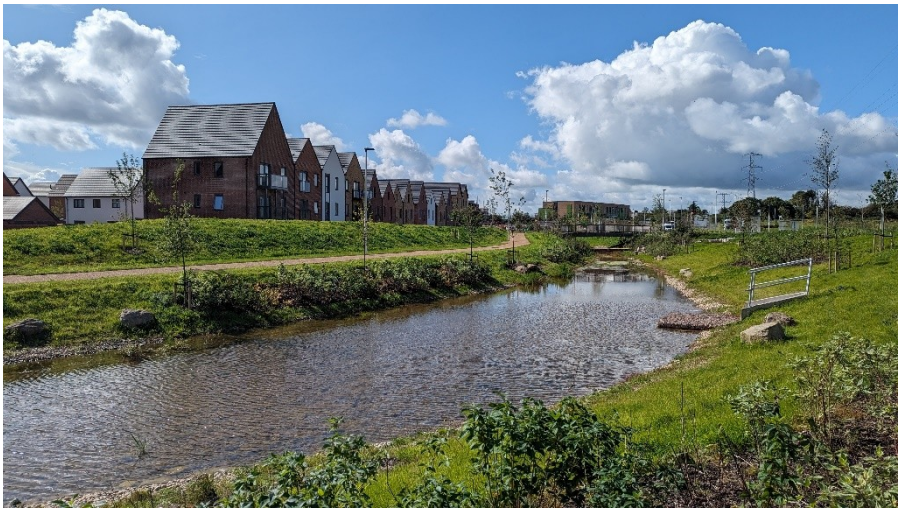
Plasdŵr Gateway Linear Park
Submitted by Arup

Awards category
New housing development – large (more than ten units)



Lead or collaborating organisation(s)	Redrow, Arup, Walters, Pegasus, SJM, Mott MacDonald
Location of SuDS	ST 13249 79172

1. SuDS overview

SuDS components used	• Swales • Ponds • Weirs • Tree pits • Cascades • Vegetated headwalls • Bridge over swales • Water compatible planting
Size of the scheme and its local context	The scheme forms the entry to the Plasdwr residential development scheme, which is a 7,000 dwelling multi decade development including a new district centre, one secondary school, four new primary schools and 400 acres of green space. The entry to the site was proposed to form an exemplary landmark of SuDS and public open space to create a high quality area with biodiversity and amenity.
Approximate age of scheme (years)	1 year since construction completed
Benefits of the scheme	• High quality treatment and attenuation of surface water runoff, designed prior to SAB legislation being introduced • Incorporates cycleways, play areas and water features to provide a place to be enjoyed by generations of new and existing communities, creating a legacy. • Over 70% of the Gateway Linear Park is landscaping including swales, ponds, wildflowers, shrubs and over 140 trees.
Briefly describe the scheme	The Gateway Linear Park is a flagship, collaborative SuDS project, with drainage, landscaping and amenity at the heart of the highway design process. It is a landmark entrance into the Plasdŵr development, paving the way for future sustainable urban design within the development. The highway was designed with sustainable drainage at the forefront. A series of swales adjacent to the highway act to remove pollutants at the source, and landscaped basins reduce flood risk within the development and in the downstream DCWW surface water drainage network. The Gateway Linear Park leads to Groeswen Primary School, encouraging active travel for pupils, with safe routes to walk and cycle. Thoughtfully positioned benches, play equipment and a bespoke timber composite footbridge allow the local community to enjoy the area. Shared footway cycleways provide cyclists with a safer, off road route alongside the primary spine road, and ample opportunity to rejoin the carriageway on quieter residential streets. A bus route through the site prioritises public transport users.

