



- Masterplanning
- Detailed Design
- Shared Surfaces
- Traffic Calming
- Permeable Paving

# paving

case study

GREENDYKES NORTH  
CRAIGMILLAR  
EDINBURGH



**Interpave**

THE PRECAST CONCRETE PAVING  
AND KERB ASSOCIATION



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# Introduction

This case study is part of a series exploring the application of current approaches to master-planning, urban design and 'place shaping', focusing on shared surfaces. It looks at how precast concrete paving, including permeable pavements, along with other high quality surfacing materials define the character of an innovative regeneration project in Edinburgh. Master-planning followed by comprehensive and careful detailed design ensure that these materials are successfully and consistently applied on the ground. These issues are discussed further in Interpave's *Planning with Paving* document, available via [www.paving.org.uk](http://www.paving.org.uk).

# Background

Master-planning and the considered design of external spaces incorporating precast concrete paving play an essential role in a 15-year vision to breathe new life into the Craigmillar area of Edinburgh – previously the fourth most deprived area in Scotland. To achieve this, the EDI Group is working in joint venture with the City of Edinburgh Council as the Urban Regeneration Company (PARC) responsible for revitalising Craigmillar.

A previous Interpave case study (available via [www.paving.org.uk](http://www.paving.org.uk)) considered the Wauchope Square area of Craigmillar, an interesting comparison with

this scheme as both aim to achieve the same master-planning goals, as set out by Llewellyn Davies in the 2005 Craigmillar Urban Design Framework (CUDF):

- *Bringing prosperity to the area in terms of jobs, security, and a family-friendly environment*
- *Breathing new life into the community – with schools, town centre, and other facilities alongside new housing*
- *Keeping the best of Craigmillar, making more of its potential in terms of people, and the cultural, historical and natural features*
- *Linking Craigmillar into the rest of the City both by physical connections and visually, by design – and bringing Edinburgh into Craigmillar.*

The CUDF sets the standard for new housing and streets in Craigmillar recognising that: “*streets are an important way of connecting the new development areas with existing Craigmillar and the structure of the city. The aim is to maximise the opportunities presented by streets to enhance the environmental quality and sense of place ... giving priority to people on foot, whilst recognising that this cannot mean squeezing traffic out of the area, or making life difficult for local businesses – existing and new. Craigmillar should be a place which is easy and pleasant to move around – whether on foot, bike or public transport. There is a difference between making it possible for people to use and park their cars and making them have to use their cars.*”



# Strategy

A master-plan was developed for Greendykes North by Caddell, in conjunction with Ben Hamilton Baillie (street design and movement consultant) and URS engineers, forming an extension to the approved CUDF with a site-specific framework and design brief. This was based on the principles of shared space, and the evolution of the 'woonerf' or home-zone concept for residential streets.

Here, shared space brings together all street users, including drivers, as part of the social world. The deliberate integration of traffic with other social activities reduces speeds and improves the relationship between pedestrians, cyclists and traffic. Precast concrete paving can play a key role, with its diversity of colours, surface textures, patterns and modular unit designs used to define areas and reduce speeds without signage.

Halcrow landscape architects were then commissioned as design team leader to develop the proposals to detailed planning and Road Construction Consent including a road safety audit. The aim of the phase of the project considered here is to provide: *"an innovative, sustainable, hard wearing, cost effective public realm with a strong sense of place."* The proposals aim to set a standard for best practice for home-zone and public realm design. The brief was not to design streets but three-dimensional spaces responding to the width and scale of the built environment in order to create successful streets with a legible hierarchy.



# Street Hierarchy

The North Greendykes project is characterised by a permeable and legible network of streets with a clearly defined hierarchy:

- **Greendykes Road** – serves the area and is designated as a boulevard main connector, incorporating space for the future Tramline 3, not part of this project.
- **Greendykes Avenue** – a traditional traffic calmed street with a design speed of 20mph.
- **Greendykes Terrace** – innovative shared space/home-zone areas with a design speed of 15mph.
- **Greendykes Mews** – shared space/home-zone areas with traffic calming using chicanes and a design speed of 15mph.



Alison Chisholm

# Paving Materials

A carefully controlled palette of hard landscape materials was developed, largely using various precast concrete paving products from different Interpave members. The limited range of paving colours selected has been enriched with subtle differences in surface textures and the grain of contrasting block styles. Each combination has been applied to specific areas of the different street types, developing a paving 'language' throughout the project. Concrete conservation kerbs have been used flush with paving as a border between panels of different paving. They also delineate pedestrian strips to help visually impaired people and reinforce 'kerbsafe' education in schools.

