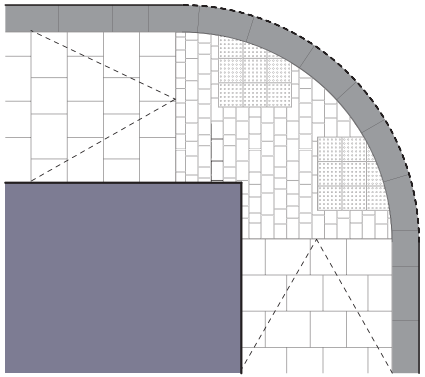
- Blacktop carriageway
- Yorkstone flags (large) on footway
- Yorkstone flags (small) at corner
- Granite blister tactile paving
- Granite standard kerb
- Radius: 4m
- Dropped kerb, nom 5mm lip at crossing and radii

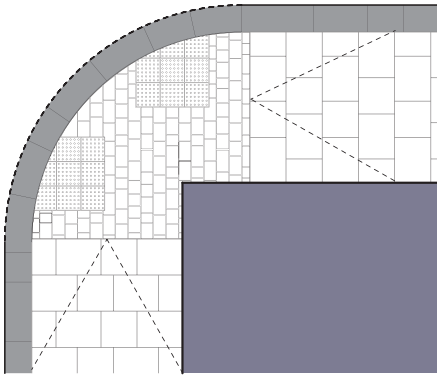
Example:

Great Moor Street / Blackhorse Street,
Bradshawgate / Shiffnall Street,
Brightmet Street / Salop Street,
Folds Road / Kay Street









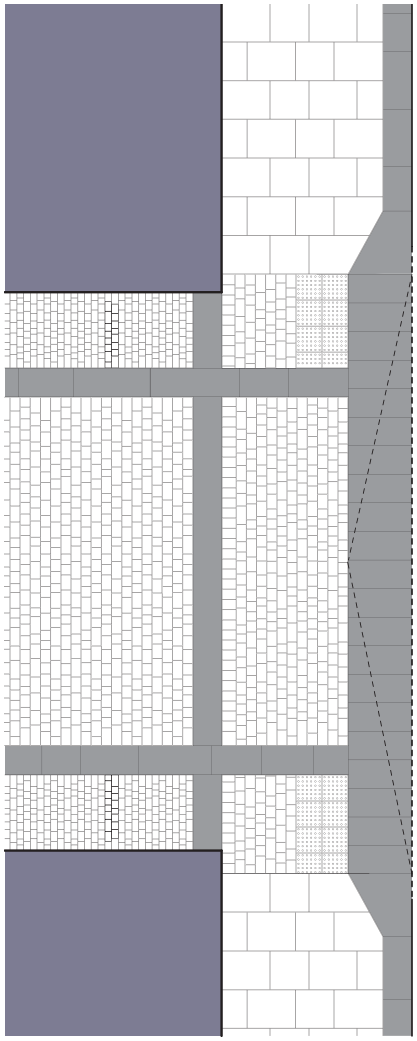
Dropped Crossing, Blacktop in Carriageay

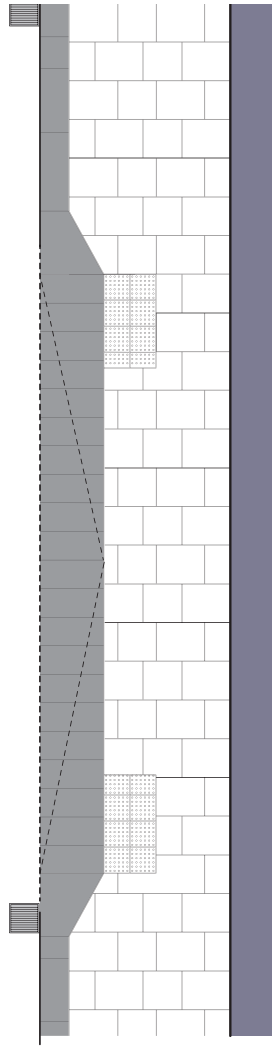
Shared Street / Traditional Street

- Blacktop carriageway at traditional street
- Yorkstone flags (large) on footway
- New granite setts at shared street
- Granite trim at end of shared street
- New granite setts at footway leading to shared street
- Granite dropped kerb for pedestrian crossings
- Granite blister tactile paving
- Nom 5mm lip to kerb at crossing

Example:

Knowsley Street / Bark Street,
Knowsley Street / Corporation Street,
Manor Street / Brown Street,
Bradshawgate / Wood Street,
Great Moor Street / Soho Street



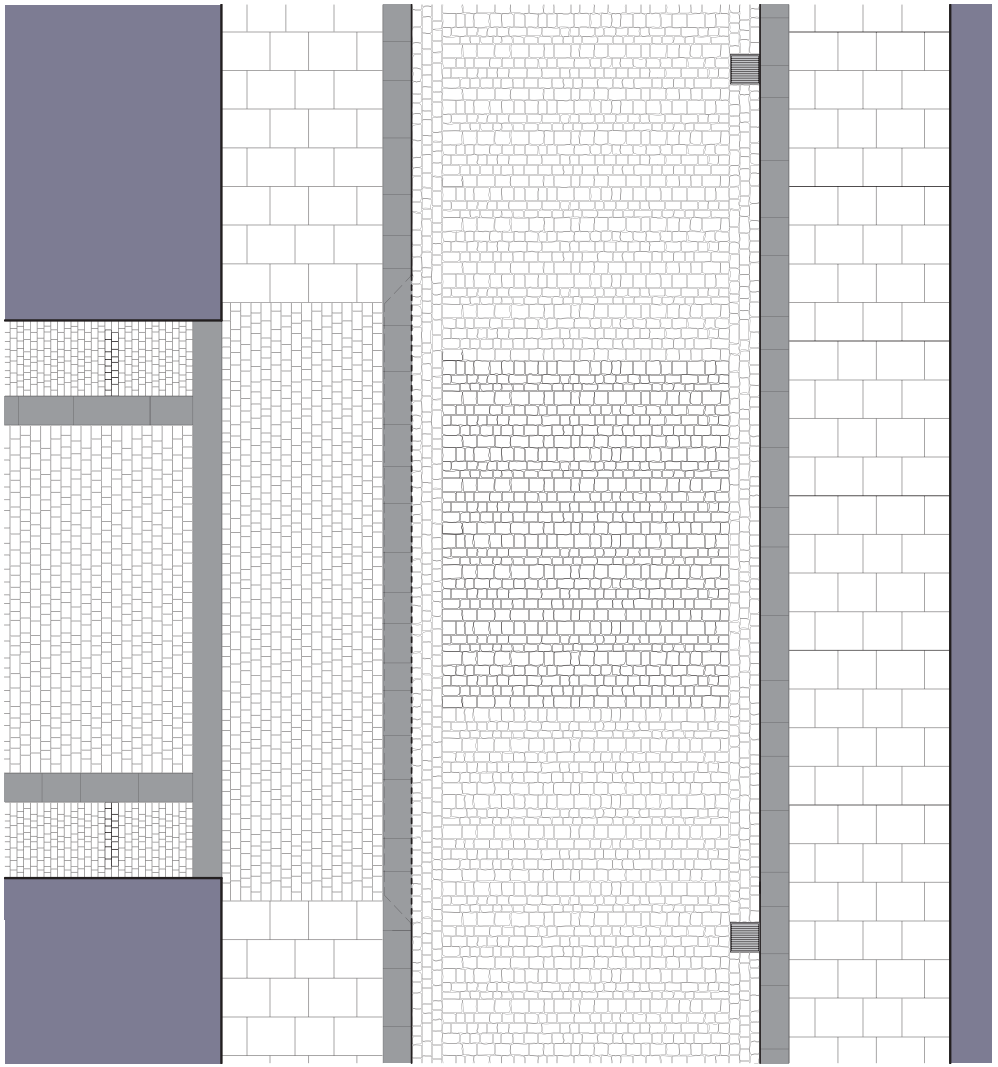


Minor Junction / No Crossing / Vehicle Crossover

- Blacktop or reclaimed setts carriageway at traditional street
- Yorkstone flags (large) on footway
- New granite setts at shared street
- Granite trim at end of shared street
- New granite setts at footway leading to shared street or other vehicle entrance
- Granite chamfer kerb
- Nom 12mm upstand kerb

Example:

Bow Street / Back All Saints Street,
Deansgate / Ridgeway Gates,
Great Moor Street / Chancery Lane,
Knowsley Street / Back Bark Street

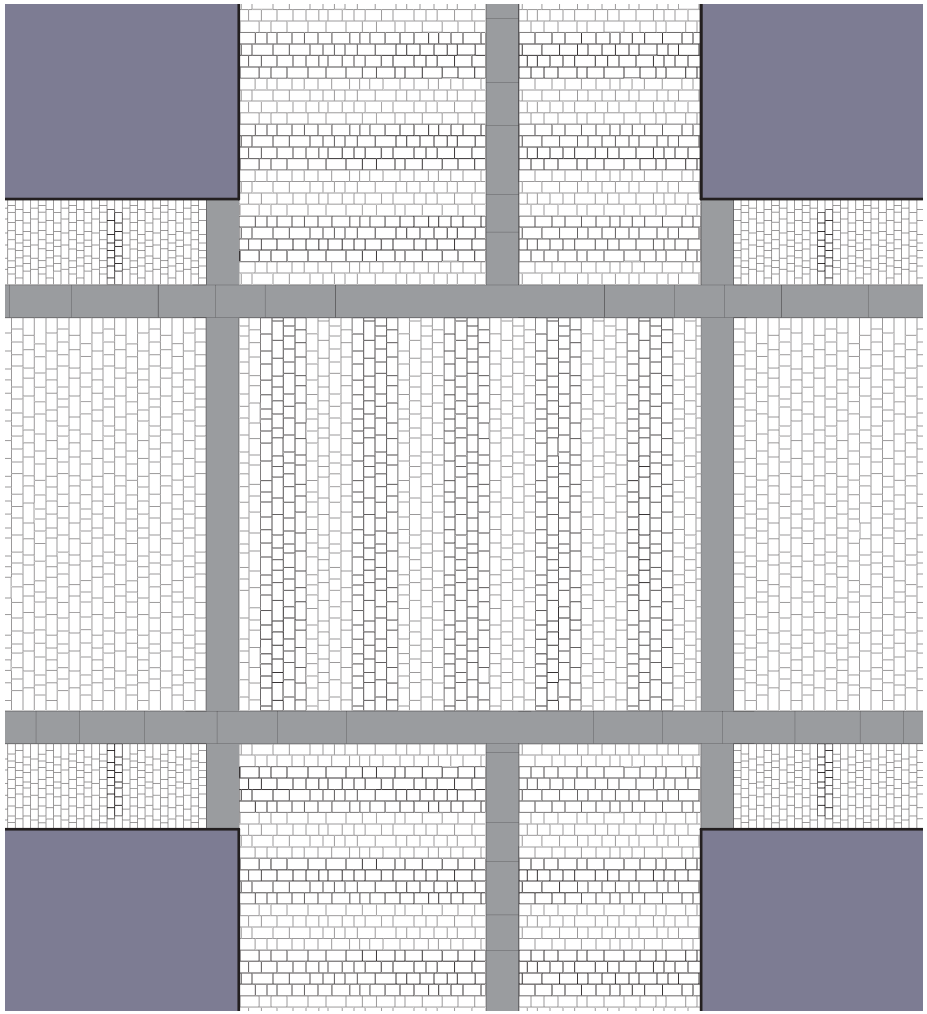


Shared Flush Street / Shared Flush Street

- New granite setts at shared streets
- Granite trim at end of shared street
- No blister tactile paving