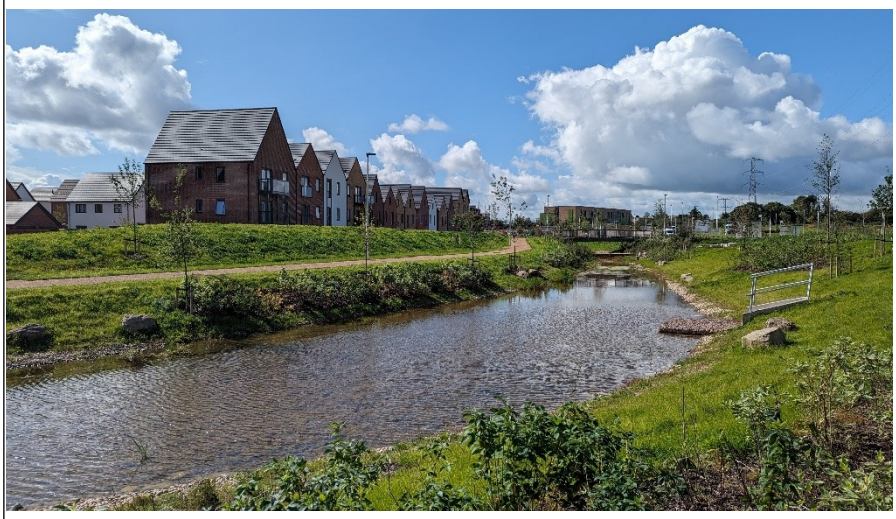
2. SuDS details

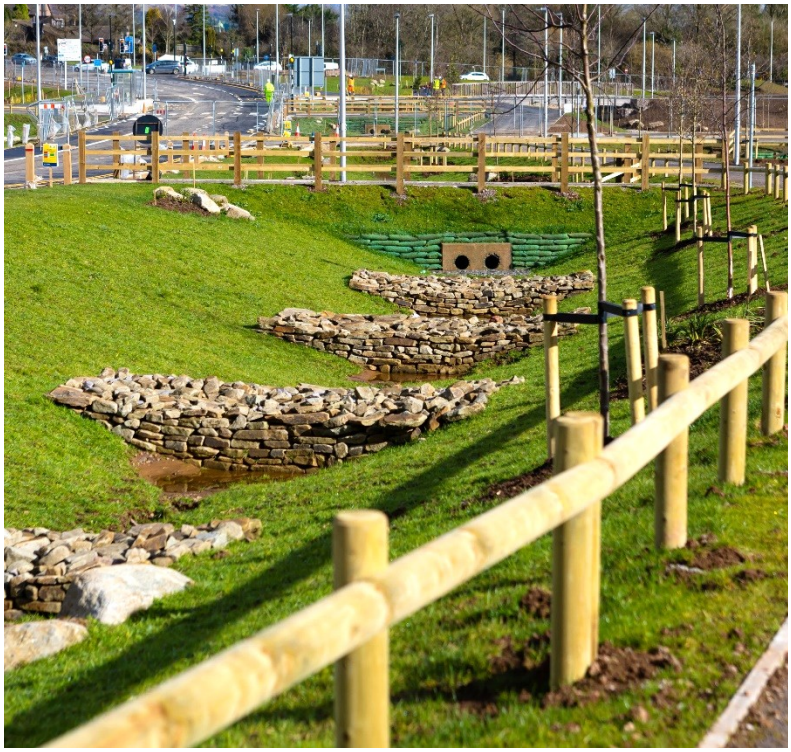
No.	Question	Answer
1	What difference has this scheme made to the local community or area?	The design principles were based on legacy, providing a place to be enjoyed by generations of local people. The use of nature-based solutions contributes positively to amenity and biodiversity. The scheme includes cycleways, play areas and water features incorporating new modern sustainable drainage systems in an innovative way. The park has been designed with a walk and play approach, with play equipment spread throughout the park. The project was completed at the same time as completion of a new primary school, allowing the park to be used as an attractive active travel route for parents and children from the onset.
2	What is exceptional about this scheme beyond a standard approach?	The key principle of this scheme was to combine engineering and landscape design to create an attractive and functional entrance to the site. Swales separate the highway from the footway allowing sheet runoff to maximise the swale efficiency. This then allows the footways a feeling of separation from car traffic, making the journey through the park more enjoyable. Landscaping makes up 70% of the area, with significant considerations of biodiversity and amenity. The area fuses the elements of placemaking with highways and SuDS to create a landmark space.
3	How much work went into getting this scheme realised?	The original concept for the site was to create a landmark for future generations. The design developed from this concept to reimagine the way that highways, surface water and public spaces interact to create a positive experience for all. Regular engagement with all stakeholders (including Cardiff Council, DCWW, Redrow, land owner etc.) was essential to align visions of all parties into the final design. Quality was at the forefront of design and construction. Trial areas were constructed by the Contractor to agree the details between the landscape architect and the contractor before the works were rolled out across the scheme.
4	Is this scheme part of a masterplan or integrated into other initiatives?	This development forms part of the wider masterplan for the Plasdwr site, forming part of the 400 acres of green space located across the site. The scheme is built to be a gateway into the development by providing a high quality public open space which then leads into future areas of development, including a district centre with retail and restaurant areas, and residential parcels. The SuDS have been designed to allow future development to connect into them, and to