## Key

-  Textured granite aggregate concrete blocks in silver grey and charcoal. Fine textured to vulnerable pedestrian strip, riven elsewhere.
-  Rectangular concrete block permeable paving in buff – to parking areas.
-  'Tumbled' concrete setts in pennant grey and natural – to shared surfaces.
-  Concrete conservation kerb, 255mm wide in charcoal, laid flat.



# Greendykes Avenue

Greendykes Avenue not only serves this project but also links-in the adjacent development to the West, and is designed more as a traditional street with traffic calming. It is the major safe route to schools and has wider than average pavements with conventional concrete up-stand kerbs.

Speed reduction is reinforced with avenue tree planting and variations in road surface to indicate to drivers that this is not a standard street. However, it does consistently reinforce the language of concrete paving materials used throughout the project to differentiate uses, including buff coloured permeable paving for parking areas and conservation kerbs laid flush as delineators.



# Greendykes Terrace

Probably the most innovative part of the project, Greendykes Terrace utilises a single row of centre-street parking with two-way vehicle routes on either side - believed to be the first use of this layout in Europe. The diversity of choices offered to drivers makes them think and reduces speeds, and there is no need for vehicles to reverse. A complete absence of signage is ameliorated by the consistent use of the palette of paving materials and colours. The combination of the massing of buildings related to street width, large trees, positioning of street furniture and application of hard landscape materials all combine to define the character of the shared space.

Each shared space area is 5.5m wide but 1.5m of this is treated with a different concrete block paving and delineated with conservation kerbs, providing a perceived safe area for vulnerable pedestrians. Hard landscape features, known as 'Incidents', to reduce speeds – such as concrete cube seats – are installed at a maximum spacing of 25m. Pinch points are created by the strategic positioning of street furniture and changes in surface.

At junctions, where low speeds are essential, routes will converge to prevent clear forward lines of vision and further reduce speeds. As only a short section of the Terrace has been completed at the time of publication, the detail and implementation of this technique has yet to be tested.



# Greendykes Mews

Although perhaps less innovative than the Terrace, Greendykes Mews as completed does demonstrate a particularly successful use of home-zone design techniques, incorporating precast concrete paving. Again, street width matches the building scale - narrower this time to suit the 2-storey housing.

The shared surface design makes use of distinct panels of different concrete block colours and styles, bordered by flush conservation kerbs to give a highly structured feel. This formal approach, which is also applied to Greendykes Terrace, contrasts with that taken on the nearby Wauchope Square development (about which Interpave has published another Case Study) despite sharing similar aims.

The single shared space and permeable paving parking areas alternate to form a series of chicanes, combining to slow traffic. These islands also form meeting points for resident interaction and are emphasised by changes in surface material and planter walls. The private front gardens fronting this street with hedge boundaries are very much a part of the streetscape, giving a more intimate sense.