Example:

Bark Street / Duke Street,
Blundell Street / King Street,
Central Street / Palatine Street,
Market Street / Corporation Street,
Mawdsley Street / Infirmary Street,
Ashburner Street / Howell Croft South,
Silverwell Street/ Princess Street



04 Surfacing Details

Surface Materials

This section describes the various materials which will be used in the town centre. This can be considered the basic palette of materials which will help to characterise and unify the town centre. In the experience of the present team, these drawings are accurate in describing the surfacing materials suitable for the required performance over time. However, it should be noted that in each instance, the structural design must be determined by the responsible engineer in response to the design brief and, in particular, to the vehicle loadings which are to be accommodated and maintenance requirements.

The proposals for surfacing within 'Site Specific Design Projects' will no doubt include a wider range of materials and methods in response to specific briefs, local circumstances and adjacent architecture / development.

The structural design should also take into account the interrelated issues of:

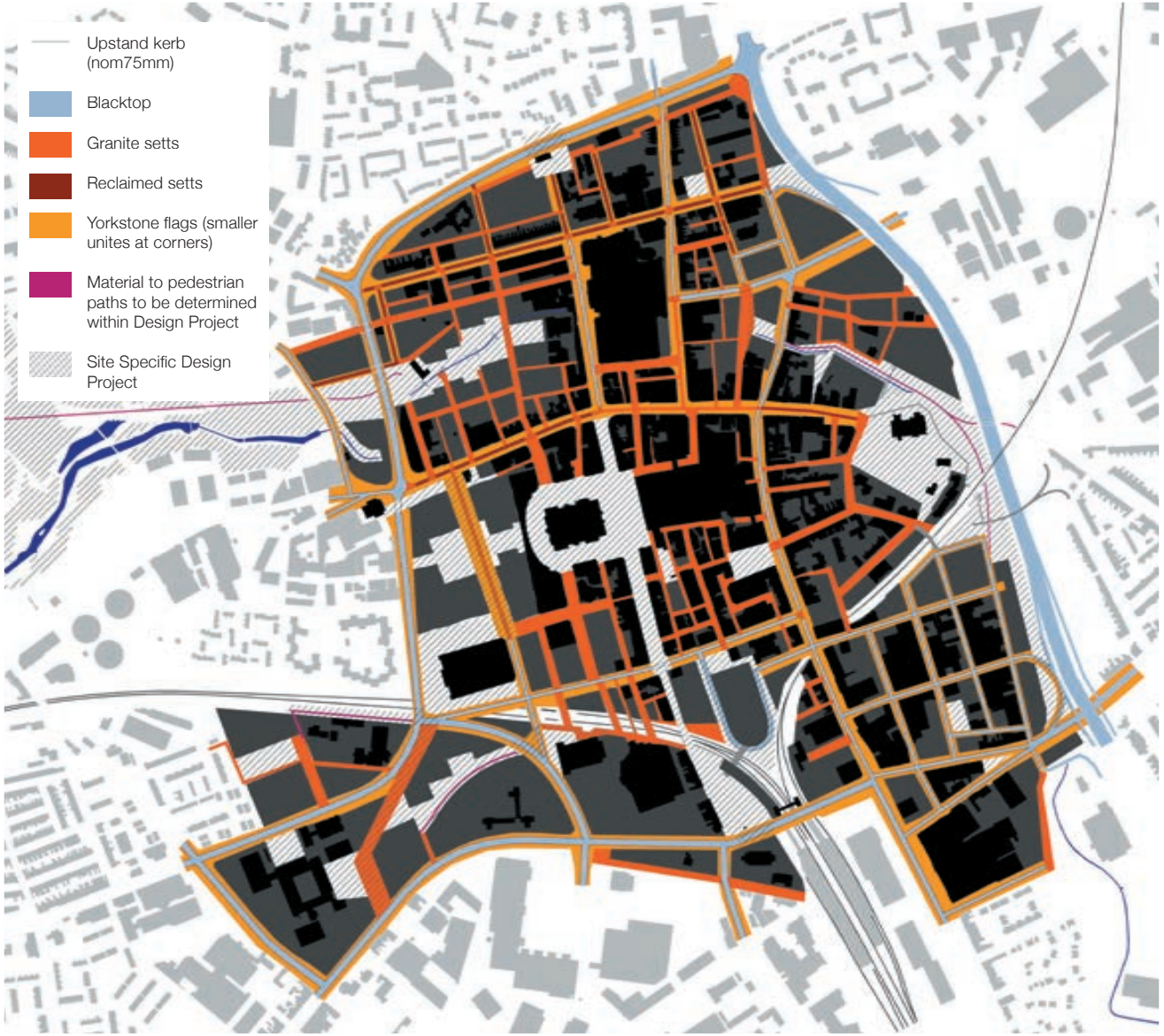
- **thermal movement**
- **construction joints**
- **vehicular and pedestrian access required during construction**

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

- **BS 7533: Part 12**
- **Natural Stone Surfacing : A Practical Guide, 2nd edition by the Society of Chief Officers of Transportation in Scotland (aka 'The SCOTS Guide')**

Surface Materials Diagram

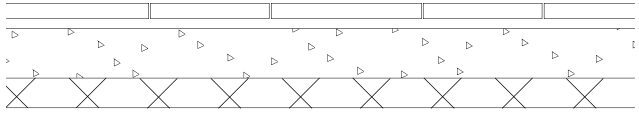
This plan is based on the Street Types Plan and indicative sections and shows the generality of surfacing materials for all parts of the town centre in order to give an overview. Therefore, much important detail (eg. kerbs, channels) is not shown here but can be identified on the sections. The Site Specific Design Areas will have a wider range of surfacing materials. The design of each should respond to the specific brief and will help develop an individual character.



Yorkstone Flags, Large

This is a traditional material for footways. It provides an ideal pedestrian surface with a good combination of accessibility and slip resistance. Not suitable for carriageways or regularly trafficked shared surfaces but can be specified to withstand regular overrun by slow moving vehicles.

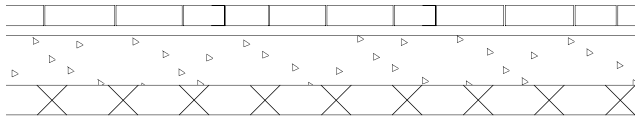
- Yorkstone flags, sawn to all faces. 600mm coursed x random lengths (450-900mm) x 75mm thickness. 5mm joints, pointed flush
- 50mm depth sand / cement bed
- Rigid base wherever there is any possibility of vehicular trafficking. Typically this might be 200mm depth concrete or 250 depth dense bitmac base course
- Sub base



Yorkstone Flags, Small

This material would typically be used where areas of Yorkstone flags are required to have smaller units. For example, at street corners smaller units would be used to increase strength and decrease cutting around complex 3D geometry, dropped kerbs, changes in setting out orientation and the introduction of tactile flags.

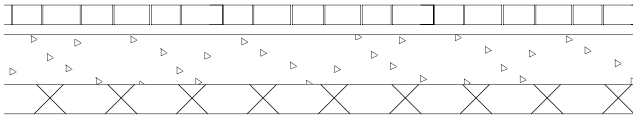
- Yorkstone flags, sawn to all faces. 200mm coursed x random lengths (300-600mm) x 100mm thickness. 5mm joints, pointed flush
- 50mm depth sand / cement bed
- Rigid base wherever there is any possibility of vehicular trafficking. Typically this might be 200mm depth concrete or 250 depth dense bitmac base course
- Sub base



Granite Setts, Small

This material would typically be used in shared surface areas where smaller units are preferred. This could be for aesthetic or practical reasons. For example, at the edges of shared surface streets, smaller units can more easily work around entrances, steps, ramps, cellars, railings, lighting columns etc. The surface would be attractive, accessible and safe for pedestrians. Granite in available in a wide range of colours.

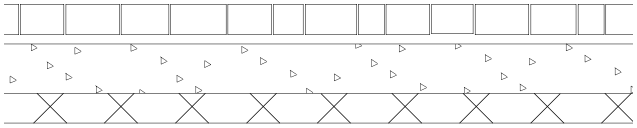
- Granite setts, sawn and flame textured top, cropped to all other faces. 100mm coursed x random lengths (100-250mm) x 100mm thickness. 10mm joints, pointed flush
- 50mm depth sand / cement bed
- Rigid base. Typically this might be 200mm depth concrete or 250 depth dense bitmac base course
- Sub base



Granite Setts, Large

This material would be used in most shared surface areas. It makes an ideally attractive, accessible and safe pedestrian surface and the structure can be designed to accommodate all types of heavy vehicles. However, it would be unsuitable for major heavy vehicle routes. Granite in available in a wide range of colours.

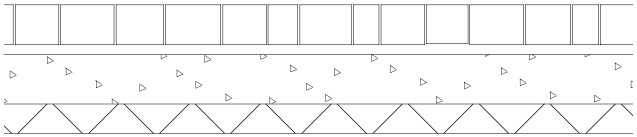
- Granite setts, sawn and flame textured top, cropped to all other faces. 150mm coursed x random lengths (150-350mm) x 150mm thickness. 10mm joints, pointed flush
- 50mm depth sand / cement bed
- Rigid base. Typically this might be 200mm depth concrete or 250 depth dense bitmac base course
- Sub base



Granite Setts, Large (Deep)

This material should be used as a carriageway surface where there will be high frequency trafficking by heavy vehicles, particularly buses. The strength of the base must be determined in response to the vehicle loadings which are to be accommodated. The visible surface can appear to be exactly the same as ‘Granite Setts, Large’ (previous). Granite in available in a wide range of colours.