		provide a high quality benchmark for the result of the site.
5	What value does this scheme provide to the local area and beyond?	The existing site was fallow agricultural land which has of low biodiversity and did not providing amenity benefit. The scheme introduces enhance biodiversity through the introduction of permanently wet open water bodies and variety of planting, and amenity benefits through the introduction of new routes for pedestrians, safe cycling areas and play equipment. The project is pioneering the use of SuDS across Wales, and is an early adopter of the SAB principles which are currently under consideration for England. The project is often used as an example for best practice SuDS within Wales and the wider UK.
6	What challenges/problems needed to be addressed to realise this scheme?	Within the site there were several strategic utilities which supply Cardiff. There were overhead 132kVs within the site, a 600mm water main which was in poor condition and a high pressure gas main which was crossed both with drainage and highways. The project worked with a Contractor in Early Contractor Involvement to identify key risks and collaboratively undertook trial pits to confirm the levels of these utilities. The team then worked closely to reduce the amount of crossings of these utilities and manage these issues.
7	How does the scheme address related issues such as water scarcity, nutrient neutrality, or biodiversity net gain?	The project introduced significant biodiversity benefits into the local area through the introduction of 140 trees, 2400m2 of permanent water and large amounts of wildflower meadow planting to an area which was previously fallow agricultural land. Since the scheme has been established, there have already been new species present on the site including nesting birds and invertebrates. Consideration was also given to reducing carbon across the project, with vegetated bag headwalls providing a reduction in embodied carbon by 8%.
8	Is learning from the scheme continually captured and communicated? Please give examples.	The scheme has been used as a case study for SuDS across Arup and used as a benchmark project by Cardiff Council. The project has been used across the UK as an example of good SuDS implementation in creating a positive public space, and the design team have presented across the UK, India Middle East and Africa Arup region of the benefits but also the learning points from the project. The project is being used as a case study of exemplar SuDS by CIWEM as part of an upcoming conference on successfully implemented schemes.
9	What approaches/measures are taken to ensure the scheme is properly managed and maintained?	As part of the planning approval, a costed maintenance plan had to be agreed with Cardiff Council. This included a list of regular maintenance activities for both the engineering elements and the landscaping across the scheme. The project is actively managed by the Contractor currently as part

		of a 5 year after care programme, with the design team regularly visiting the site to ensure that any landscaping which requires replanting is done appropriately to ensure that the area is kept in good condition while vegetation establishes.
10	Have you collected any feedback on your scheme? What do people say about it? Can you provide any quotes?	Client feedback: Redrow Homes are delighted with the collaborative design development and construction of the main entrance into Plasdŵr. The design team and contractor has helped to deliver an exemplar project which is innovative and of high quality creating an immediate sense of arrival and place. The team worked swiftly and collaboratively to overcome issues that occurred on site, and worked together to ensure a high quality finished scheme. The design principles were based on legacy, providing a place to be enjoyed by generations of both new and existing communities. The use of nature based solutions contribute positively to amenity and biodiversity.

