Public Realm Material Specification

Sligo County Council

Prepared on behalf of SCC in January 2019

SLIGO
COUNTY COUNCIL
COMHAIRLE CHONTAE SHLIGIGH

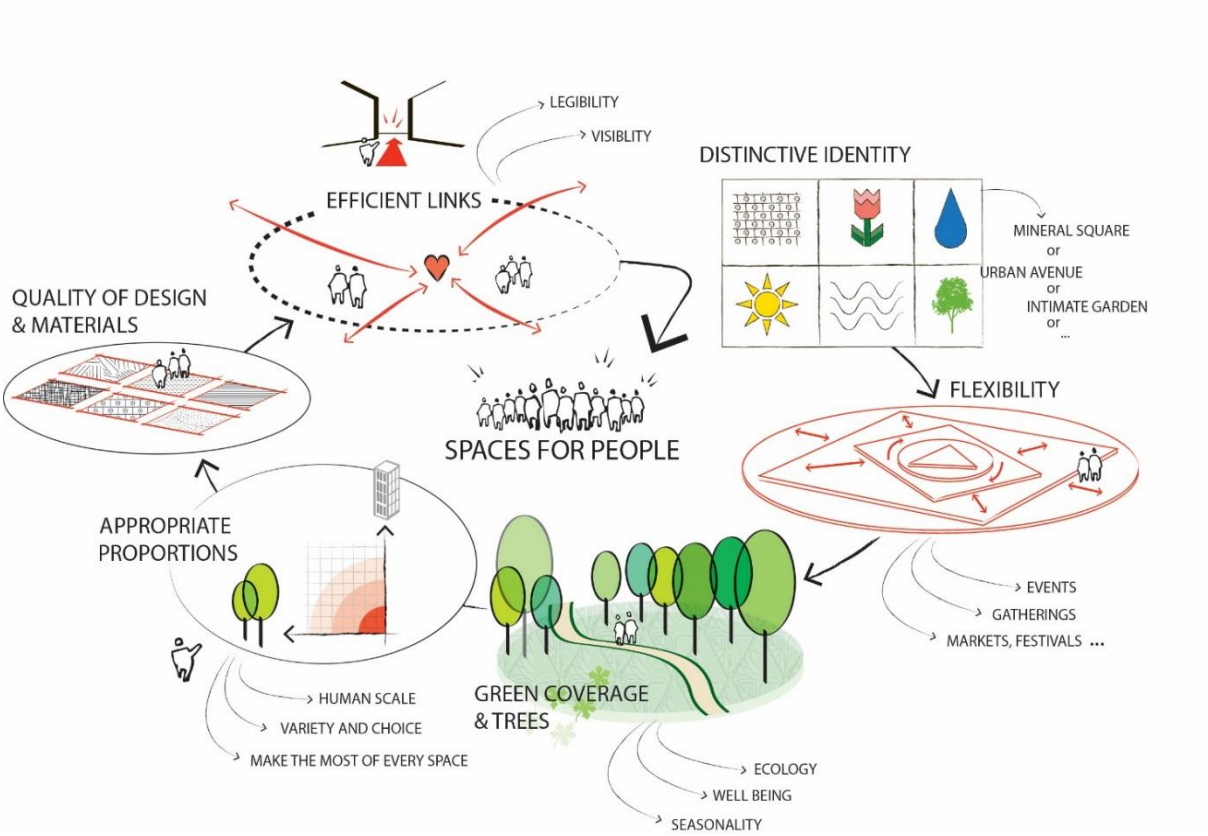
The purpose of the specification

In 2018 Sligo County Council appointed BDP to prepare a Public Realm Action Plan for the city centre. This document included an overall vision for the streets and spaces and then described the approach to each area through a design manual and specific projects. A list of emerging actions was also included, one of which being the production of a Council approved specification for the use and application of materials within the public realm, relative to the different zones within the city.

This document is intended to be used by the County Council, designers, developers and any third parties who have an interface with the public realm. The document intends to offer guidance and prescribe the benchmark in quality and aesthetic.

The public realm should be designed and constructed using surfacing materials as set out in this document. The aim is to use a palette that will provide a coordinated paving strategy that will ultimately improve the quality of the streets and spaces of Sligo and encourage more walking and cycling in the city centre.

To encourage consistency of design and workmanship, this specification includes colour, stone dimensions and laying techniques. Materials have been selected and detailed to comply with County Council maintenance requirements.



Overall approach to paving in the city

Please refer to the 2018 Public Realm Action Plan which demonstrates the objectives behind the decisions made regarding materials, their use and installation.

Extracts relevant to this specification:

All paving should be of high quality and suitable to withstand the function of the area. Durability, lifespan and visual appreciation should all be considered when specifications are being determined.

The choice of natural stone is made for the following reasons:

- Appropriate to the heritage of the area.
- Durability - when laid on a concrete base, it will achieve a long lifespan with minimal maintenance.
- Stone products improve in appearance with natural weathering.
- Depending on colour and source, the material cost difference compared to concrete products is minimal.

General principles for all areas:

The street layout and use of materials and furniture should always be design-led and follow the principle of DMURS, avoiding unnecessary clutter, complicated layouts and overdesign. Street furniture should be rationalised and coordinated so as not to impede pedestrian movement.

The vehicular carriageway width should be minimised (between 6m and 6.4m for a two-way street) to reduce vehicular speeds and allow integration of cycling without designated lanes within the town centre. The surfacing should be a high quality asphalt laid between granite kerbs which should clearly define the carriageway. The carriageway should be a contrasting colour to footpaths where there are considerable vehicle flows, to assist the visually impaired.

Kerbs are to be a maximum of 100mm high throughout, lowering to a minimum of 50mm where a shared environment is more appropriate and corresponds to the function of the street. It is essential to use radius sections, quadrants and dropper kerbs within the design. All exposed edges are to have a 20mm bullnose.

Small unit slabs/setts should be used as appropriate to allow ease of laying and achieve levels tying in to both thresholds and crossing points, without the need for triangular cuts which should be avoided.