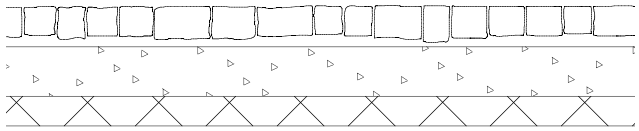
- Granite setts, sawn and flame textured top, cropped to all other faces. 150mm coursed x random lengths (150-350mm) x 200mm thickness. 10mm joints, pointed flush
- 50mm depth sand / cement bed
- Rigid base. Typically this might be 200mm depth reinforced concrete or 300 depth dense bitmac base course
- Sub base



Reclaimed Setts

Reclaimed setts should be used in preference to new sawn top granite setts only where there are compelling aesthetic design / conservation reasons. This type of material is negotiable by pedestrians with no mobility restrictions but will not normally produce a surface which is suitable for all users. Therefore it should be used in a context where there are suitable footways and carriageway crossings with appropriately even finishes. The strength of the base must be determined in response to the vehicle loadings which are to be accommodated. The appearance and quality of the surface will vary and will depend on the character of the material used and the skill of the layers.

- Reclaimed stone setts, variable dimensions. Sorted as necessary to achieve even course widths with nom.10mm joint widths, pointed flush
- Nom. 50mm depth sand / cement bed
- Rigid base. Typically this might be 200mm depth reinforced concrete or 300 depth dense bitmac base course but will depend upon loadings required by the design brief
- Sub base

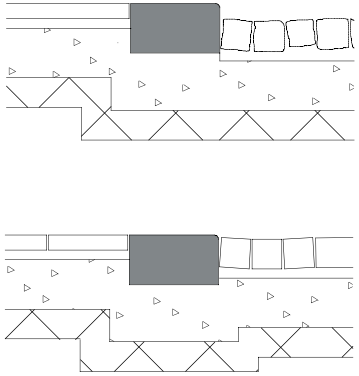


Standard Kerb

This basic 450 x 250 section unit would be used throughout the town centre, adapted as necessary to perform several functions. The 450 width is based on existing old kerbs in Bradshawgate. A standard 75mm upstand is proposed as a good balance between pedestrian accessibility and constraint of vehicle movement. The upstand edge has a 5mm radius (aka ‘pencil round’ rather than ‘bullnose’) so that there is no sharp edge which would be vulnerable to spalling and could cause damage to tyres, wheels etc. A mid grey colour is proposed so as to integrate with various local colour schemes and for cost effectiveness.

It is understood that a 75mm upstand does not allow much, if any, scope for inexpensive resurfacing of the blacktop, ie. not involving planing off. It is recommended that the benefits to pedestrian accessibility are preferable to the advantages of quick resurfacing. Furthermore, it is noted that in any case the detailed channel levels are closely tied to the gully gratings, dropped kerbs, tactile crossings etc.

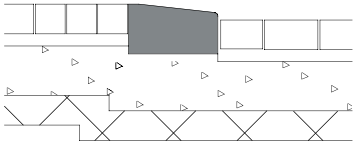
- Granite kerb, 450mm wide x 250mm depth x random lengths (600-1200mm), 5mm rad. to upstand edge. Sawn to all six faces, top and upstand face to be flame textured
- These kerbs can be supplied to a radius run. It is strongly recommended that the radii used in town centre kerb alignments are standardised to 4m and 6m, or similar. Radii of 12m or more can be constructed from straight kerbs



Chamfered Kerb - Vehicle Crossover

This detail is used when a vehicle route crosses over a 75mm upstand kerb and a pedestrian priority route. The chamfer is 1 in 8 over 400mm and easily negotiable by any vehicle. The advantages of this detail are that there is a nom.25mm ‘bump up’, thereby slowing vehicle speed and that the levels at the back of the kerb and the footway surface remain uninterrupted. This emphasises pedestrian priority, facilitates pedestrian movement, makes more elegant streetscape and more durable public realm. The nom.25mm upstand allows a practical degree of tolerance at the channel.

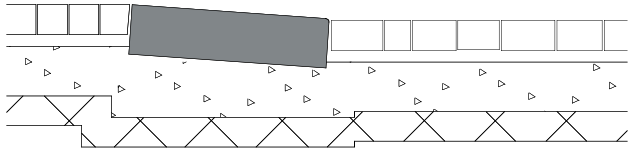
- Granite chamfered kerb, o/a 450mm x 250mm x random lengths (600-1200mm). Chamfer 400mm x 50mm, therefore 1 in 8 gradient. 5mm radius to leading edge. Sawn to all faces with flame textured top, upstand and chamfered face. Handed transitions are required



Dropped Kerb - Pedestrian Crossing

This detail is used when a line of pedestrian movement crosses a 75m upstand kerb. In order to make a gradient suitable for all users, the rise cannot be accommodated within the standard 450mm kerb width. Therefore a 1000mm ‘wide’ unit is introduced, giving a gradient in excess of 1 in 14. The 450mm standard dimension is maintained in the ‘length’ of the stones. The 5mm radius at the leading edge is durable and allows for the required 0-6mm lip between the channel and the kerb. This is essential to give buildability tolerances and to keep surface water in the channel. Handed transitions are required.

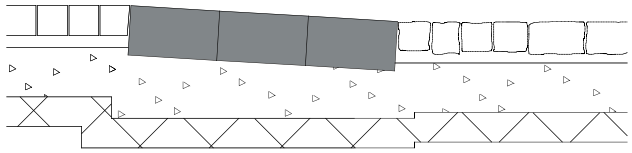
- 1000mm ‘wide’ x 450mm ‘long’ x 250mm thickness dropped kerbs. 5mm radius to leading edge. Sawn to all faces, flame textured top



Ramp to Raised Pedestrian Crossing

This detail is used where there is a raised crossing or raised junction to a carriageway with 75mm upstand kerbs. The ramp is formed from three courses of 450mm x 250mm stones laid in an irregular stretcher bond. Each course must be rolled over the camber longitudinally. The gradient of the ramp is 1 in 18, easily negotiable but sufficient to achieve a traffic calming effect. Raised crossings / junctions should be min. 7m length so that the back wheels of a bus are onto the table before the front wheels move off it.

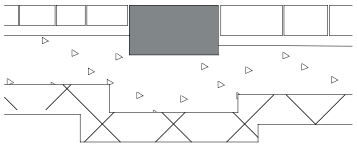
- Ramp stones, 450mm wide x 250mm thickness x random lengths (600-900mm). Sawn to all six faces, flame textured top



Flush Trim / Channel

This detail is used where there is a surface water channel within a pedestrian or shared surface area. There should be a small 0-6mm lip to the sides of the channel to contain surface water flows and help avoid ponding beyond the channel itself. A dished channel is an option but is not preferred because it would hinder mobility for some users. Granite would be used in areas trafficked by vehicles but Yorkstone should be used within Yorkstone flagged footways.

- Granite flush trim, 450mm wide x 250mm depth x random lengths (600-1200mm). Sawn to all six faces, flame textured top



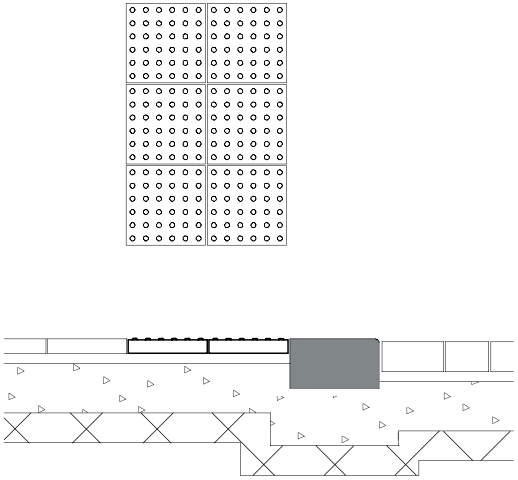
Tactile Paving

Blister tactile flags should be produced from granite with the blisters milled to the profile and layout specified in the DfT ‘Guidance On The Use Of Tactile Paving Surfaces’.

Red granite should be used at controlled crossings. Buff granite, to complement adjacent yorkstone flags, should be used at uncontrolled crossings.

Yorkstone blister tactile flags have been considered but the sedimentary nature of the material is susceptible to the blisters being damaged.

The flags should be laid with the same construction as the surrounding surfacing and with a minimum of cuts to incorporate the pattern.



Pedestrian Paths

This refers to pedestrian routes which are remote from squares, streets and roads. Most, if not all, of these fall within Site Specific Design Projects. As such they should be designed in response to specific briefs and budgets.

Unless there are good reasons otherwise, the general approach should aim to achieve a surface which is visually strong, cost effective and practical to maintain. Therefore wide granite trims should be used at the sides. These should be flush so as to avoid creating channels and the need for an active drainage system. Hot rolled asphalt or bitmac can be used for the pedestrian surface. This could have aggregates rolled into the surface at low density. This type of flexible bound finish suits curved and undulating layouts, is easy to maintain and resurface.

Resin bound aggregates and epoxy applied surface dressing should be avoided because they are relatively very expensive and impractical with regard to future matching and patching.

Gully Grating

Standard ductile iron road gratings should be used in blacktop carriageways.

Where the channel is formed with three courses of new granite setts, 470mm x 470mm (o/a outside top of frame) should be used (3no. x 150mm courses plus 2no. x 10mm joints = 470mm). The frame must be 250 depth so that adjacent setts do not have to be cut to sit over the flange. If such ductile gratings are not available, then suitable class D gratings can be fabricated from mild steel and galvanised.

Where gullies are located continuous with flush 450 wide granite channels, the gratings must be the fabricated mild steel galvanised type. The o/a outside top of frame size must be exactly 450mm x 450mm so that adjacent materials are not cut and packing is not necessary. The frame depth must be 300mm in order to accommodate the full depth of the adjacent flush channel block above the flange. This frame depth can be less if shallower channel stones are used in Yorkstone footways.

Covered Channels

The term ‘covered channels’ is taken to mean various solutions which take the flow in the channel to below the surface. Most options can include a fall in the channel underneath which is independent of the surface falls. These are available in various forms including:

- **Metal gratings or perforated plate**
- **Infill grating trays**
- **Slotted**

Covered drains of any type should only be used when necessary, ie. in a situation where a channel has to be located such that no effective long fall an be achieved without creating unacceptable crossfalls. This is because experience indicates that maintenance of covered channels tend to be insufficient to prevent the channel from filling with debris so that the system becomes ineffective.

