

Halfway Community Park



SuDS used

- *Raingardens*
- *Swales*
- *Permeable paving*
- *Detention basin*
- *Geocellular storage*
- *Filter drains*

Benefits

- *Creation of a new multi-functional Community Park in under-used greenspace in an area where there was few outdoor opportunities for residents;*
- *Reduction of flood risk / impacts, will give a positive benefit to help lift the community up the deprivation index scale and improve community resilience and long-term sustainability as an active community.*
- *Assisting future regeneration of the Cardonald area by freeing up capacity in the constrained downstream drainage network.*
- *Enhancement of the natural environment including biodiversity and the landscape, whilst also moving away from the dominance of roads and car parking to improved footpath access;*
- *Provision of access to outdoor facilities, such as new play areas and a gym within the Community Park;*
- *The scheme will deliver a sense of place for the residents, whilst encouraging ownership and stewardship;*
- *The SUDS measures will provide improved surface water quality, with an aspiration in the future to divert flows which currently discharge into the combined sewer to a new blue/green link between two new urban parks,*

1. Location

Halfway Community Park is located in Cardonald, to the south west of Glasgow city centre. The full address is Halfway Community Park, 160 Moss Heights Ave, Cardonald, Glasgow G52 2UA.

2. Description

Moss Heights was Glasgow Corporation's first experiment in the use of high-rise flats in 1953, comprising 263 homes. The site, also known as Halfway Park, is 5.24ha and is situated in the Halfwayhouse Estate, adjacent to Berryknowes Avenue, Cardonald. The flats reflect an architectural philosophy of building modern, high density housing surrounded by large, often inactive expanses of green space. These large areas of green space, did not achieve their potential as useful outdoor spaces, creating instead 'green deserts'. The surrounding neighbourhood is a very urban, built up area and with the prevalence of high-rise housing where there is a desperate need for better outdoor facilities, and to make better use of underused open spaces. There were also a high number of families with children within the flats, with very limited access to outdoor play facilities.

The aim of the Halfway Community Park project was to transform an area of underused open space, which was previously rated low quality/poor by Glasgow City Council's open space audit and create a new urban park which included: reconfiguring space within the estate, introducing more diverse planting, the introduction of community growing and orchard areas, new paths, replacing roads and parking with more sustainable 'home zones', creation of new recreation and play facilities and the introduction of new green infrastructure.

The Park was to offer access to recreation facilities and resources for all ages, aimed at encouraging people to develop more active lifestyles to improve health and wellbeing, in an area within the poorest 5% for health inequality (SIMD, 2016). This includes natural and traditional play facilities for children, games space for young people and a green gym area for adults. The tree planting, wildflower meadow, herbaceous beds and improved

paths networks benefit the whole community, as will the community growing space and orchard which will enable access to free fresh vegetables and fruit, thus encouraging healthy eating and helping to address food miles and food poverty which is prevalent in the area. The Southside Housing Association proposals secured full planning consent in December 2015 and construction was completed in early 2020.

Glasgow City Council became aware of Southside Housing Association’s proposals whilst processing their Hillington and Cardonald Surface Water Plan (SWMP) and it became apparent that the creation of the park offered an opportunity to integrate flood risk management with the new green infrastructure planned for the park. Retrofitting surface water management measures within the upper catchment, provided the opportunity to reduce flood risk downstream by storing runoff and releasing it at a controlled rate, thereby creating capacity in the combined sewer and fundamentally changing the water management around the large tower blocks away from the traditional model to one using green infrastructure interventions.

The topography of the Halfway Community Park proved challenging, as the flats are located at the top of a steep sided drumlin. This meant that innovative surface water management measures were required, with the focus on managing runoff at source. However, the steep slopes did provide the opportunity for some great slides and zip wires within the natural play areas. A variety of SUDS measures have been introduced, to allow us to determine which work best, in specific circumstances, allowing both Southside Housing Association and Glasgow City Council to apply lessons learnt to a further retrofit scheme planned for a similar estate located to the north of Cardonald, at Queensland Court and Gardens.

3. Main SuDS components used

Prior to the creation of Halfway Community Park, runoff from the existing roofs, roads and car parking areas within the estate was routed, un-attenuated, to the Scottish Water combined sewer network. Runoff from an area of approximately 1.45 ha of impermeable spaces will now be managed using series of SuDS measures. The focus was to manage runoff at source using:

- a series of raingardens;
- a series of swales;
- permeable paving.