All paving falls are to be compliant with Building Regulations and universal design standards, typically between 1:40 and 1:80.

Drainage units, manhole covers and other components in the paving should be flush with surrounding areas. They should be integrated within the design to avoid trip hazards. Paving infill covers are not required. However there should be a maximum 10mm gap between the frame and the outer paving.

Access (degree of control) needs to be integrated into the design.

Specifying materials

The plan below shows the approach for the city's streets and spaces

Core city streets (dark purple)

The pedestrian areas of the inner city centre streets should be natural stone, granite or similar, laid on a rigid concrete base with mortar bedding and joints. Small unit slabs are suggested for ease of use, weight and cost for such areas, nominally 60mm thick. Where natural stone is being used in vehicle areas, thicker setts should be used. Kerbs should be granite throughout, defining asphalt carriageways where there is through traffic. Pedestrian crossings should be raised to footpath level and paved with granite setts.

Radiating streets (light purple)

In adjoining streets, a modular concrete sett is to be used for the pedestrian areas. This has already been used in a number of areas in Sligo. Kerbs should be granite throughout, defining asphalt carriageways. Pedestrian crossings should be dropped to carriageway level.

Key defined spaces (orange)

There are a number of defined spaces that are unique given their setting and purpose and therefore offer the opportunity to create contrast and add variety and identity. The choice of materials in these spaces should be design-led, originate from the setting of the space and be complementary to the adjacent surroundings. Natural stone paving is recommended using small unit slab paving/setts relative to proposed use and overrun. There may be other smaller spaces that present themselves as suitable for this category such as private forecourts or spaces within new developments.

Typical details

A number of typical details are included on the following pages which have been approved by Sligo County Council. In each case a rationale for their use is included. Also included is a list of current supplies of certain materials to assist the user of this document. The designer should undertake their own assessments when specifying suppliers.

General principles which apply to all details:

Granite choice

- The default colour for granite is silver grey, which is the most cost-effective and has physical properties that are generally preferable.
- Potential to mix complementary colours to allow ease of replacement in future years, e.g. including a percentage of mid grey, pink or oatmeal, which will also add interest and warmth.
- Potential to pick finishes to add subtle variations, e.g. a percentage of both flamed and bush hammered as a random mix.
- Consideration of random length units which reduces material cost, waste and discrepancies when laying (there is no bond - it is random, allowing an easier process for the installer).

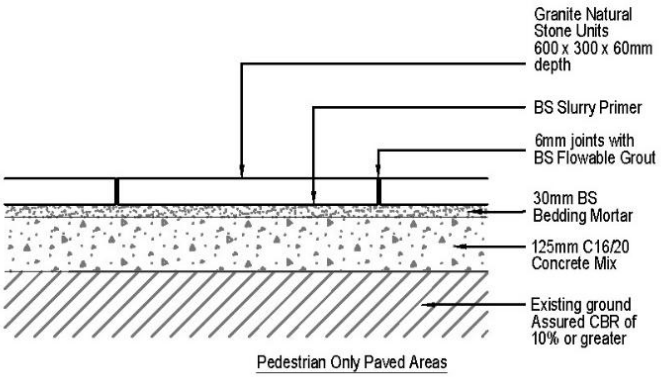
Minimum requirements for physical characteristics of granite paving:

- Min properties to BS7533-12 Table C.1. Class 1 Igneous Rock
    - Plan dimension deviation class: P2
    - Diagonal deviation class: D2
    - Thickness deviation class: T1
    - Freeze/thaw resistance class: F1
    - Flexural strength (MPa): min 12MPa
    - Compressive strength in natural condition: min 125Mpa
    - Density 2500kg/m3
    - Abrasion resistance (mm): 18mm
    - Slip/ kid resistance (USRV): Recommended slip/skid resistance
    - Pendulum value dry: 65, wet: 45
    - When tested in accordance with BS 7932:2003
    - Water absorption (% by mass): max 0.40%.

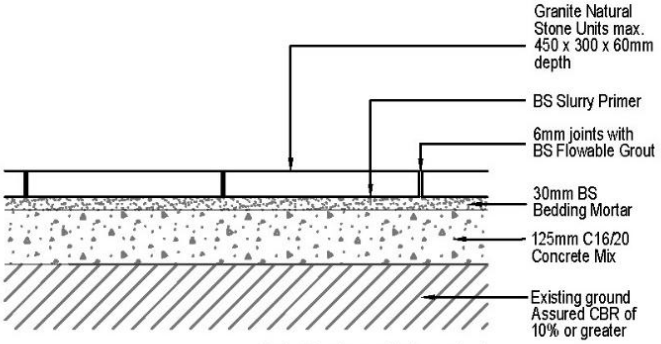
Sub-base design

It is the responsibility of the engineer to assess the underlying ground conditions and verify that existing sub-base materials achieve the requisite CBR values, as identified in the BS7533 series. If existing CBR values are insufficient then additional sub-base makeup is required, as noted on each table. Existing sub-base materials are to be assessed on site. Min sub-base thickness is shown on the following details.

Paving build-up – core area – slabs



Pedestrian Only Paved Areas



Pedestrian Areas with Occassional Vehicular Overrun

It is the responsibility of the engineer to assess the underlying ground conditions and to verify that existing sub base materials achieved the requisite CBR values as identified in the BS7533 series. If existing CBR values are insufficient then additional sub base makeup is required as noted on each table.

Existing sub base materials to be assessed on site. Min sub base thickness as follows:

CBR %	Sub base depth (mm)
2	400
2.5	350
3	350
4	350
5	220
8	190
10	175
15	150
>15	150

- Slurry primer to be in accordance with BS7533-4 and applied to both concrete base and paving base in accordance with clause 5.4.4
- Laying course material to be in accordance with BS7533-4 and laid to a depth of 30mm in accordance with clause 5.4.4.2
- Jointing material to be in accordance with BS7533-4 and placed, set, cured and cleaned in accordance with clause 5.4.4.4
- Concrete base to be 125mm thick ST4 concrete with a S3 slump classification.