Alison Chisholm

# Permeable Paving

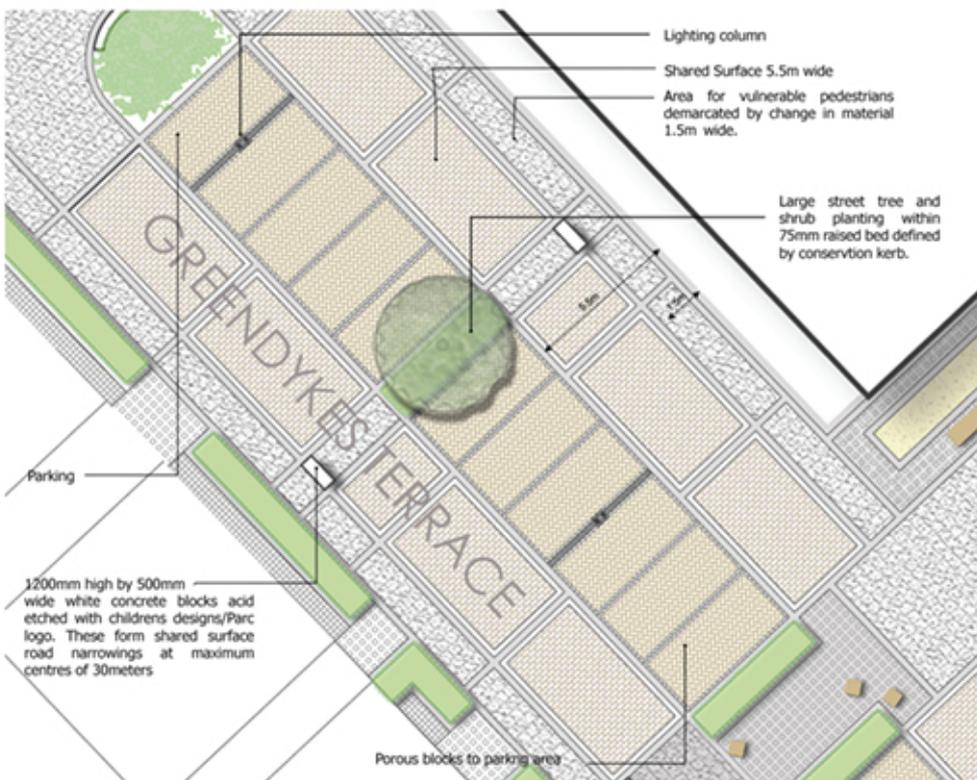
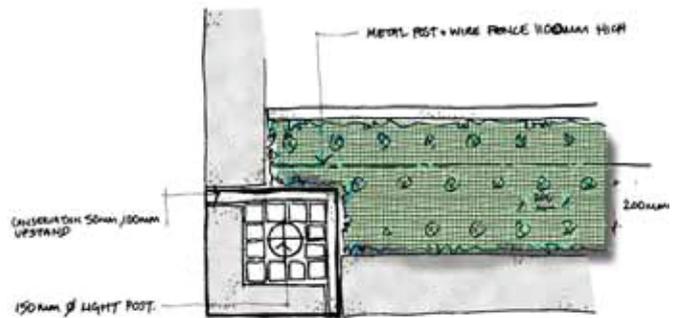
Concrete block permeable paving (parking areas) is used to drain all the streetscape areas, avoiding gulleys. Due to local ground conditions, 'System C' has been used, where all the water is attenuated and treated within the lined pavement construction, in this case before passing into the existing drainage system. It is hoped that future phases can utilise a full SuDS management train. Concrete block permeable paving here (and at Wauchope Square) is the first in Scotland to be adopted by the local authority.



# Paving in Detail

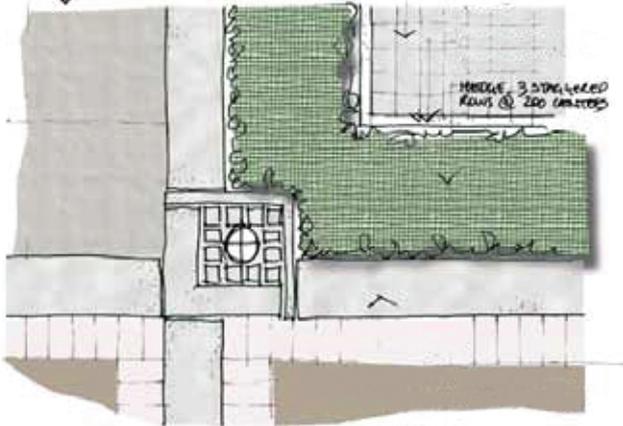
This project is characterised by particularly careful attention to detail, for example by using recessed manhole covers for block paving continuity wherever possible. In some cases, the design questions current practice – such as detailing around lighting columns, set in planting areas within the street and protected by a 75mm kerb upstand.

A similar, considered approach has also been applied to avoiding damage to paving surfaces during housing construction. Here, a temporary asphalt (DBM) surface, which forms an integral part of the pavement design, is used during building work, then covered with the final surface layers at the end of the project. In the case of permeable paving, the DBM is pierced to allow drainage through, as recommended by Interpave. Other Interpave guidance for permeable paving has also been implemented, such as coordination of service runs and their routing in front garden areas to avoid permeable paving.





Alison Chisholm



Alison Chisholm



# Paving in Practice

This is an innovative project where issues such as speed reduction and lack of signage have been addressed through detailed design and will be tested and refined in use. Early experience suggests that the project does provide safe streets with low speeds and which can be used by larger vehicles where necessary.

As part of a programme of continual monitoring, a safety audit will be carried out to ensure that the design techniques applied here work in practice and any lessons learnt which might influence future phases. In any event, the project does provide an inspirational example of what can be achieved using precast concrete paving to create distinctive, attractive and lively streetscapes for our towns and cities.