These then discharge into either:

- a geocellular structure located at the eastern perimeter of the site (see image 1 below); or
- a detention basin to manage flows discharging in a westerly direction.

To deal with exceedance flows a football pitch has been constructed which not only serves as a sport facility but also has the multi-functional purpose of providing flood storage. The runoff then discharges into the existing Scottish Water drainage network at a controlled rate.

4. How it works

The Scottish Environment Protection Agency’s Flood Risk Management Strategy for the Clyde and Loch Lomond District specifically refers to Hillington and Cardonald and states:

'The area must be covered by a surface water management plan or plans that set objectives for the management of surface water flood risk and identify the most sustainable actions to achieve the objectives'.

The SWMP identified a series of options to manage surface water flood risk within the catchment, including upstream of Berryknowes Road, where Moss Heights is located.

The Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) is a partnership formed by organisations involved with the operation of the sewerage and drainage network in the metropolitan Glasgow area. The Hillington/Cardonald SWMP forms part of the wider strategy for the MGSDP. The Vision of the MGSDP transform how the city region thinks about and manages rainfall to end uncontrolled flooding and improve water quality. The vision will be realised through partnership working which will be shaped by the eight Guiding Principles:

- Enhancement of our urban biodiversity and landscape;
- Reconnection of our waterways;
- Design for the severity of the rain;
- Presumption that surface water will be kept on the surface;
- Creation of an integrated network of blue green networks;
- Integrated urban master planning and design;
- Sustainable and affordable drainage solutions; and
- Climate-change ready.

The preferred options to manage surface water flood risk in Hillington and Cardonald have been designed to align with this vision, with the solutions identified as being most sustainable progressed to detailed design and construction phases.

The vision from the outset for Halfway Community Park, was that surface water should be viewed as an asset to harness, not as a problem. Rather than putting water underground, it was considered to be a resource which could be used to help create natural green-blue areas and deliver a place for the public to enjoy. The drainage strategy therefore was to manage surface water above ground wherever possible and that below ground solutions should only be used when there was no other viable alternative.

The main challenges were the steepness of the slopes, a highly constrained space, numerous existing services and the challenge of minimising disruption to the residents.

The majority of SuDS are therefore source control measures, designed to manage water as close to where it falls as possible. By providing a series of smaller measures upstream, this allowed the amount of storage required using site controls (namely the detention basin and geocellular storage facility) to be reduced. This was important as available space to accommodate these measures was restricted by the topography of the site. One the additional benefits is that the quality of runoff has been improved through the introduction of a management train approach. At present the runoff ultimately discharges into the combined sewer, meaning that treatment of the runoff is less important, however, the aspiration is to create a blue/green link to the watercourse.

A series of swales manage surface water generated by the car parking areas, located to the rear of the flats. These have all been designed to be shallow with gentle side slopes. Several car parking areas immediately adjacent to the flats and to the west of the estate now consist of permeable paving (image 2) to control and treat runoff.

Raingardens serve paved areas to the front of the flats (image 3), which formerly consisted by access roads which have been replaced by 'home zones'. Runoff enters the raingardens via sheetflow through gaps between the kerbs. Basic planting has been carried out by the construction contractor, however, it is the intention to engage with local community groups (such as the Friends of Halfway Community Park Group) and local schools, to carry out further planting and to keep these facilities litter free.

Roof drainage has been separated from the wastewater drainage. It now discharges to the SuDS basin south of the flats, for treatment and attenuation prior to discharge at the agreed runoff rate into the Scottish Water existing network.

The permeable paving has also been used as a pilot for Southside Housing Association, to determine the effectiveness and quantify maintenance requirements, as they had limited experience of using such measures.

A rainwater harvesting tank has been introduced to the west of the site, which will serve the Community Growing Area. This will allow water to be stored and used as an accessible water supply by the residents.

The detention basin provides the majority of the storage requirements for the west side of the site. Due to the constrained nature of the site, to reduce the area required to accommodate the detention basin and ensure that water depths are kept to a minimum, a second basin was created to manage exceedance flows. The primary purpose of this basin is a football pitch/sport facility. However, once the capacity of the detention basin is exceeded, flows are directed to this facility, which provides additional storage.

A geocellular storage area provides site control, for the east side of the catchment. The feasibility of above ground SuDS measures were explored, but due to the topography of the site and site constraints, it was agreed that below ground storage was the only option.