Block paving should always be laid 90 degrees from the dominant kerb edge.

Minimum requirements for physical characteristics of granite paving:

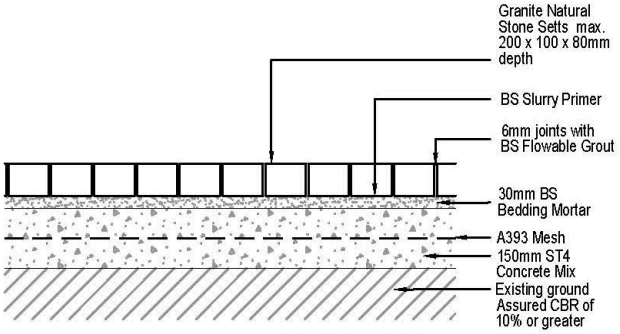
Min properties to BS7533-12 Table C.1. Class 1 Igneous Rock

- Plan dimension deviation class: P2.
- Diagonal deviation class: D2.
- Thickness deviation class: T1.
- Freeze/ thaw resistance class: F1.
- Flexural strength (MPa): min 12MPa.
- Compressive strength in natural condition: min 125Mpa
- Density 2500kg/m3
- Abrasion resistance (mm): 18mm.
- Slip/ Skid resistance (USRV): Recommended slip/skid resistance, Pendulum value dry: 65, wet: 45.
- When tested in accordance with BS 7932:2003.
- Water absorption (% by mass): max 0.40%.

Rationale

- Natural stone finish appropriate to the city centre and in line with current projects.
- Rigid concrete base to ensure it can withstand vehicular overrun and a composite strength that minimises the thickness of the granite.
- An appropriate granite unit size relative to vehicular overrun.
- Propriety BS-compliant products to de-risk the installation process and reduce failure and future maintenance.

Paving build-up – core area – setts

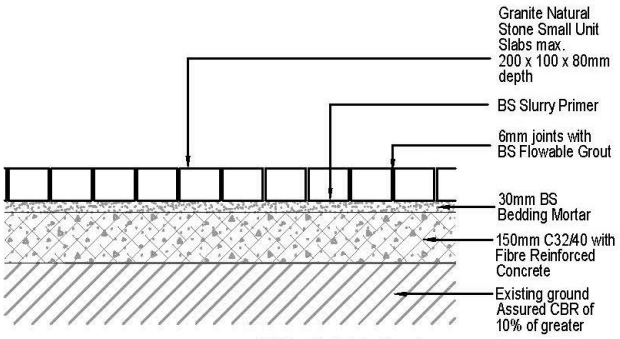


Parking / Loading Bays

- Slurry primer to be in accordance with BS7533-4 and applied to both concrete base and paving base in accordance with clause 5.4.4
- Laying course material to be a Type B mortar of min 35N/mm2 strength in accordance with BS7533-7 Cl 2.1 and should be 30mm thick with a 150mm slump as per BS7533-4 Cl 5.4.4.2
- Joints should be 10-15mm wide in accordance with BS7533-10 Table 2 and jointing material to be 40N/mm2 strength in accordance with BS7533-7 C2.2 placed, set, cured and cleaned in accordance with clause 5.4.4.4
- Concrete base to be 150mm thick ST4 or C32/40 PQC concrete with a S3 slump classification with 1 no layer A393 mesh at mid depth.

CBR %	Sub base depth (mm)
2	450
3	350
4	250
5	150
6	150

Existing sub base materials to be assessed on site. Min sub base thickness as follows:



Tabletop Pedestrian Crossings within the Carriageway

- Slurry primer to be in accordance with BS7533-4 and applied to both concrete base and paving base in accordance with clause 5.4.4
- Laying course material to be a Type B mortar of min 35N/mm2 strength in accordance with BS7533-7 Cl 2.1 and should be 30mm thick with a 150mm slump as per BS7533-4 Cl 5.4.4.2
- Joints should be 10-15mm wide in accordance with BS7533-10 Table 2 and jointing material to be 40N/mm2 strength in accordance with BS7533-7 C2.2 placed, set, cured and cleaned in accordance with clause 5.4.4.4
- Concrete base to be 150mm thick C32/40 PQC concrete with a S3 slump classification fibre reinforced.

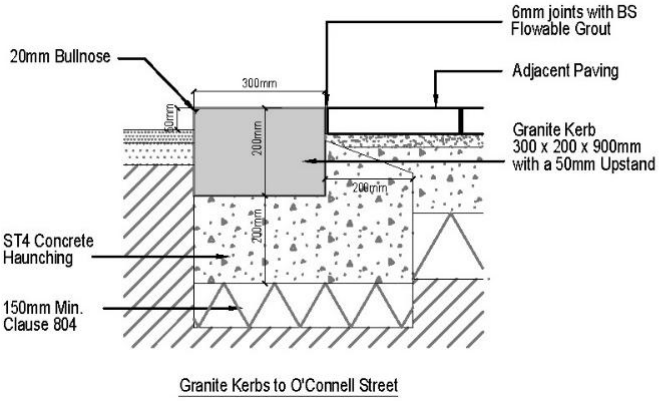
Existing sub base materials to be assessed on site. Min sub base thickness as follows:

CBR %	Sub base depth (mm)
2	450
3	350
4	250
5	150
6	150

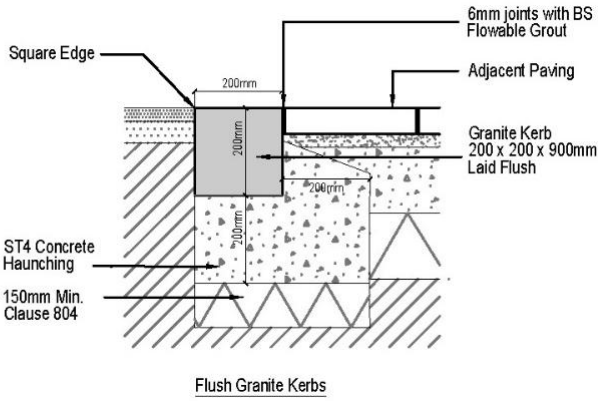
Rationale

- Natural stone finish appropriate to the city centre and in line with current projects.
- Rigid concrete base with reinforcement to parking/loading bays to withstand function.
- Structural concrete base with reinforcement for pedestrian crossings as these are high stress areas.
- Smaller unit sizes and deeper setts to provide more strength given the vehicular overrun.
- The use of setts will help differentiate these areas, which have constant vehicular use from pedestrian focused areas.
- Propriety BS-compliant products to de-risk the installation process and reduce failure and future maintenance.