Where covered channels are necessary, it is recommended that there should be a system with ductile iron gratings over a U-shaped channel with built in falls, specified at nom. 300mm wide and heavy duty, for the following reasons:

- The gratings will be durable and will improve in appearance with age
- The wide channel will be less susceptible to silting up with debris
- Any blockages will be visible from the surface
- Blockages will be easy to remove by local lifting of gratings
- There will be no roding of unseen blockages

Service Covers

Yorkstone flag footways, which will not be habitually overrun, should have infill type service covers. These should be fabricated from mild steel, galvanised and specified to appropriate standards. Particular attention should be paid to the frame depth (see below) and the weight of the covers when filled with yorkstone. Smaller covers in footways (nom. 250mm x 250mm) can be ductile iron as below.

All other areas (ie. carriageways, shared surfaces and footways which will be frequently overrun) should have class D ductile iron covers. Experience indicates that infill type covers will fail when trafficked by vehicles.

All new covers, whether fabricated or ductile iron, should be specified with frame depths sufficient for adjacent surfacing stones to be laid over the flange without cutting or wide joints at the surface. Cutting of stone setts or flags around shallow cover flanges increases cost and introduces structural weakness where durability is particularly important.

Laying of stone materials around covers and for infills must be specified so as to achieve the same joint widths as the surrounding surfacing, including against frame edges. Wide joints around covers looks poor and draws attention to the covers.

It should be assumed that all covers, even if not replaced, will at least be reset to new stringlines with the new adjacent surfacing. All plastic and concrete covers should be replaced wherever possible with infill type or ductile iron.

The specification of all covers and the procedures for all works to service providers apparatus should be agreed with the service providers well in advance of the commissioning of the works.

05 Design for Traffic

Public Realm and Traffic Issues

It is beyond the scope of this report to make proposals regarding TROs. However, the physical appearance of a street, the TRO and public behaviour are closely interrelated issues. The notes below refer to some of the traffic management concerns which relate to public realm design.

Carriageway and Footway Dimensions Generally

Footway and carriageway widths will vary according to circumstances. Whilst standardisation is highly desirable, this is difficult to achieve in practice due to the many conflicting design criteria which vary across the town centre. Instead of prescribing rigid dimensions for each category of carriageway, this report sets out guiding principles based on DfT standard practice and the particular circumstances of the town centre public realm. It is intended that the design team for implementation schemes will interpret these in each instance to produce the optimum balance between public safety, pedestrian amenity, vehicle flows and townscape quality.

Footways should be 3m min. width where possible as a priority. This should have precedence over the inclusion of bus lay-bys at bus stops.

Most carriageways in the town centre should be able to be designed within the following dimensions:

- Standard vehicular route, where one way traffic – 3m to 4m
- Standard vehicular route, where two way traffic – 4.5m to 7m
- Bus route in bus contraflow, allowing for cyclists – 4m to 4.5m
- 'Public' vehicular route in contraflow, allowing for cyclists – 3m to 3.5m

The dimensions above allow for the carriageway to be shared with cyclists. The following factors should be considered in the design of carriageway dimensions:

- Reduced widths tend to reduce vehicle speed
- Reduced widths will increase the tendency for vehicles to overrun footways. Therefore, the footways should be either protected or designed to withstand overrun
- A curved alignment will tend to reduce vehicle speeds
- A curved alignment will require more space for vehicles to manoeuvre

Public Realm and Traffic Issues

Design of the Bus Gyratory

The proposed bus gyratory will consist of a single one way anticlockwise lane. The width will vary as described previously. Radii along the bus route should be 6m, where practical, to allow the footpath to be as spacious as possible. Where this is not possible for safety reasons, the radii should increase, but not in excess of 10.5m. The bus lane, where within in a traditional street with upstand kerbs, should be surfaced with blacktop. There are four exceptions to this:

- Deansgate (Knowsley Street / Blackhorse Street) – traditional street with upstand kerbs but carriageway surfaced with reclaimed granite setts
- Deansgate (Bradshawgate / Bridge Street) and Bridge Street (Deansgate / Bow Street) – flush shared surface with carriageway paved with new sawn top granite setts
- St George's Road (Bridge Street / Knowsley Street) – traditional street with upstand kerbs but carriageway surfaced with reclaimed granite setts
- Blackhorse Street – might well be similar to western end of Deansgate but will depend on how the SSDP design is developed

In all parts of the town centre, red coloured surfacing would become an unnecessary maintenance liability and would in any case detract from the streetscape. Therefore it is not recommended.

The bus lane is separated from the opposite traffic by a continuous white line. Where access into / out from the gyratory bus lane is provided, the line should be broken to allow traffic to enter / exit. At other junctions with the gyratory, the continuous line should remain unbroken to signal no entry for vehicles. 'One way' and 'Left (or Right) only' signage are also needed to inform drivers about the restrictions. The wording 'BUS LANE' should be provided at entry points into the bus gyratory and at 300m intervals.

It might be possible to avoid the necessity for yellow lines in the bus lane on the basis that it will be used only by buses at all times. However, this remains to be tested but is desirable. Generally, signing and lining should be reduced to a minimum as a matter of principle in order to reduce visual clutter.

Bus stop lay-bys are desirable generally in order to maintain bus flows. The usual argument against bus stop lay-bys (ie. that buses will be impeded from exiting bus stops by other traffic not giving way) will be largely offset in this case because there will be only bus traffic on this route. However, the inclusion of any bus stop lay-by should depend on the balance of benefits in each instance, considering the following:

- Width of footway (min. 3m where possible)
- Pedestrian flows on footway
- Numbers of passengers using the stop
- Numbers/ frequency of buses stopping
- Numbers of different bus routes using the stop
- Overall 'architectural' public realm design issues

The width of a bus lay-by should ensure that a bus can pass on the adjacent carriageway whilst a bus is stopped. The length should accommodate a bendy bus.

Public Realm and Traffic Issues

Shared Surfaces and Pedestrian Friendly Environment

The success of the town centre as place for pedestrians to move through and gather depends a great deal on how safe and comfortable they feel. At its simplest, the public spaces will not be attractive for pedestrians to linger if the vehicle traffic is too heavy or too close. As set out in the Public Realm Strategy, these proposals seek, as a matter of priority, to adjust the balance in favour of the pedestrian to extend the pedestrian friendly environment from the existing nucleus in the core area to dominate the whole town centre. This is in accordance with transportation strategy and would have a profound effect on the future success of the town centre. It is important to understand that the public realm imperative is not to increase restrictions to prevent vehicle access, but to design the streets so that driver behaviour is safer for pedestrians.

The Spatial Types Plan shows most of the streets within the central area as shared surface. Whilst this is what most people would call ‘pedestrianised’, it is intended that a range of service and maintenance vehicles, and vehicles accessing property, will move through these areas from time to time, to a greater or lesser extent, depending on circumstances. Experience elsewhere shows that if the spaces are designed uncompromisingly as pedestrian areas, drivers will moderate their behaviour and drive slowly and safely in this alien environment.

Vehicle access to shared surface areas will be restricted in various ways, eg. time restrictions, access only, buses only.

Streets with a formal carriageway must be designed in detail for safe and comfortable use by all users. Relatively narrow carriageways and tight corner radii will reduce vehicle speed. The presence of an upstand kerb to carriageways is an aid to navigation to those with severe visual impairment. However, a relatively low upstand (75mm) eases the obstruction to all other users. The most basic principle here is that the spaces are designed to be intrinsically safe rather than concentrating on mitigating hazards in an inherently dangerous place.

All of these public realm proposals assume that the Bolton Council aspiration for a 20mph speed restriction for all parts of the town centre will be enacted and that this TRO will be enforced. Furthermore, the proposals are intended to reduce traffic speed by design. Detailed design of the streets should ensure that the layout and materials have a traffic calming effect.

Controlled Parking Zone

In order to reduce signage and lining, every opportunity should be taken to introduce a Controlled Parking Zone (CPZ) inside the outer highway box. CPZ signage will be required at all entrances and exits to the area. The number of parking bays, if any, should be very restricted because most parking will be provided in the proposed multi level car parks. The CPZ also restricts loading, depending on the details of the order. Whilst it is beyond the scope of this report to make detailed proposals, the avoidance of much signage and lining clearly has great townscape advantages.

Public Realm and Traffic Issues

Protection of 'Footways'

The introduction of more shared space does allow vehicle access to areas which were previously footway. Similarly, the reduction of upstand kerbs to a more pedestrian friendly 75mm increases the likelihood of vehicles mounting the footway, particularly if carriageway widths are reduced also. The nature and extent of any potential problems arising from this will depend on the circumstances in each case. The design team for each scheme might consider the following:

- If vehicle speeds are low, then pedestrian safety tends not to be a problem
- The structural design of footways should accommodate vehicle overrun
- Service chambers, covers and depths often need to be upgraded when footway areas become shared surface
- Cellars to adjacent buildings sometimes have to be protected from vehicle overrun if weak or in poor repair
- When upstand kerbs are removed to make a shared space, the lining of the 'carriageway' with bollards for 'pedestrian safety' and to protect the footway tends to be retrogressive. The bollards impede movement, clutter the streetscape and are an expensive maintenance liability
- A better approach is to deal with services and cellar issues where possible and use bollards locally to protect where not, if only temporarily

Controlled Crossings

As a general rule, controlled crossings should be continuous with the line of movement and straight across the carriageway. Pedestrian islands and staggered crossings should be avoided and it should be possible to cross the full width of the carriageway in one go. Traffic should stop in both directions. Guardrails should be avoided as discussed elsewhere.

Loading Bays and Taxi Ranks

There are two basic options for the incorporation of loading bays and taxi ranks. The choice of approach depends on the circumstances of each scheme:

- The width of the footway (3m prefered as a priority) and the volume of pedestrian traffic
- Traffic flows in the carriageway
- The expected amount of loading / taxi activity, taking times into consideration

Option 1

Loading and taxi facilities are provided in lay-bys where required. The lay-bys are flush with the footpath and vehicles bump up a chamfered kerb (see detail in Section 4). When the bay is not in use, it contributes to better space for pedestrians.

Option 2

Loading and taxi facilities are provided in marked bays in the carriageway. The footway will therefore remain continuous and uninterrupted for its full width. When loading or taxi activities occur the carriageway will be restricted, normally allowing only one vehicle width to pass. This will have a traffic calming effect.