The discharge rate is restricted to 12.9l/s for the western catchment, with an attenuation volume provided of 421.5m³ (243m³ by the basin, 28.5m³ by the raingardens and 150m³ by the football pitch). The eastern catchment has a restricted discharge rate of 9.7l/s, with an attenuation volume of 141.4m³ provided (120.7m³ by the geocellular aquacell measure and 20.7m³ by the raingardens). The surface water network for the site has been designed to accommodate the 1 in 200 year plus 30% climate change event.

In addition to the water management interventions, the design of the park was expressly about bringing an underused, neglected space back into use, for people and nature. The park includes recreation, play and social spaces, such as play parks, the sport and exercise spaces, the growing spaces and public realm improvements for seating and gathering. A range of diverse planting, such as native trees, wildflower meadows, raingardens and herbaceous beds has created a mosaic of diverse habitats.

5. Specific project details

The investment in Halfway Community Park has transformed empty open space by improving the quality, accessibility and quantity of green infrastructure in the Cardonald area of Glasgow. The project focused on improving the attractiveness of the area as a place to live and opportunities were provided for local residents to take part in the development and use of the space, including creation of additional training and volunteering places to address inequalities and improve wellbeing. The Friends of Halfway Park provided the opportunity for residents of Moss Heights to help inform the design throughout the process. The environmental enhancements within the park include:

- Creation of a community space;
- Removal of the road at the front of Moss Heights flats into a pedestrianised 'home zone' area;
- Creation of a natural play area for the large number of children and families in the area;
- Improved green spaces so that both older people and families can enjoy them;
- Increased tree and shrub planting;
- The introduction of SuDS to manage surface water flood risk.

The above activities have created greater biodiversity and more useful space for passive and active recreation. It has improved safety by creating better separation of vehicle and pedestrian only areas (home zones) and introduced enhanced private green space. In addition, it has created food growing spaces and an orchard for local residents and play areas for children and green gym space for adults. The project has delivered physical improvement primarily through the implementation of the landscape enhancements, but key to its success is the potential for the Park to tackle social exclusion and deprivation in an area, as well as reducing flood risk.

The diverse range of funders demonstrates the collaborative nature of this project. It was recognised at an early stage that multiple benefits could be achieved through the integration of drainage interventions with landscape design for the new park, optimising opportunities to further enhance the greenspace and providing wider place making benefits to support regeneration. Glasgow City Council and Southside Housing Association decided to pool resources, so that not only was the cost the environmental improvements shared, but the partnership enabled additional funding opportunities to be identified by generating confidence and interest in what we are trying to achieve. In addition to funding from Southside Housing Association and Glasgow City Council's Glasgow City Region City Deal, funding was also secured from the ERDF Green Infrastructure Fund, ENV 2 Funds, EB Scotland and the Glasgow Tree Lover's Society. Working collaboratively has meant that we have avoided duplication of effort, created a cohesive multi-discipline project that has appeal for funders, and pooled expertise, which has assisted in our ability to provide integrated solutions that deliver multiple benefits.

Halfway Community Park is unique in the south west of Glasgow, as a public park owned by a Housing Association and registered charity, rather than being managed by the local authority (Glasgow City Council). This is a third sector led project, and to encourage wider community participation, the Friends of Halfway Park Network has been formed. The project will be a catalyst for the development and delivery of numerous community based initiatives linked to the enhancement of the park. These initiatives will involve several target groups including:

- disadvantaged young people (employability projects to set up green infrastructure in conjunction with the appointed contractor and local training agencies / colleges);
- young people at risk of involvement in anti-social activities (community based project and youth development work in conjunction with community safety Glasgow and SWAYED youth services);
- people affected by poor health and isolation (green gym events and grow your own food projects in conjunction with Urban Roots)
- ethnic minorities (community projects to include and integrate people from ethnic minorities in the life of the community).

A range of activities are being delivered within the Park, including environmental education and conservation opportunities such as gardening, wildflower and community planting programmes with the input of Glasgow Tree Lovers Society and Commonwealth Orchards.

Design of the raingardens involved both Landscape Architects and Civil Engineers knowledge sharing on both drainage and planting design to ensure the system was fit for purpose and meets biodiversity and landscape values set out. Identified at an early stage was the critical need for the bioretention growing material to meet specific performance criteria. This was ensured through a robust testing and checking process prior to delivery and then further checked upon installation.

Construction of the raingardens was challenging due to the main contractor having no experience in delivery of such SuDS measures. Designers worked closely with the Contractor to ensure the SuDS theory and application was implemented on the ground to ensure a fit for purpose drainage system was installed.