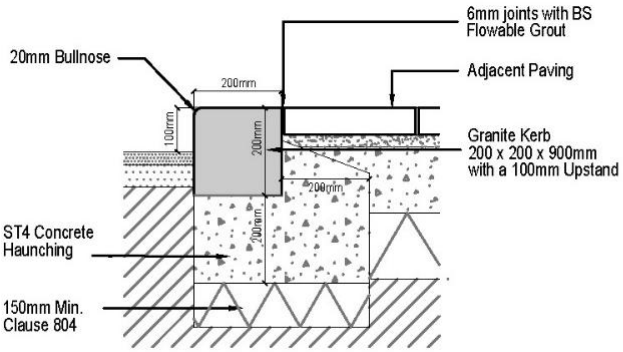
Core areas – kerbs



Granite Kerbs to O'Connell Street



Flush Granite Kerbs



Granite Kerbs to Core Areas

Note:

100mm upstands to be used as standard

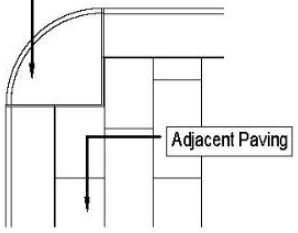
50mm upstands to be used in key areas, such as O'Connell Street

Flush kerbs to be used at crossings where necessary

Rationale

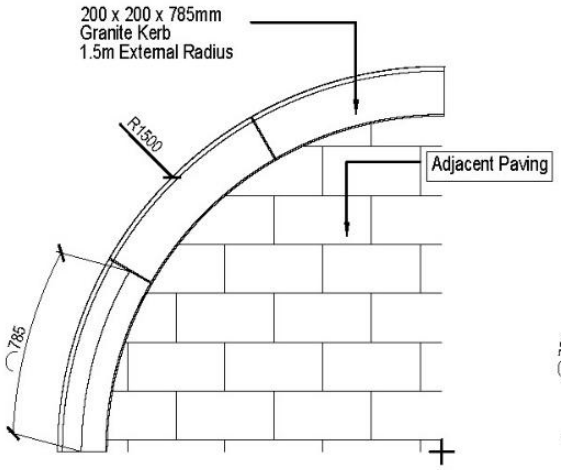
- The use of granite as a quality product and continuity for the edging, to clearly define the carriageway edge.
- The use of the same kerb component for the majority of the streets at different heights (0-100mm) to respond to the environment and degree of sharing.
- The use of a wider kerb in O'Connell Street.
- The use of a 20mm bullnose to soften the edges and reduce any damage to the kerbs and vehicle tyres on impact.

Core area – kerb specials



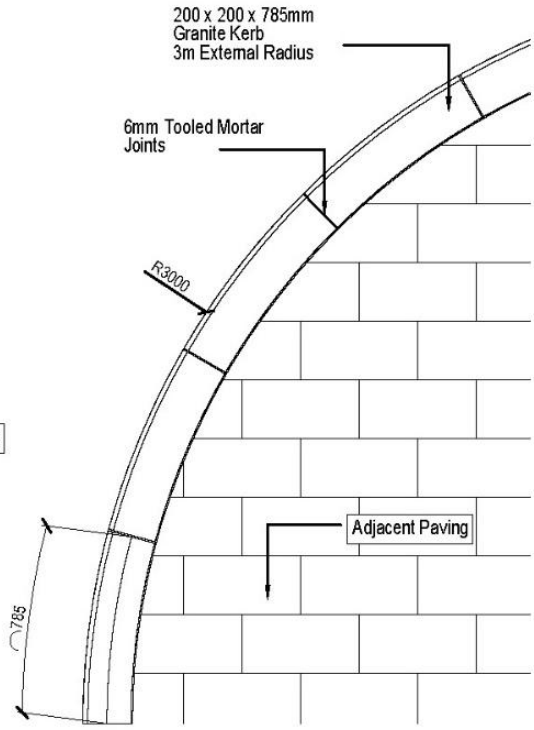
Granite Quadrant

Note: To be used for all right angle changes in direction of the kerbline.



Granite Kerb with 1.5m Curved Radius

Note: Curved radius kerbs to be used for all radii of 15m or less.