06 Furniture

Recommendation of Products and Suppliers

Where specific products and suppliers are recommended, it is advised that these are specified with a supply option for ‘or similar approved’. The fabricator / supplier should be contractor choice. Most contractors will be able to source acceptable equivalent alternatives to most of the named products. It is strongly advised that particular suppliers are not nominated in public realm implementation contracts.

Traditional Bench Seats

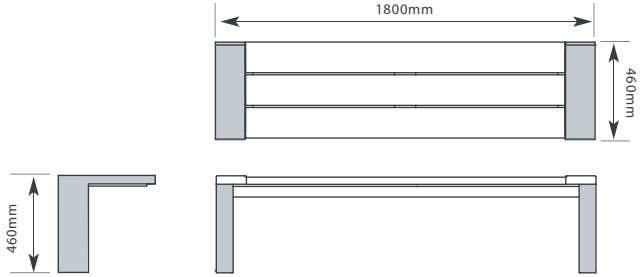
Most of the seating in the town centre will be in the form of traditional bench seats with hardwood slats on a steel frame. There should be a standard type for use in the town centre for visual continuity, to ease maintenance liability and to set a quality benchmark for public and developer schemes. There have been different types used in recent decades with varying success. There is now general officer consensus that a new type should be now established as the standard for the town centre. The Omos Bench Seat is recommended for the following reasons:

- It has a traditional form but also a clean contemporary design which will suit all situations
- The Iroko hardwood boards are comfortable (not as cold as granite) and very durable
- The two leg design will not unduly impede mechanical and manual sweeping of the surrounding surfacing
- There is a simple bench version, with no armrests or back, which will be suitable in some locations

As supplied by

Urban Elements
Glebe Farm
Cross Street
Barrow on Humber
DN19 7AL

tel 01469 533 253
www.urbanelements.co.uk
info@urbanelements.co.uk



Seating in Site Specific Design Projects

The squares and green spaces within the town centre will need a high capacity for seating. Much of this will be traditional bench seats. These places will also offer a variety of informal alternatives such as terraces, steps and walls. Further to this, there is an opportunity for bespoke seating to designed as an integral part of each scheme. This has the potential to greatly enhance the architectural quality of the public realm and contribute towards a distinct character for each space.

Experience indicates that granite, stainless steel and highly durable (normally imported) hardwood are suitable materials. Seating constructed from these materials, if suitably detailed, will be extremely robust and readily maintainable. They are 'self finishing' materials, requiring no recoating of any kind and are suitable for the removal of paint and markers with chemical means or abrasives. Furthermore, these materials offer a great deal of scope for the design of very high quality and elegant furniture.

Town centre furniture should not be constructed from less durable stone, indigenous hardwood in small sections, softwood or any metal that requires an applied finish.

The design of bespoke seating should consider the following factors:

- Spaces should contain a reasonable measure of seating which complies with the DDA. Depending on the quantity and layout of traditional bench seats, bespoke seating might or might not be required to comply with DDA
- There should be a range of seating of different heights and located to suit all parts of the community
- Seating should be located to take advantage of sunny aspect. Potential use at different times of day will vary
- Seating should be designed to shed water and be as 'self cleaning' as possible, avoiding details which trap or collect litter, debris etc
- The seating should not create undue difficulties in the cleaning / sweeping of surfacing around and underneath
- Any lighting under the seating must be suitably accessible for maintenance and yet sufficiently inaccessible / robust / protected to resist casual and determined vandalism
- The seating should be replaceable in case all or part becomes damaged
- The materials / finishes must be readily cleanable and suitable for the removal of graffiti etc

Litter Bin

Derby Round Stainless Steel Litter Bin (BX50 2554-SS)

The recommemded litter bin is a smart, contemporary and unfussy design. Following consultation with Bolton Council Officers on practical issues, the bin shown is proposed because it will be easy to use and relatively simple to maintain. It is suitably robust (the wall thickness has been increased from the standard 2mm). Two sizes are proposed. The larger size would be in busy central areas. Smaller bins would be located in quieter outlying areas and where space is restricted.

Technical information

- 3mm thickness Grade 304 stainless steel
- 8mm thickness base
- No mild steel components
- Heavy duty front opening door
- 20mm heavy duty stainless steel pivot hinges
- Standard hand polished finish with clear powder coat protection
- Two posting apertures
- No writing
- Plastic liner with two handles
- Liner and bin to be free draining
- Stainless steel slam lock mechanism
- Hexagonal key operated heavy duty lock
- Same key for all bins
- Four fixing holes in base
- Ash tray top included
- 130 litre and 80 litre sizes

As supplied by

Broxap Ltd.
Rowhurst Industrial Estate
Chesterton
Newcastle-under-Lyme
Staffordshire
ST5 6BD

tel 0115 978 4115
www.broxap.com
enqueries@broxap.com

Recycling Bin

The provision of recycling bins in key locations in the town centre will assist in the practical aspects of waste management but, perhaps more importantly, it will deliver a strong message to the public on the importance of recycling and Bolton Council's commitment to it.

It is proposed that recycling bins are installed in the following locations:

- 2 no. in Victoria Square
- 2 no. in Newport Street, pedestrianised area
- 1 no. in Deansgate
- 1 no. in Churchgate
- 1 no. in St Peters Churchyard

The recycling bins should meet the following design criteria:

- Each unit to contain three bins : glass, plastic and metal cans
- The design should complement the stainless steel litter bins and other street furniture
- The various labelling should be clear and prominent
- Each should have 3 x 120 litre bins, compatible with the collection plant. (3 x 240 litre bins would entail a huge overall container which would be incompatible with the town centre locations)

Bollards

The most important issue with bollards in the public realm is that they should only be installed when strictly necessary and when there is no viable alternative. They can be useful in certain circumstances but are an impediment to pedestrian movement and impact visually on the streetscape. Furthermore, they are a considerable maintenance liability. When a bollard is nudged over by a vehicle, much remedial excavation and reinstatement of surfacing has to be carried out.

It is also important to install only standard bollard types in the town centre to assist maintenance. Two bollard types are recommended. One of these is the cast iron 'Blackburn' type which has already become standard in Bolton. The other is a tubular stainless steel alternative where a contemporary design is more appropriate. The stainless steel bollard has the advantage of never chipping or needing to be repainted. The 5mm wall thickness is an increase on the standard product.

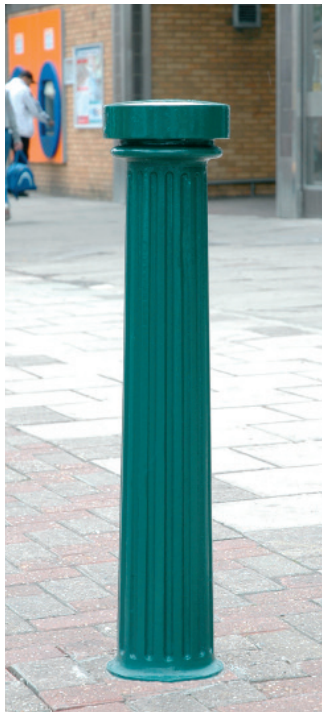
Both types as supplied by

Broxap Ltd.
Rowhurst Industrial Estate
Chesterton
Newcastle-under-Lyme
Staffordshire
ST5 6BD

tel 0115 978 4115
www.broxap.com
enqueries@broxap.com

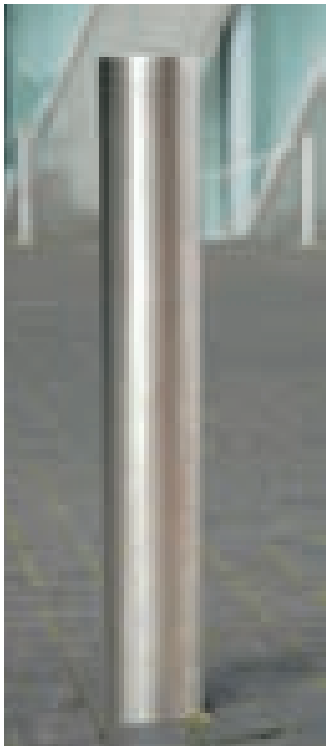
Cast Iron Type

Blackburn, BX 1520



Stainless Steel Type

Sheffield Range, BX47 0140 00-RT



Cycle Racks

BX/MW/SPS Harrogate

Techinical Information

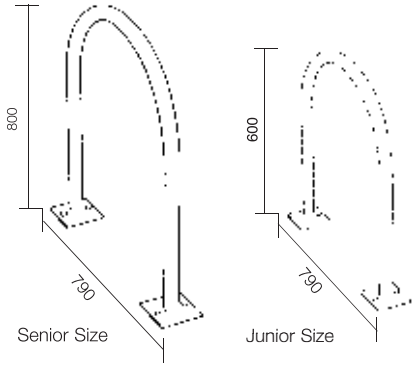
- This popular tubular cycle stand allows the bike's frame to be secured by the users own lock
- Stainless steel
- Duracast is an engineering grade polyurethane which is rust andcorrosion resistant and virtually maintenance free. As it is a polymerit provides maximum protection against damaging the bikes frame
- All versions available. Base plate or submerged fixed

There might well be situations, particularly in Site Specific Design Projects, where cycle lockers are appropriate. Key issues with the provision of cycle lockers are security, available space and the use of a standard design which is in keeping with the stainless steel finishes to other town centre furnishings.

As supplied by

Broxap Ltd.
Rowhurst Industrial Estate
Chesterton
Newcastle-under-Lyme
Staffordshire
ST5 6BD

tel 0115 978 4115
www.broxap.com
enqueries@broxap.com



Other Furniture

Pedestrian Signage

Signage in the town centre for pedestrians takes two forms.

Firstly, the tourist information signage is in the form of large panels with annotated maps showing street names, places of interest and navigational landmarks. These should be gradually increased in number as the high quality public realm expands and should be located in all of the major spaces, at key pedestrian nodal points and, especially, at points of arrival in the town centre. In the future, these will include the proposed multi-level car parks. The maps should be designed with user friendly graphics (most people are not used to reading plans) and in a format which can accommodate regular upgrading as the town centre develops.

Secondly, navigational finger posts should be located on the major pedestrian routes and particularly where these intersect. They should contain directions to the major spaces and buildings, to the different parts of the town centre and to the various elements of the integrated transportation system.