6. Maintenance & operation

The maintenance of the SuDS measures will be carried out by Southside Housing Association, as part of their overall grounds maintenance. The SuDS have been specifically designed to be low maintenance, including the use of water tolerant, hardy plants. The Friends of Halfway Park Group have agreed to assist with routine maintenance activities such as litter picking and re-planting should it be required. The adjacent primary school has also been approached, as part of the community initiative, to assist with planting.

7. Monitoring and evaluation

Southside Housing Association has an established approach to monitoring and tracking the effectiveness of its services and regeneration activities. These systems have been adapted in the gathering of information to ensure the successful delivery of green infrastructure investment and all outputs and outcomes are achieved regarding physical, social and economic targets to regenerate Moss Heights. Southside Housing Association have set appropriate targets for outputs and outcomes and gather quantitative and qualitative information to track, monitor and evaluate the success and achievements of this project.

The physical outputs include quantifiable improvements with numbers of new native trees, wild flowers and heritage species planted; new community growing spaces and orchards created (m²); homezone to replace roads (m²); length of new paths (m); new play areas and recreational facilities (m²). This will evaluate the quality of workmanship which will be achieved by use of highest standard robust materials, plants and equipment to ensure a lasting legacy can be assured.

The social and economic outputs include quantifiable numbers of people engaged in the project from the outset and included in the new 'Friends network; the number of employability places created; the numbers of trainees completing programme and achieving qualifications; the numbers of volunteers involved in specific park projects such as orchard planting, community growing and cycling projects. Southside Housing Association plan to carry out surveys to identify satisfaction with the Park improvements and programmes. The Housing Association will also continue to obtain community and park user feedback on the project to ensure an ongoing response to meeting needs and priorities.

The measurement of success in terms of flood risk, will be the reduction in the frequency and extent of flooding in the downstream drainage network, as well as the amount of regeneration which occurs within the catchment.

8. Benefits and achievements

In terms of flood risk, the Halfway Park project forms an integral part of Glasgow City Council's resilience and climate change adaptation strategy, allowing the city to effectively manage and mitigate the impact of the predicted increase in the severity and frequency of flooding incidents. The project has introduced new / enhanced, multi-functional, green / blue infrastructure such as SuDS basins/raingardens to the area, which will create quality public spaces, manage rainfall / uncontrolled flooding, improve water quality, combat urban heat island effects and create system capacity for future development.

The proposals have transformed sterile open space by improving the quality, accessibility and quantity of green infrastructure in the Cardonald area. The project offers access to recreation facilities and resources for all ages aimed at encouraging people to develop more active lifestyles to improve health and wellbeing, in an area within the poorest 5% for health inequality (SIMD, 2016). This includes natural and traditional play facilities for children. Tree planting, wildflower meadow, herbaceous beds and improved paths networks will benefit the whole community.

This one of the first project of its kind in Glasgow, where water management is holistically integrated into greenspace improvements, and will provide inspiration, as well as learning, for similar projects across the city. This is already being demonstrated by Southside Housing Association and Glasgow City Council developing their partnership and replicating the project process at another Southside Housing Association property in Cardonald, Queensland Court and Gardens.

The project will also have an impact on resource efficiency, as by taking flows out of the combined sewer network this will reduce the amount of water discharging to the treatment works, thereby reducing the load which needs treated and associated energy costs. In terms of climate change, the proposals will create greater resilience in the drainage network by managing flows prior to discharge into the combined sewer network. Managing water on the surface means that the capacity of the drainage network is not restricted by underground pipes and tanks. Should there be an issue, this is likely to be immediately apparent, rather than being hidden below ground, allowing mitigation measures to be employed at an earlier stage.

In addition, there will be a legacy of community engagement and awareness. The Friends of the Halfway Community Park Group was established to enable local people and groups to be involved in the planning and use of the Park through a regular programme of community events and thematic workshops to promote community participation. This group will continue to be involved in the future operation of the park.

The non-flood related benefits of the SuDS element of the scheme were assessed using the Benefits of SuDS Tool (BeST) (2016) and utilising supporting guidance provided with the tool. The BeST analysis of monetised wider benefits achieved by the measures predicts whole life (PV) benefits of £2,637,950. In terms of flood risk, hydraulic modelling suggests that the retrofit measures are expected to provide flood volume reduction for the 1 in 200 year plus climate change event of 647m³.