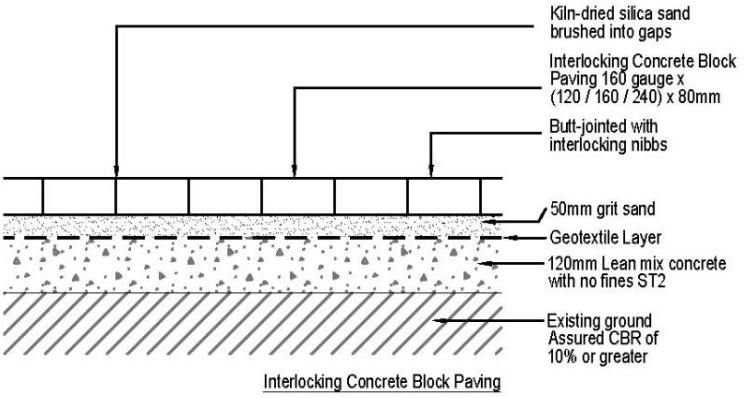


Granite Kerb with 3m Curved Radius

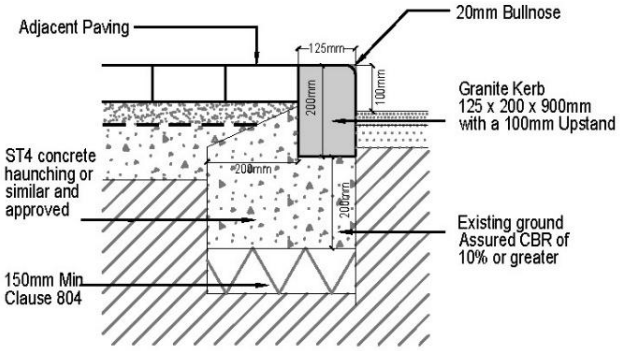
Rationale

- Given the sizes and material of the granite kerbs, these products will be manufactured to order, allowing radius, quadrant and transition kerbs to be designed and specified as part of the overall order.
- The inclusion of these specials is considered vitally important to achieve the desired quality standards within the city centre

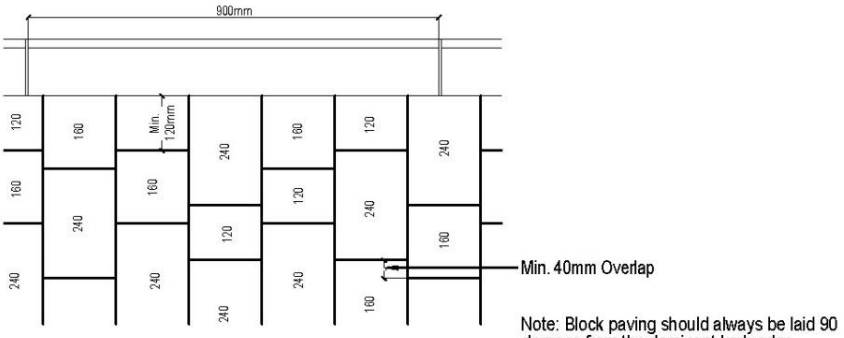
Radiating streets – paving and kerbs



Interlocking Concrete Block Paving



125mm Granite Kerb to Interlocking Concrete Blocks

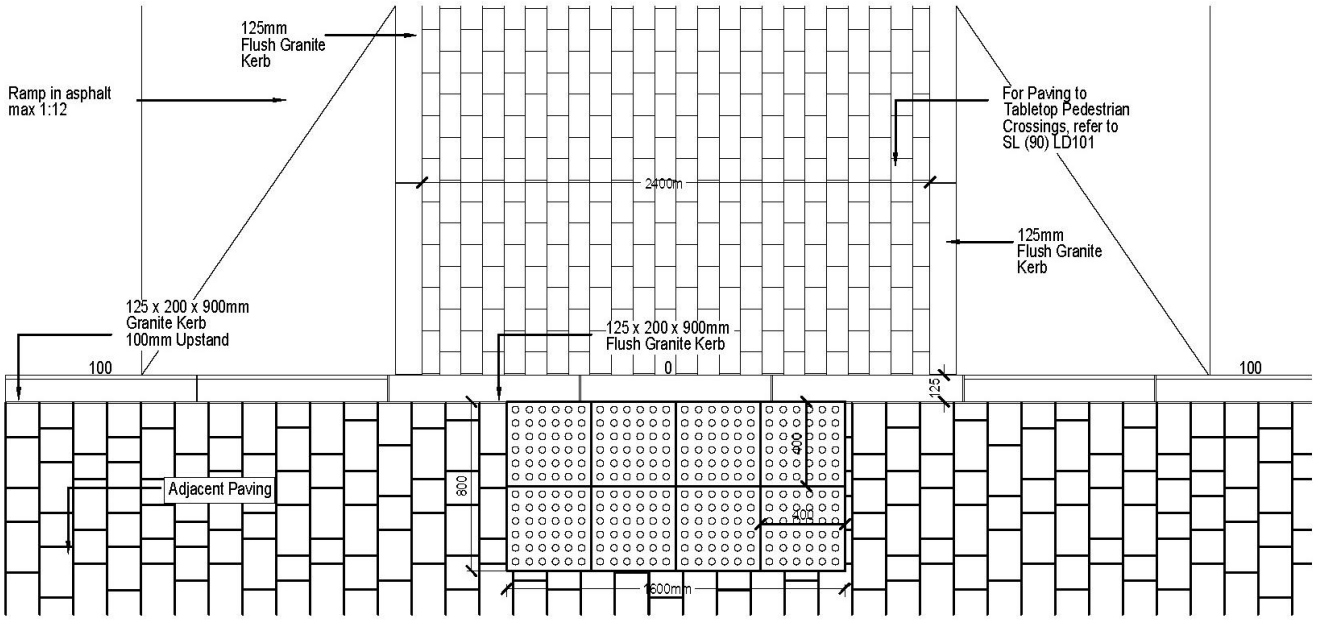


Interlocking Concrete Block Paving - Indicative Layout

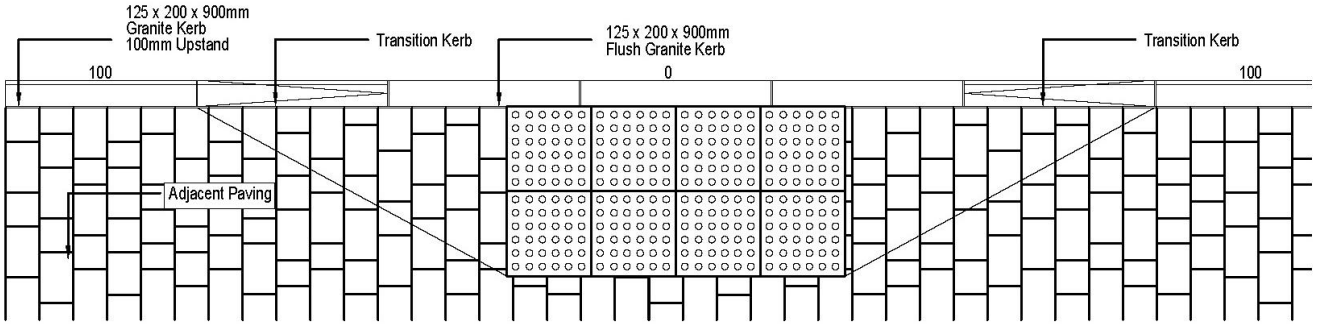
Rationale

- A more economical approach to radiating and adjoining streets.
- Flexible laid paving with a concrete base to help rigidity and minimise movement.
- A permeable construction, including the concrete, to reduce the effect of movement and the build-up of water.
- Paving specification builds upon the existing usage of concrete modular setts in Sligo.