The design of the finger posts should complement the contemporary and unfussy appearance of the other town centre furniture. Complex designs tend to be expensive and difficult to maintain. The location of finger posts is often problematic. They need to be visually prominent and on busy lines of movement and yet should not restrict movement unduly. Furthermore, they are particularly vulnerable to impact from delivery and maintenance vehicles in pedestrianised areas.

Columns and Poles

All lighting columns, illuminated traffic sign columns, traffic sign poles, traffic signal control posts etc. should be black. These can be either specified supplied with a polyester coating (or similar) or painted black.

The number of columns and poles should be reduced to an absolute minimum. This will reduce visual clutter, ease pedestrian and vehicular movement and reduce maintenance liability. The design process for each scheme should seek to:

- Reduce traffic signage to a minimum whilst maintaining TRO enforceability
- Employ columns / poles for multiple uses
- Specify and locate columns / poles with sensitivity to architectural and adjacent land use issues
- Standardise the design of columns / poles as far as possible
- Mount signage and lighting on adjacent buildings where appropriate

Other Furniture

Guardrails

The use of pedestrian guardrails in the town centre should be reduced to a minimum, if not stopped altogether. Recent study indicates that pedestrian guardrails increase vehicle speed, decrease driver awareness and thereby reduce pedestrian (and motorist) safety. Furthermore, the installation of guardrails promotes a public realm architecture dominated by major roads rather than creating a pedestrian friendly environment. Whilst it is clearly beyond the scope of this report to analyse and make detailed and substantiated proposals regarding the use of guardrails, it should be noted that there are now increasingly compelling reasons to reappraise the use of pedestrian guardrails, particularly within town / city centres.

Electrical Supplies in the Public Realm

Electricity supplies in the public realm can be very useful for a wide range of activities, including special events, performance, markets, street trading and lighting displays. The nuisance and health and safety issues associated with generators are avoided.

The most practical way to provide these supplies is with metered sockets of appropriate IP rating located in free draining concrete ring chambers. These should be located in footways / shared surfaces or public spaces. Ductile iron covers can be slotted at the edges as necessary to allow cables to pass through when the covers are in place.

The type of supply, meters etc. would all need to be agreed with the electricity supply provider, following an assessment by Bolton Council of what the supplies will be required for. There will need to be procedures in place to ensure adequate health and safety for users and to allow payment by users for energy used.

Supplies from feeder pillars might also be appropriate where feeder pillars can be located usefully without using causing undue obstruction.

Proprietary ‘pop-up-power’ type supplies have been considered but are not recommended for the following reasons:

- They are relatively expensive to install
- The underground structures are huge
- Repair is expensive in the event of damage or malfunction
- Covers can be difficult to adjust to surface falls
- Typically, the supplies can be used only in the upright position, thereby causing an obstruction

07 Lighting

Generally

Lighting Standards

Bolton Council's Environmental Services Department released 'Pedestrian Access & Mobility: A Code of Practice' design guide in July 2005. This document refers only to BS5489 when detailing road lighting schemes. However, following consultation with both the Operations Project Team and Highways Design Team, it has been agreed that all future lighting is to confirm with BS5489 EN13201.

Style of Lighting Columns

All new lighting columns should be of contemporary design as shown in the specification. The existing 'decorative' street lightings columns situated within conservation areas and historically important parts of the town centre (eg. Wood Street) should be retained at this time. However, new lighting columns of a more contemporary design should be considered once the existing columns need te be replaced. These replacement columns should be good quality, contemporary and as discrete as possible. New 'pastiche' style lighting columns should be avoided in the future.

Lighting Calculations

Bolton Council uses "Calculux" and "Lighting Reality" lighting software packages to carry out a double verification of any outside lighting designs. It is essential that any public realm lighting proposals which are not designed by the Council must have the lantern data file submitted for formal approval in one of the following formats : IES, TM14 (cib) INR or Eulumdat.

Light Pollution

Light pollution is essentially artificial light that is allowed to illuminate areas that were not intended to be lit. A good quality lighting scheme relies on the designer to understand these issues and specify the correct luminaires for the job.

Intrusive light is caused by over-bright or poorly directed lights shining into onto neighbouring property. This affects the neighbours right to enjoy their own property. Surface mounted lanterns (requiring wayleave agreements) are often the source of much irritation to those living within the said building. It is therefore essential that everything is done to help reduce such problems. For example, the simple addition of an anti-glare louvre will assist with reducing intrusive light.

Skyglow is the orange glow seen above urban centres. The majority of this lighting is caused by highway lighting columns with poor optical control. For this reason 'flat glass' lanterns are proposed throughout Bolton because these fittings help minimise light pollution, glare and intrusive light.

Inconsiderate or incorrectly set lighting can cause unwanted **glare**. Glare occurs when the excessive brightness of a light source against a dark background interferes with a person's ability to view an area or object. Glare can detract from the architectural appearance of a building and even lose complex or attractive features. It can also impact seriously on the wildlife and ecology of an area. Furthermore, it is a waste of energy, resources and money.

Luminaire Specification Sheets

Description:	Lantern (for Metal Halide lamp)
Lantern Type:	Flat Glass
Lighting Requirements:	BS5489 EN13201 If desired standards can not be achieved as a result of limited design positions then a "bowl glass" lantern can be considered. (For example; setting out locations for way-leave agreements with property owners).
Control Gear:	Electronic DIMMABLE control gear
Control:	Integral electronic timeclock/photocel.
Lantern Colour:	Black Unless it is deemed necessary to match that of the surrounding landscape furniture such as railings, feeder pillars, bollards, etc. Design team to advise when appropriate.
Recommended Manufacturers: (in alphabetical order)	CU Phosco 01920 860 600 DW Windsor 01992 474600 Phillips Lighting 01293 776774 Urbis 01256 354446 Sugg Lighting 01293 540 111 WRTL 0121 521 1234
Lamp Type:	Ceramic Metal Halide
Colour Rendering Index (Ra):	80-100 80 is the minimum requirement
Lamp Colour Temp (k):	2800-3300 (Warm White)
Lamp Life:	Currently 12,000 – 15,000 hours
Proposed Manufacturers:	Philips: 020 8665 6655 Osram: 01744 812221

The following specification is an example of a luminaire type that meets ALL of the design criteria set out within this document. This specification is indicative and is intended as reference only.

Description:	Highways "flat glass" Lantern with dimmable electronic control gear for Metal Halide lamp
Luminaire Cat. No.:	Milewide SRS419/421/427
Description:	Highway lantern with integral dimmable electronic control gear and photocell
Dimensions:	Length: 488mm, Width: 234mm, Height: 167mm
Mounting:	Side entry mounting to column
Colour:	Black. RAL9005
Manufacturer:	Phillips Lighting 01293 776774
Accessory Cat. No.:	8M MANA
Description:	8 meter galvanised steel column with lantern bracket
Dimensions:	Height : 8000mm, Dia: 150mm
Colour:	Black. RAL9005
Manufacturer:	Phillips Lighting 01293 776774
Lamp Cat. No.:	205360 15
Volts/Watts	240v 150w
Description:	Master CityWhite CDO-TT 150W/828 E40 SLV (Single ended, Ceramic Metal Halide Lamp – 2800k)
Manufacturer:	Philips 020 8665 6655

Luminaire Specification Sheets

Description:	Column	
Column Type:	Galvanised Steel Column	
Height/s:	4 6, 8 and 10 meter Columns to be abcided (3mm plastic coating applied to the column internally/externally) in black to match lantern	
Required Accessories:	Banner Arm Brackets	
Colour:	Black or to match lantern (as per lantern colour details)	
Recommended Manufacturers: (in alphabetical order)	CU Phosco	01920 860 600
	DW Windsor	01992 474600
	Phillips Lighting	01293 776774
	Urbis	01256 354446
	Sugg Lighting	01293 540 111
	WRTL	0121 521 1234

Luminaire Specification Sheets

Description:	Lantern - for High Pressure Sodium (SON) lamp
Lantern Type:	Flat Glass
Lighting Requirements:	BS5489 EN13201 If desired standards can not be achieved as a result of limited design positions then a "bowl glass" lantern can be considered. (For example; setting out locations for way-leave agreements with property owners).
Control Gear:	Electronic control gear
Control:	Integral electronic photocel.
Lantern Colour:	Black Unless it is deemed necessary to match that of the surrounding landscape furniture such as railings, feeder pillars, bollards, etc. Design team to advise when appropriate.
Recommended Manufacturers: (in alphabetical order)	CU Phosco 01920 860 600 DW Windsor 01992 474600 Phillips Lighting 01293 776774 Urbis 01256 354446 Sugg Lighting 01293 540 111 WRTL 0121 521 1234
Lamp Type:	High Pressure Sodium
Colour Rendering Index (Ra):	45-65 (or above) 45 is the minimum requirement
Lamp Life:	Currently 20,000 – 24,000 hours
Proposed Manufacturers:	Philips 020 8665 6655 Osram 01744 812221

The following specification is an example of a luminaire type that meets ALL of the design criteria set out within this document. This specification is indicative and is intended as reference only.

Description:	Highways "flat glass" Lantern with electronic control for High Pressure Sodium lamp
Luminaire Cat. No.:	Milewide SRS419/421/427
Description:	Highway lantern with integral electronic control gear and photocell
Dimensions:	Length: 488mm, Width: 234mm, Height: 167mm
Mounting:	Side entry mounting to column
Colour:	Black. RAL9005
Manufacturer:	Phillips Lighting 01293 776774
Accessory Cat. No.:	8M MANA
Description:	8 meter galvanised steel column with lantern bracket
Dimensions:	Height : 8000mm, Dia: 150mm
Colour:	Black. RAL9005
Manufacturer:	Phillips Lighting 01293 776774
Lamp Cat. No.:	NAV-T 150 SUPER 4Y
Volts/Watts:	240v 150w
Description:	Single ended, High Pressure Sodium Lamp
Manufacturer:	Osram 01744 812221

Uplight

Description: Ground recessed adjustable uplight.

Luminaire Description: IP68 rated low surface temperature stainless steel ground uplight

Mounting: Ground recessed. Radiused or flush bezels rings available

Adjustment: Full adjustment in both X and Y axis available. Once focussed the luminaire should be looked to ensure that the lighting can not be (accidentally) realigned during future lamp change or maintenance.

Ingress Protection Rating: IP65 (minimum)
IP68 (recommended) *

*This product is rated at IP68. IP68 products can be submersed in water and are therefore protected against water ingress. IP65 products are suitable for exterior use but they can NOT be submersed in water. Drainage is therefore essential for these products.