9. Lessons learnt

Multiple lessons have been learnt from the Halfway Community Park experiences. The key points are as follows:

- It is essential that the community are involved in shaping the proposals from the outset and have the ability to inform the designs as the project progresses. This community involvement should be retained after the works are complete, so that they retain a sense of ownership and are willing to assist in the ongoing management of the park;
- We have learnt from our mistakes and are applying our experience a similar SuDS retrofit project at Queensland Court and Gardens in Cardonald. For example, we now understand the importance of retaining parking areas for local residents during the construction phase of the development. This was something that was communicated by the Friends of Halfway Park Group throughout the process;
- We know that collaborative working can be extremely successful and we now have a structure which can be applied to other projects i.e. Queensland Court and Gardens.
- By pooling resources and knowledge, we are delivering much more than we originally envisaged. This also appealed to funders, as you could demonstrate best value, and the multifunctional nature of the project broadened the eligibility of the project to different funders.
- There will always be technical challenges associated with retrofitting SuDS into existing spatially constrained urban development, but these can be overcome by working collaboratively;
- Multifunctional SuDS are ideal in constrained sites and can be used in parks and play areas, as long as the safety is considered from the outset and standing water kept to a minimum.

10. Interaction with local authority

Glasgow City Council, supported by Glasgow City Region City Deal funding, provided grant funding in support of the project. The works at Halfway Community Park are just one element of retrofit schemes which are being constructed as part of the Hillington and Cardonald Surface Water Management Plan. The vision for Halfway Community Park has been replicated in other areas of the catchment, with a focus on using surface water as a catalyst to deliver other environmental improvements. The Council were actively involved with the project from the design process right through to construction. They have also ongoing involvement with community events. The aspiration for the Council is for the Halfway Community Park to be used as an exemplar site, providing a case study showing what can be achieved in a constrained space and a steeply sloping site. It also demonstrates what can be achieved if organisations work collaboratively. ENV2 funding was also provided by the Council to help fund the play facilities.

11. Project details

The project commenced on site in March 2019 and was completed in December 2019.

Capital Cost was £1,785,000 (exc. VAT)

Design & Other Fees was £147,820 (exc. VAT)

12. Project team

Funders	<ul style="list-style-type: none"> • Southside Housing Association • Glasgow City Council/Glasgow Region City Deal • ERDF Green Infrastructure Fund • EB Scotland • Glasgow City Council ENV 2 Funds • Glasgow Tree Lover’s Society 	
Clients	<ul style="list-style-type: none"> • Southside Housing Association 	
Designers	<ul style="list-style-type: none"> • Concept – ERZ • Design & Delivery – Ironside Farrar Ltd 	
Contractors	<ul style="list-style-type: none"> • RJ McLeod (Contractors) Ltd 	
Other	<ul style="list-style-type: none"> • Friends of Halfway Park 	



Image 1: Geocellular structure under construction



Image 2: Permeable paving serving car parking areas



Image 3: Raingardens in front of flats

Image 4: Football pitch/flood storage area under constructio

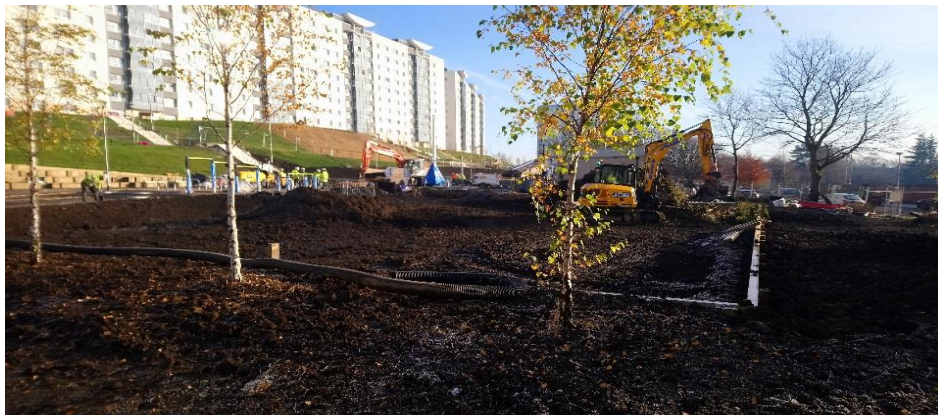




Image 5: View from the raingardens, down the slope to the play areas, football pitch / storage area and basin.



Image 6: View up to the flats from the play area, showing the steep slope and various planting options used.