Pedestrian crossings



Flush Crossing Details for Crossings within the Core Area

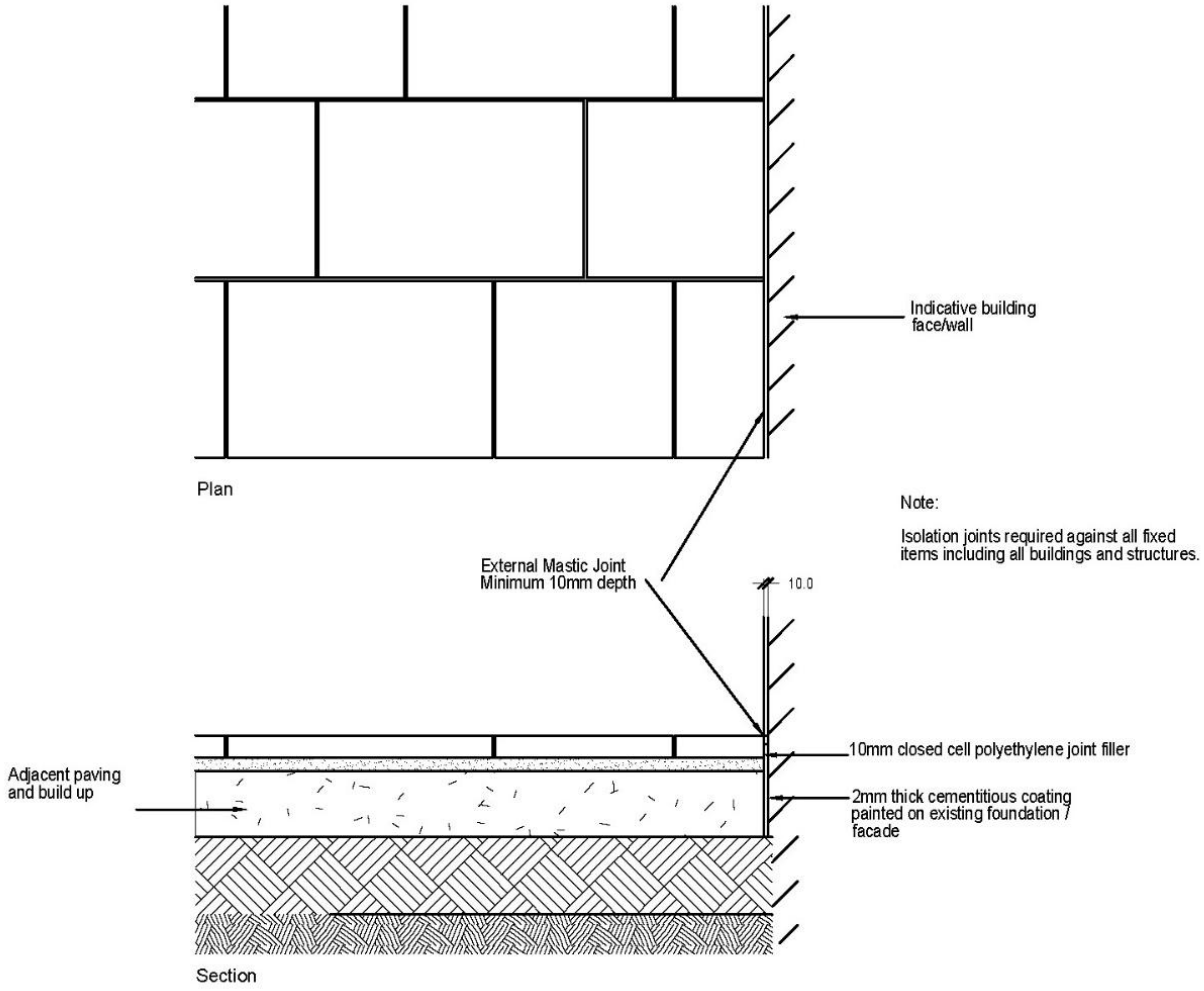


Granite Transition Kerbs

Rationale

- A strategy that changes between the core area and the radiating streets.
- Core areas have a pedestrian emphasis and focus with the raised crossings.
- Radiating streets still accommodate crossings, with an even balance between vehicles and pedestrians.
- A consistency to the approach and design of crossings that is clear and well defined for all users.
- Ramps of crossings in the core area are to be asphalt as these are high impact – the granite setts are only on the pedestrian walking zone.