Reflector Notes: Light pollution MUST be avoided at all times. Specifying “wide beam reflectors” should only be used for large surfaces where all of the light is required. Narrow/medium beam uplights should be specified for trees and smaller objects

Top Glass: The toughened glass top is 12mm thick and has a drive over approval of up to 4000kg at 30km/h with even tread on the top plate.

Top Glass Heat: Surface temperatures of recessed luminaires can get very hot. The following luminaire type has been designed so that the heat is sent back into the fitting. So no additional accessory is required. fitting tested at 25 degree ambient

Accessories: Anti-slip texture can be added to the top plate. Anti-slip textures do effect the light distribution of the luminaires. However, they should be used if the luminaire is to be located within a heavily used pedestrian area.

Proposed Manufacturer: Louis Poulsen 020 8397 4400
(and product range) (IRP14 range or similar)

Lamp Description: Ceramic Metal Halide Lamp (single ended or double ended - depending on reflector specification).

Wattage: 70w (35w available)

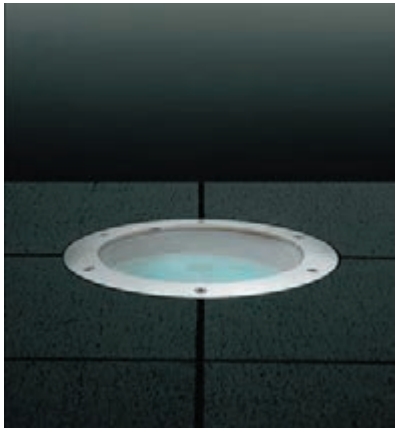
Colour tempreture (k): 3000k

Ra (Colour Rendering): 80 – 100

Lamp Life: 12,000 – 15,000 hours

Output (Luminous Flux lm): 5,700 – 6,500 or above

Proposed Manufacturers: Philips 020 8665 6655
Osram 01744 812221



08 Planting

Choice of Tree Species

The following is a list of tree species which are suitable, in the right circumstances, for planting in the public realm. It cannot be overemphasised that each situation is unique and requires individual design consideration. The species given is not an exhaustive list. Other species will be suitable in certain settings. The species choice, stock specification, spacing, layout and planting context should take the following factors into account:

- Character of tree in context
- Change through seasons
- Height and spread after 10 years
- Mature height and spread
- Height of crown above ground
- Density of shade when in leaf
- Obscuring of views / screening
- Character of foliage / size of leaf
- Colour of leaf, flower and fruit
- Leaf, flower and fruit drop
- Wildlife
- Exposure to wind
- Proximity of vehicular traffic
- Regularity of maintenance (likelihood / requirement)
- Exposure to vandalism
- Vigour, ease of establishment
- Availability at required size / stock type

Large Trees

These trees, in the right circumstances, have the ability to become true large street trees, developing to sufficient size for pedestrian and vehicular traffic to move around underneath the crown and for visibility at ground level to be largely unrestricted.

Acer platanoides ‘Emerald Queen
Norway maple

Acer campestre ‘Elsrijk’
field maple, erect variety

Carpinus betulus ‘Fans Fontaine’
hornbeam, columnnar variety

Corylus colurna
turkish hazel

Ginko biloba
maidenhair tree

Juglans nigra
black walnut

Liquidamber styracifolia
sweet gum

Pinus nigra
Austrian pine

Platanus x hispanica
London plane

Prunus avium ‘Plena’
wild cherry, double flowered

Quercus cerris
Turkey oak

Quercus ilex
evergreen oak

Quercus frainetto
Hungarian oak

Quercus rubra
red oak

Robinia pseudoacacia
acacia

Tilia cordata
small leaved lime

Tilia platyphyllos ‘Rubra’
broad leaved lime

Tilia tomentosa
silver lime

Choice Of Tree Species

Small and Medium Sized Trees

These trees are reliable for urban planting and suitable in situations such as public squares, courtyards, gardens, parks, lawns etc. where there is space for smaller trees to spread without causing obstruction to movement, visibility, light etc.

Alnus cordata
Italian alder

Betula albosinensis
Chinese red bark birch

Betula jaquemontii
Jaquemont's birch

Betula utilis
Himalayan birch

Crataegus x prunifolia
broadleaf cockspur thorn

Malus floribunda
Japanese crab (red / yellow fruit)

Malus 'John Downie'
crab (yellow / orange / red fruit)

Malus 'Evereste'
crab (orange / red fruit)

Malus 'Profusion'
crab (red fruit)

Malus trilobata
crab (white blossom)

Prunus hillierii 'Spire'
flowering cherry, erect variety

Prunus padus 'Watereri'
bird cherry, large flower variety

Prunus sargentii
Sargent cherry

Prunus serrulata 'Sunset Boulevard'
Tibetan cherry

Prunus 'Umineko'
Japanese cherry (white blossom)

Prunus 'Tai Haku'
Japanese cherry (white blossom)

Prunus 'Ukon'
Japanese cherry (cream blossom)

Pyrus 'Chanticleer'
ornamental pear

Sorbus aria 'Majestica'
whitebeam, large leaf variety

Sorbus aucuparia 'Cardinal Royal'
rowan, variety

Sorbus aucuparia 'Golden Wonder'
rowan, variety

Sorbus commixta 'Embley'
Chinese scarlet rowan

Sorbus intermedia
Sweedish whitebeam

Tree Pits

New Tree Pits

Care taken in the design and construction of tree pits will help the trees establish, will allow them to develop properly over decades and to reach their potential as healthy and safe mature specimens. Good tree pit design also makes maintenance and replacement easier.

Tree pits in the context of high quality urban public realm should be based on the following design principles:

- The pits (not necessarily the opening) must be as large as possible, generally 9m^2 on plan minimum unless unavoidably restricted. The quality of surrounding subsoil is important. A well structured, free draining and uncontaminated subsoil will allow the pit to be smaller
- The growing medium must be the 'Amsterdam tree soil' type, now supplied by many specialists
- The surrounding surfacing (probably rigid construction) should 'float' over the tree soil backfill, which should be capable of compaction sufficient to give a CBR value of 10% and therefore can support the surfacing over
- The opening in the (normally rigid) surfacing should be just large enough for the tree to be planted through, so that the tree can be planted following all construction and can be replaced without disturbing the rigid surfacing around
- Using the above principles, there is no reason why the tree / opening should be concentric with the tree pit underneath. Furthermore, the tree pit can be any shape as necessary to avoid underground restrictions and take advantage of any unrestricted areas
- The depth of tree soil must be 800mm minimum
- The base of the pit must be free draining. Land drains to soakaways to soakaways should be installed if necessary
- All trees must be planted with an irrigation / aeration pipe around the root ball, accessible via two secure lockable stainless steel caps
- The opening around the base of the tree trunk should be surfaced with graded unbound material which is self compacting and will not restrict trunk growth. Pea gravel or similar is not suitable because it becomes dislodged. Resin bound aggregates are unnecessarily expensive and will restrict trunk growth. Tree grilles are not recommended because they often become unseated over time and also trap litter
- The trees must be secured using an underground guying system (typically a 'deadman' or proprietary anchor system) with tensioned canvas straps
- Tree guards are not recommended. They become a target in themselves and trap litter
- The trees should be planted as large size stock (specified size depends on species) so as to be resistant to vandalism. They must have the crown raised with all branches below 2.4m removed
- Some underground services, depending on the type and location, can pass through or be adjacent to tree pits if protected by a proprietary root barrier

Existing Tree Roots and Surfacing Damage

Some of the existing trees in the town centre have developed roots at a high level which have begun to lift adjacent surfacing. The remedy to this will vary with the circumstances of each case and expert advice should be sought on each occasion. Solutions might include the following:

- Judicious root pruning, taking care not to remove anchorage
- Changing of surrounding surfacing to an unbound informal material
- Enlarging or changing the shape of the surrounding unbound area
- Felling and replanting with a more suitable species

Tree Pit Detail

Opening in rigid surfacing to allow for planting and replacement of semi mature root balled stock

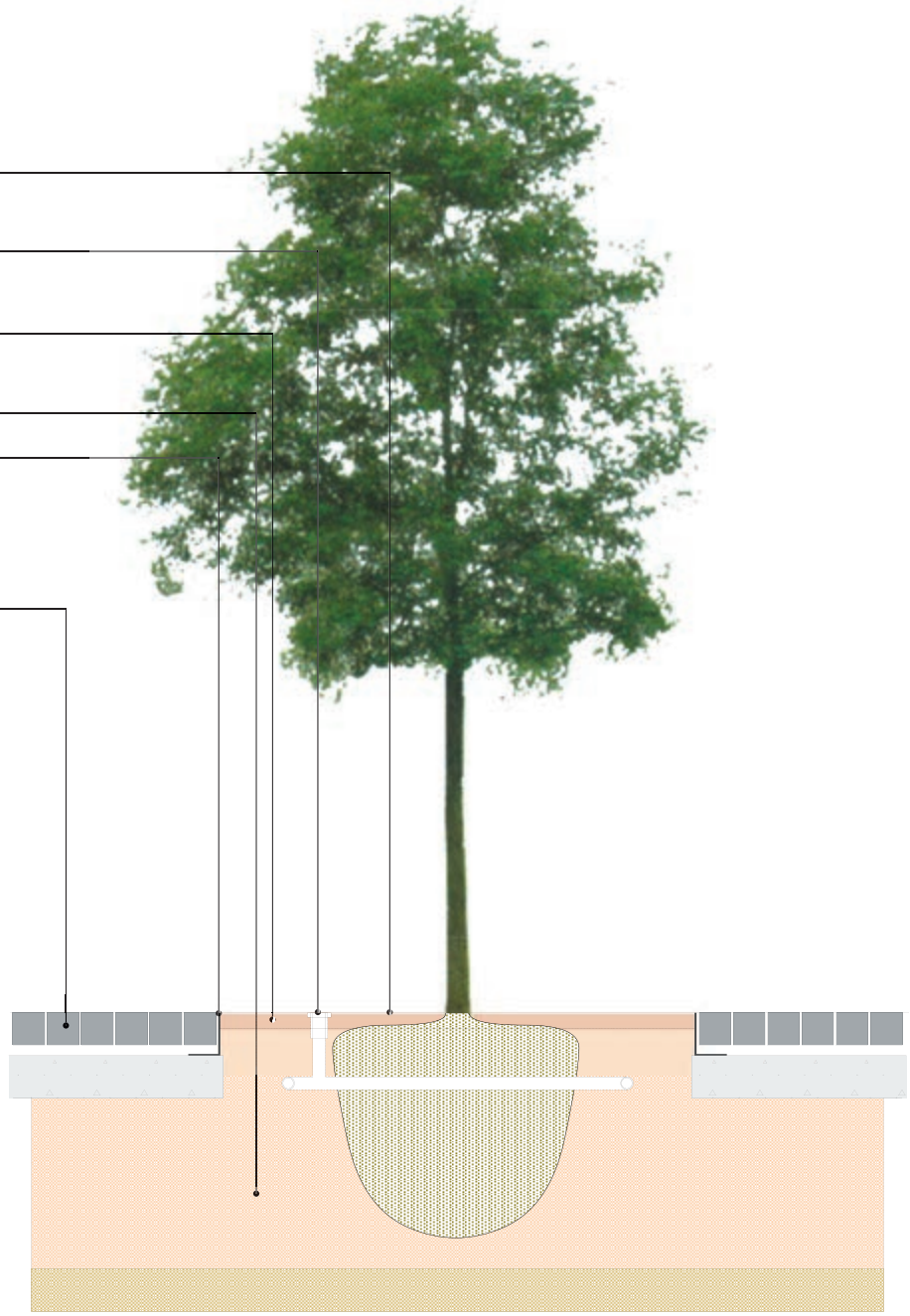
Proprietary irrigation / aeration system with two access points and lockable stainless steel caps