## Designer's View

Following a 2013 site visit, Interpave asked Halcrow's former Design Team Leader, Emily Peel Yates, for her views on the project –

### How was such an ambitious and innovative scheme achieved?

**EPY:** Teamwork made this project a success – an approach established by the client, PARC, from the outset. They knew they wanted a scheme that would raise the bar in terms of public realm design. Early in the project they organised a study tour for various stakeholders, ranging from housing to transport, to Holland to see as-built examples of the woonerf street design concept in the flesh. This created a team straddling public authority/private developer boundaries, with all members buying-in to the concept. This also extended to the contractors, Raynesway, who worked with the team to find innovative and cost effective solutions to deliver the client's aspirations.

### How successful is the hard landscaping design and material selection on the ground?

**EPY:** Overall, I am very pleased with how the limited palette of materials has worked. The colour and texture differentiation is subtle but, I feel, effective. These were by no means the most expensive materials available, yet demonstrate that through careful detailing and consideration high quality can be achieved without paying a high price. The project really does benefit from a lack of street clutter and signage, achieved by careful attention to detail throughout. There is a consistency yet simplicity to the overall design with a clarity which, I think, gives it a quiet grace and elegance. I very much hope that successive phases keep this palette of materials.



Alison Chisholm

### How effective are the shared surface designs in achieving the client's aims?

**EPY:** These areas seem to be well-liked and respected by residents. Cars are generally parked where signalled by the change in paving and traffic speeds appear to be low. It's still early days in terms of traffic monitoring, of course, but I am not aware of any accidents or issues with vehicles using the shared surfaces. The absence of signage and painted road markings has not been missed. And, despite the designed exclusion of guard-rails, there is no apparent vehicle damage to lamp-posts, street furniture, trees or paving edges.

## Were there any issues or lessons learnt from this first phase?

**EPY:** *It is interesting to see how the area has evolved as it has been inhabited. There have been concerns about a lack of defensible space in the scheme and I believe the hedges planted at the public/private interface have not formed an adequate barrier. Here, small hedging plants were used as a cost saving, some of which have been removed by residents – with both positive and negative results. Planted pots and colourful flower displays now stand where the hedges were planted. Their loss is a small price to pay and it's great that residents have taken ownership of these small areas facing the public realm.*

## Acknowledgements

Interpave acknowledges with thanks contributions from:

**Emily Peel Yates** – Design Team Leader, Halcrow (now Principal Landscape Architect Planning and Design AMEC)

**John Ramsay** – Associate Director, Urban Programs Landscape Architecture, Halcrow Group Limited (CM2Hill)

**Alison Chisholm** – Project Landscape Architect, Halcrow (now with Lothian and Fife Green Network Partnership)

This case study includes extracts, information and images taken from *GREENDYKES NORTH SHARED SPACE AND PUBLIC REALM – Detailed Design Report* (April 2008), courtesy of Halcrow.

Photos

(unless captioned otherwise): Chris Hodson.

Case study by Hodsons. [www.hodsons.com](http://www.hodsons.com)



Emily Peel Yates

## Precast Concrete Paving Principles

With precast concrete paving and kerbs, distinct, modular units and designed variations in colour, texture and shape can break up areas giving visual interest and a human scale not possible with monotonous, formless materials such as asphalt. In recent years, Interpave manufacturers have transformed this concept, moving away from simple, regular patterns and colours to expand an extensive palette of styles, shapes, colours and textures to meet current demands in urban design, matching – and often exceeding – the visual qualities of materials such as stone. This is a valid and sustainable interpretation of the requirement for 'local materials' in adopted guidelines. It is generally unrealistic on cost, availability and accessibility grounds to specify locally extracted stone which may have been used in the past, while imported stone fails to meet sustainability criteria.

**Essential requirements for paving materials, from Manual for Streets and other guidelines, can be summarised as follows:**

- visually attractive able to deliver distinctive local character
- capability for visual or tactile differentiation between distinct areas
- durable and maintainable with reliable product supply
- accessible to all with consistent slip and skid resistance
- well drained to avoid standing water and compatible with SuDS
- sustainable – in the widest sense

**More information on how precast concrete paving is uniquely placed to satisfy all these requirements can be found in *Planning with Paving*, via [www.paving.org.uk](http://www.paving.org.uk).**



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