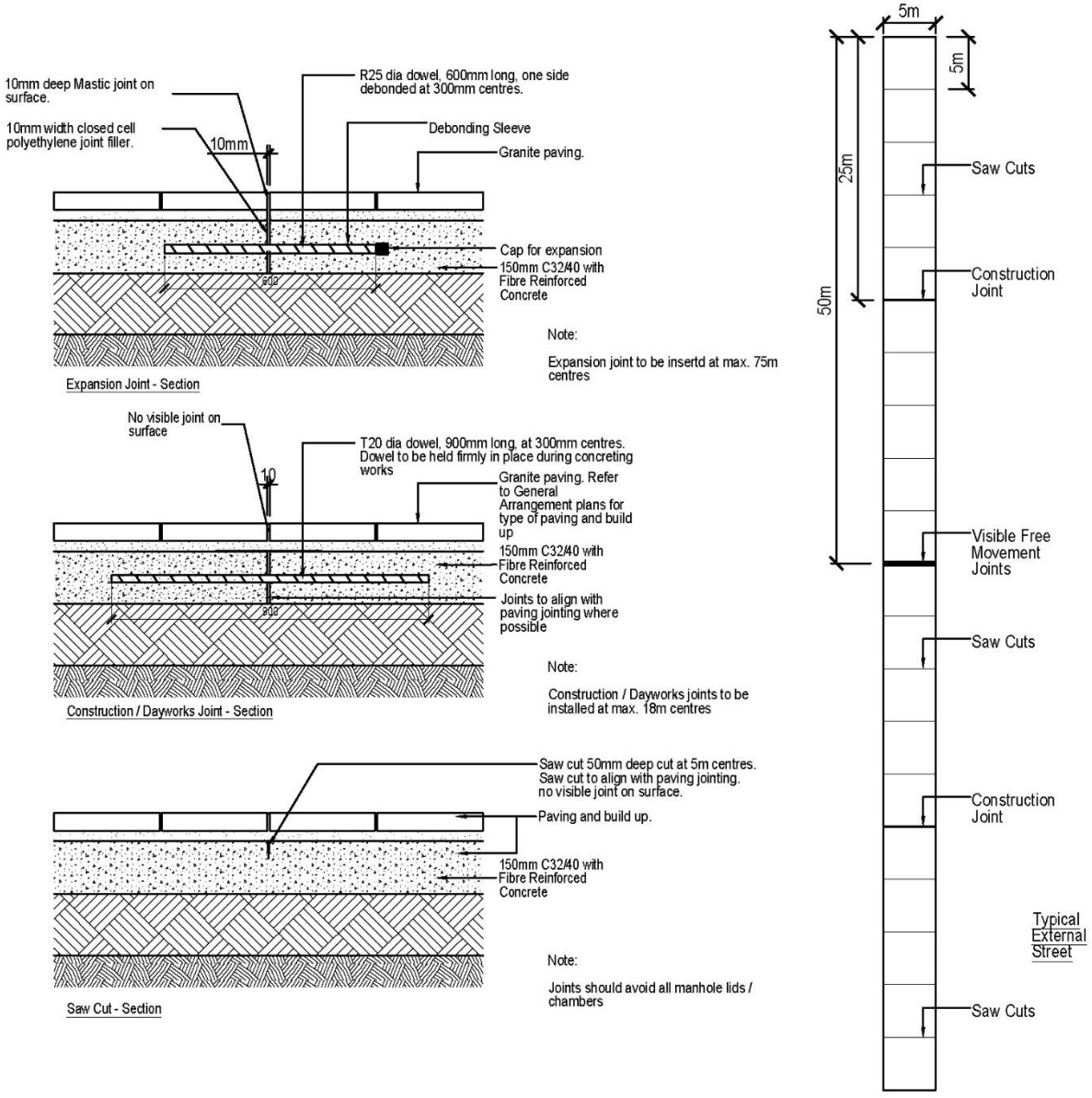
Concrete base – isolation joints



Rationale

- To allow movement against all fixed items, to minimise the potential of the paved surfaces damaging adjacent property. This is deemed necessary where paving is laid rigidly with mortar joints and a concrete base.

Concrete base – construction joints



Rationale

- Only needed where structural concrete is proposed (C32/40). This therefore does not include general pedestrian granite paving.
- Expansion joints, construction joints and saw cuts are introduced to assist with movement and flexibility in the pavement construction and ultimately to minimise any defects or cracking on the surface.
- Generally a joint is required every 25m2.

Ensuring quality

Public realm works within urban areas are complex and therefore require careful planning and programming. The detailed design, materials, elements, general arrangement, implementation of schemes and ongoing maintenance helps make good public realm that is attractive, durable and comfortable.

When considering new paving, street furniture, lighting, signage, trees and drainage etc, there needs to be a great deal of coordination. Further studies should dictate the ideal size of the working site and the most efficient working site arrangement. This in turn will highlight the sums of money necessary to complete a phased project.

The key considerations required to achieve this are noted below:

- Quality materials, workmanship and detailing, coupled with a stringent maintenance and management regime, help to build and improve the community's sense of ownership, civic pride and respect for their public realm.
- Good workmanship in the fine detail of schemes can make all the difference to the finished product.
- Suitable surveys should be commissioned prior to beginning detailed design to ensure the proposed scheme is feasible, as it is easier and more cost-effective to change things on paper than on a construction site where solutions may be limited by already constructed work.
- Coordination with utility companies should be begun as soon as possible, to identify if there are any clashes and to ensure any enabling or diversionary works are carried out when most suitable to the works programme.