75mm depth of self compacting hoggin, Bredon gravel or similar

800mm depth of tree sand below surfacing base

Tree surround frame fabricated as single piece from 200 x 200 x 8 thickness grade 316 stainless steel angle or similar, top edge flush with surrounding setts

Surrounding rigid surfacing, including concrete slab (nom. 400mm depth)



- Tree sand growing medium to be compacted to achieve min. CBR value of 10%
- Pit to be free draining with perforated pipe active drainage to soakaway if necessary
- Pit does not need to be concentric with tree
- Semi mature root balled tree

Other Planting

Grass Areas

The inclusion and design of grassed areas in the town centre should be guided by the following principles:

- Grass areas should only be included where they are large enough to provide a benefit and be viable in the long term
- Good soil / subsoil structure and drainage are essential to ease maintenance and extend benefit to the public
- Overall design of the space should take account of pedestrian movement so that parts of the grass do not become unacceptably worn by trafficking
- Attention must be paid to edge detailing. For example, an upstand edge, even if slight, will require a strimming operation in addition to a mowing operation
- The design should seek to minimise the number of obstructions to mowing (eg. columns of any sort, trees, small planting beds, complex edging shapes)
- Suitable access must be provided for all users and for maintenance equipment
- Grass areas will be seldom used if not in a sunny location

Shrubs, Hedges and Perennials

Planting other than trees should be used very sparingly and only in appropriate situations. Shrubs, hedges and perennial planting can be successful in park or public garden situations and occasionally in a public square. Each situation should be designed on its merits. There are so many variable factors with the detailed design that only two items of general design guidance are recommended here:

- Firstly, this type of planting should only be considered when there is a compelling reason to do so. The problems will normally outweigh the benefits
- Secondly, ensure that there is appropriately funded and expert maintenance in place before proceeding

The kind of problems which such planting generates includes trapping litter, harbouring pests, trampling by pedestrians, obstructing movement and generally restricting options for management and use of public space. Most of these reemphasise the need for suitably intense maintenance.

Annual Displays

Displays of annual plants are popular and brighten the public realm during the season. Displays are currently maintained only in the Civic Core area (Victoria Square, Le Mans Crescent, Newport Street). The areas of display can be extended as the areas of high quality public realm are rolled out but there are, of course, maintenance implications. The plants must be watered up to three times / week, weeded, dead headed and periodically replaced. The extent of these displays will simply reflect the budgets which are set.

Annual planting should be displayed in hanging baskets. These are secured with brackets to lighting columns or similar. The baskets / brackets are not part of a proprietary system an can be fixed to any type of column. They should be set at 3m to 4m height to avoid creating obstructions and being vulnerable to vandalism. Displays in hanging baskets are essentially transient. This has the advantage that possible future reductions in funding will not lead to poorly maintained plants; there will simply be a reduction in numbers of baskets.

It is recommended that ground level constructed planters (eg. existing ‘coffin beds’ in Deansgate) are avoided because they impede movement and create undue maintenance problems. Similarly, low level containers should be avoided.

Ensuring A Green Legacy

The next phase of public realm investment should leave a legacy of green spaces and large scale structured tree planting in the town centre for future generations. This can be achieved by concentrating on two aspects of the regeneration process; firstly, by the creation of more opportunities for planting and secondly, by an insistence on quality at the point of implementation.

Opportunities for planting will be increased by:

- Briefs for public funded environmental enhancement schemes should set out an appropriate level of planting for that situation
- Briefs for highway design led improvements should set out an appropriate degree of priority which should be given to planting. This priority should be carried through the design and implementation by the continued involvement of appropriate officers in the client group
- Development briefs should clearly set out at an early stage the required level and quality of planting which the developer will be required to deliver. Considered and detailed basic requirements are better than general comments, pending further design development
- Where a there is a development brief for a scheme where planting is inappropriate, the developer could be required to invest in planting elsewhere in the town centre under a Section 106 Agreement
- All planting of trees in streets has the potential to be severely constrained by the presence of underground services. The Public Realm Strategy proposes several formal avenues and boulevards. Existing service locations is a feasibility issue with these. The design process must start with a detailed site investigation and appraisal. Service relocations might be necessary. The presence of services must be accurately determined at the start rather than used as a reason for failure in the end

Once opportunities have been created, it is important that quality is delivered on the ground. The following approaches should enable Bolton Council to ensure a level of greenery which will develop over time to transform the town centre:

- Ensure that developers and public realm designers are aware of the PRIF and do adhere to the recommendations
- The development control process must use the PRIF as a basic tool to lift the quality of planting proposals in planning applications for town centre sites
- Detailed ‘landscape’ proposals should be required in planning applications rather than being required under reserve matters or being the subject of conditions
- The enforcement aspect of the development control process should use the arboricultural / landscape design expertise of Bolton Council Officers to verify if completed schemes comply with planning permissions
- Planning conditions could require the involvement / approval of appropriate Bolton Council Officers at key stages of contract preparation, construction, stock approval etc
- With public funded environmental improvement schemes, the Bolton Council led client group should make good use of the arboricultural / landscape design expertise within the Council, in order to promote the long term interests of the town centre

09 Maintenance, Repair and Reinstatement

Maintenance

Requirement for Maintenance

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

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

Design for Maintenance

This report recommends that capital investment should be relatively high in order to gain maximum benefit from that investment and to achieve good value in the long term. This is set out in detail in the Lifetime Cost Comparative Study in Appendix A of the Public Realm Implementation Plan. One of the benefits of high quality public realm is a reduced requirement for repair. One of the challenges of high quality public realm is the care and attention which must be paid to any repair works and, particularly, to reinstatement following works by statutory service providers, as covered below.

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

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

Service Providers

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

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

Procedures and dealings with service provider companies are governed by statutory legislation, The Roads and Streetworks Act 1991. Whilst Bolton Council have the appropriate regular coordination with the service providers, this report highlights seven approaches which are recommended in order to safeguard the future of quality public realm from the activities of service providers:

1. The service providers should be brought into the process at an early stage and at a strategic level. They should be advised of the overall plans and the surfacing details, so far as these are understood at the time. This will give them good notice to plan infrastructure work and sort out any of their existing plant which has sub standard or is otherwise defective. The experience of the current team is that they will not always take this opportunity but nevertheless they should be encouraged. The Highway Authority should continue to promote the active involvement of service providers and avoid a confrontational approach.
2. The management of the public realm must adopt a rigorous approach to policing reinstatement following excavations to access or install underground services. This should include inspections before and during reinstatement works and during / after the adoption period. The service providers are obliged to reinstate the surfacing to the previously existing quality. The Highway Authority should continue to assert its rights in legislation to ensure that the service providers do reinstate properly. Common experience indicates that they will not do this unless sufficient pressure is applied in each and every case. Failure to do that will result in a severe deterioration in the quality of the surfacing over time.
3. The Highway Authority should maintain a panel of contractors who have a proven capability to reinstate high quality public realm. This list should be shared with the service providers with a recommendation that these contractors should be used for reinstatement work. In extreme cases, the Highway Authority could commission the reinstatement work and countercharge the service providers.

Service Providers

4. The Highway Authority should issue to service providers a full set on construction information as necessary for reinstatement of surfacing. Particular attention should be paid compaction of backfill, the structural integrity of the slab / bed / jointing and the matching of the surfacing finish. These requirements should be discussed at a strategic level to encourage forward planning.
5. The natural stone surfacing materials will probably be subject to relatively long delivery periods and repairs will need to be in matching colours, sizes etc. Therefore it is recommended that each scheme provides a range of additional quantities of material to be stored for future maintenance following excavations by service providers etc. The details of this should be agreed with the Highway Authority as part of the design approval process. It is essential that the range of surfacing materials and construction techniques in the whole town centre is limited to a reasonably restricted palette so that the storage of reinstatement materials is manageable.
6. The relocation of existing services encountered is often a key delivery issue for public realm or developer public realm projects. It is advised that appropriate searches and actual physical site investigations are carried out in good time for services relocations to be costed, agreed, funded and carried out without causing delay and unbudgeted cost.
7. On completion of a highway project covered by the Public Realm Implementation Framework, the project should be entered onto the Streetworks Register as a Special Engineering Difficulty. In doing this a requirement will be placed on all streetworks promoters to take account of the requirements set out within SWR which can include the necessity to contact nominated council officials prior to work commencing.

Appendix A

Appendix A

The following contextual material and design guidance was consulted in the preparation of this report.

Building Bolton
Supplementaty Planning Guidance
Bolton Council 2006

Bolton Town Centre Action Framework
Bolton Council 2005

Coming To Bolton: A Town Centre Transport Plan
Bolton Council 2006

Roads for Adoption – A guide for developer: Issue 2
Bolton Council 2003

Better Buses: Good Practice in Greater Manchester
The Association of Greater Manchester Authorities,
GMADE, GMPTE, The Bus and Coach Council

Highway Long Term Proposals: North East Sector,
Proposed Gyratory
Bolton Council 2006

Pedestrian Access & Mobility – A Code of Practice
Bolton Council 2005

Churchgate Public Realm Works: Typical Cross Section
Bolton Council 2006