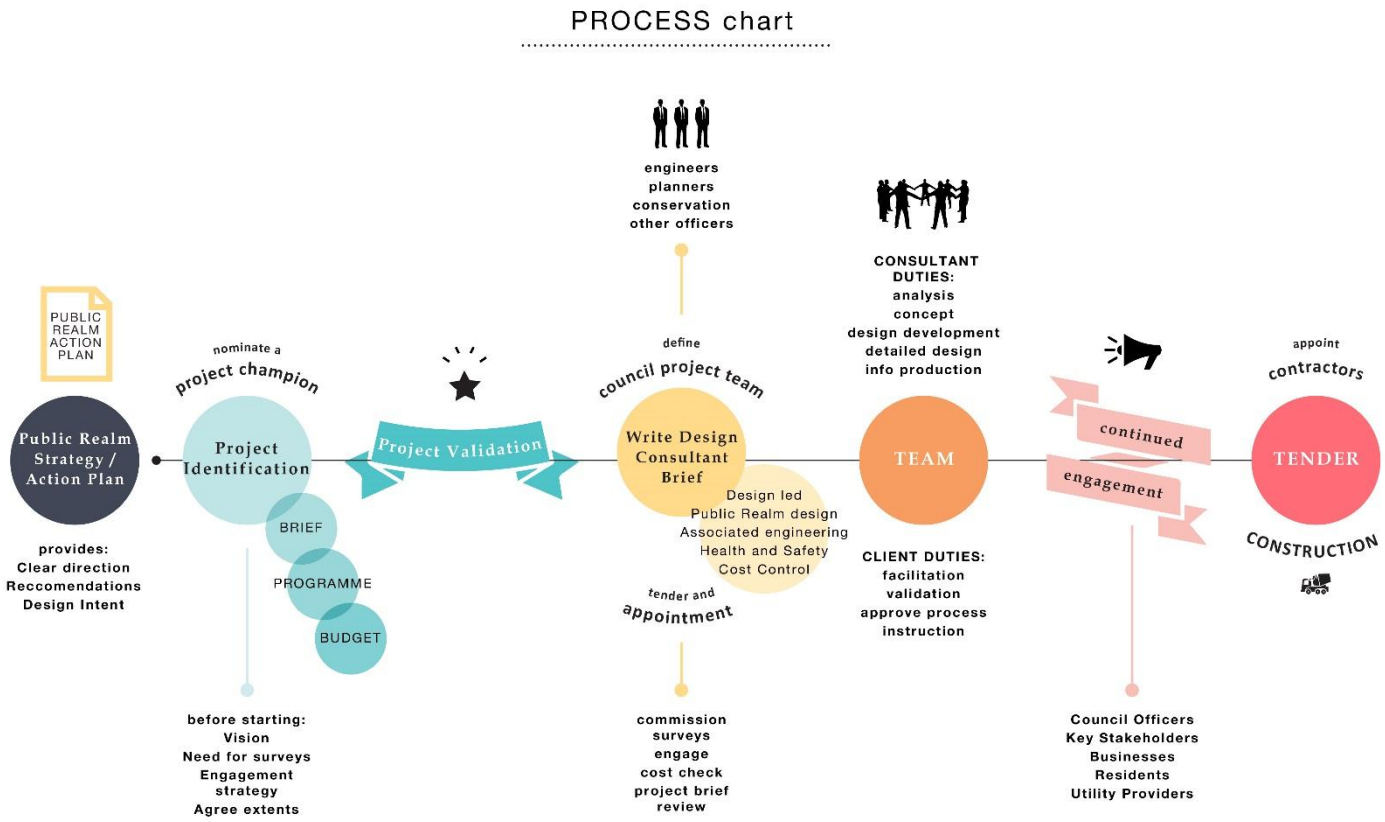
When implementing any section of the public realm the following public relations and operation of the public streets must be considered:

- Disruption to shops and businesses along the street – the extent of area 'closed off' from public use. A maximum length of a 100m fenced working zone is recommended.
- Public relations and awareness before and during the scheme – keeping the public informed.
- Maintaining permanent access to all doorways during working hours.
- Noise and dust pollution.
- Maintaining emergency access and coordinating delivery procedures.
- Disabled and visually impaired movement and access.
- Organised events.
- Seasonal shopping/busy periods.

With regards to site logistics, the following must be considered:

- Physical working areas – site staff and machinery operations.
- Works programme – balance between size of working areas/time on site.
- Fencing – it is recommended to be able to see through fencing in high street environments.
- Appointing a public relations agent.
- Providing access/ramps to all premises.

- Machinery – working within sound barriers and potentially cutting slabs off site.
- Health and safety – working within a public space, danger to site staff and the public.
- Organised release of information to the public including letters and door-to-door advice by the contractor.
- Phasing and transitional areas to tie in levels as the works progress.
- Site access, large machinery.
- Storage areas and movement outside the working zone
- Working hours.



Maintenance and Reinstatement

It is imperative that the paving and surfaces are maintained within the city centre.

It is not proposed to apply any sealant to the natural stone or concrete surfaces as to benefit from such an application regular cleaning with specialist equipment is necessary. Instead the following is recommended:

- Regular little removal from the surface
- Targeted stain removal for spillages / similar
- Avoid deep cleans with high pressure water jets
- Regular inspections for stability / defects

Consideration should be given to hold a limited stock at a local depot for the use of reinstatement / replacement – this could either be used directly by the Council or supplied to the relevant third party / utility company as part of the reinstatement agreement.

In line with the considerations for colour and modular size of the proposed granite paving, the specification of a prescribed band width with random lengths and a multiple source of complementary tones will allow the reinstatement to be more seamless than if a single source and size is used.

This details supplied in this document should be supplied to any third party / utility company undertaking work in the city centre. A like for like reinstatement and build-up is imperative to avoid future defects and appropriate key-ins using dowels / bars is necessary to avoid any differential settlement.

List of possible suppliers

The below are provided to assist with the understanding of the required products, correct at January 2019

Granite

Stonepave Ltd
Unit 26, Airways Industrial Estate, Santry, Dublin 17
Tel: 01 844 1200

Hardscape
89 Holywood Road, Belfast BT4 3BD
UK Tel: 028 9099 2500

Concrete products

Tobermore – Tegula
Marshalls - Tegula

Propriety mortars

Kilsarin
Piercetown, Co. Meath, A86 W820
Tel: 01 8026300

Kilsaran Priming Slurry –
https://www.kilsaran.ie/product/priming-slurry/

Kilsaran HSBC (High Strength Bedding Concrete) –
https://www.kilsaran.ie/product/hsbc-high-strength-bedding-concrete/

Kilsaran Rapid Setting Jointing Mortar –
https://www.kilsaran.ie/product/rapid-setting-jointing-mortar/

Larsen Building Products
Bishopswood, The Ward, County Dublin
Telephone: 01 8348255

Larsen Streetscape Priming slurry
http://www.larsenbuildingproducts.com/products/range/12/category/49/-/0/product/258/

Larsen Streetscape Fine Bedding Concrete
http://www.larsenbuildingproducts.com/products/range/12/category/48/-/0/product/256/

Larsen Streetscape Fast Setting Flowing Jointing Grout Mortar
http://www.larsenbuildingproducts.com/products/range/12/category/50/-/0/product/259/