3. **Supporting materials**

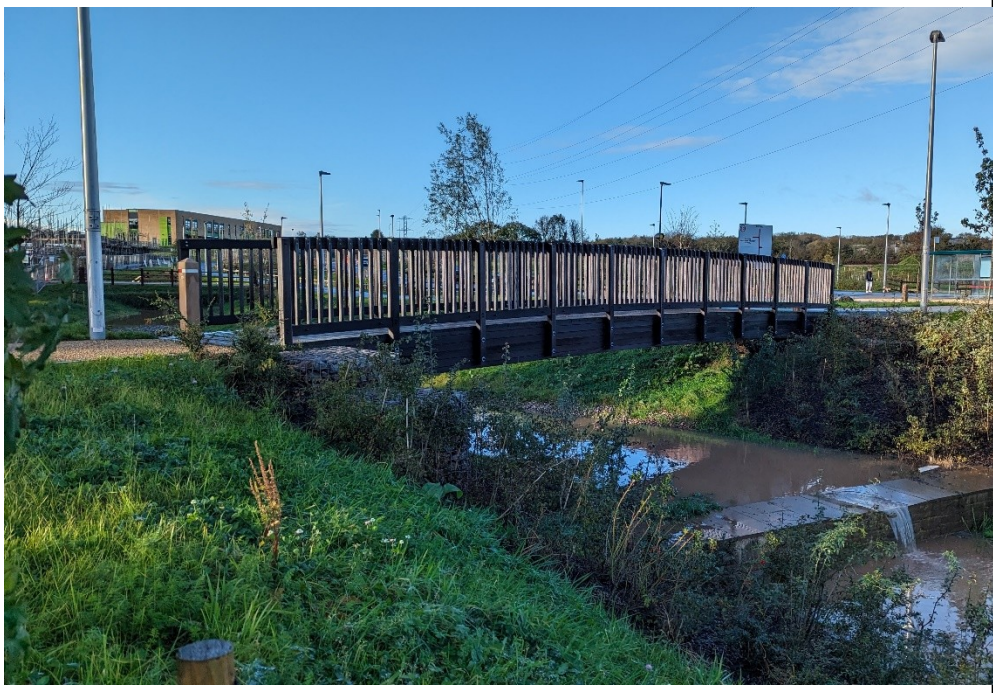
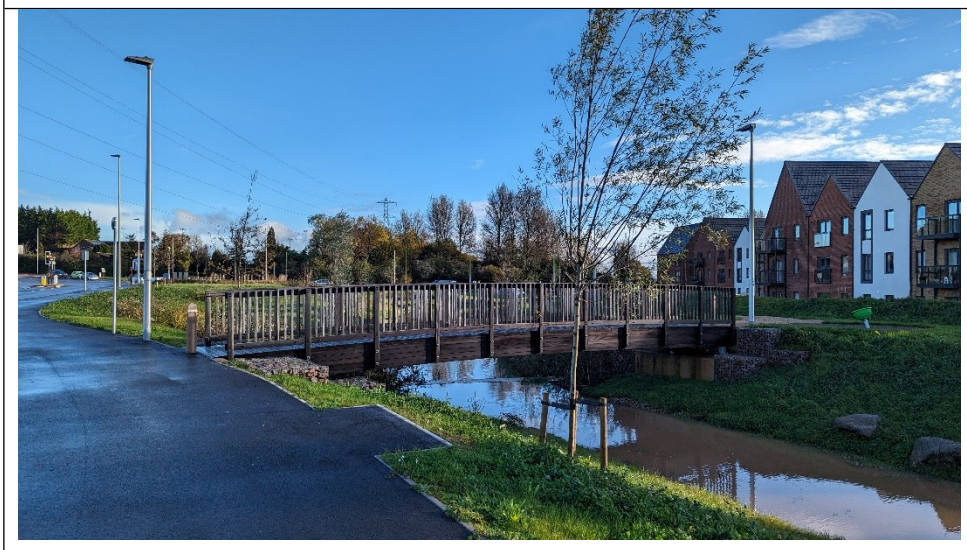
Image (low resolution)	**Image credit**
 The Gateway Linear Park includes two linear attenuation basins and interconnected swales either side of the highway. The basins and swales form an integral part of the landscaping, with housing fronting onto the area, being crossed by a timber composite footbridge, play equipment and benches being installed to allow people to enjoy moving through this area.	Arup

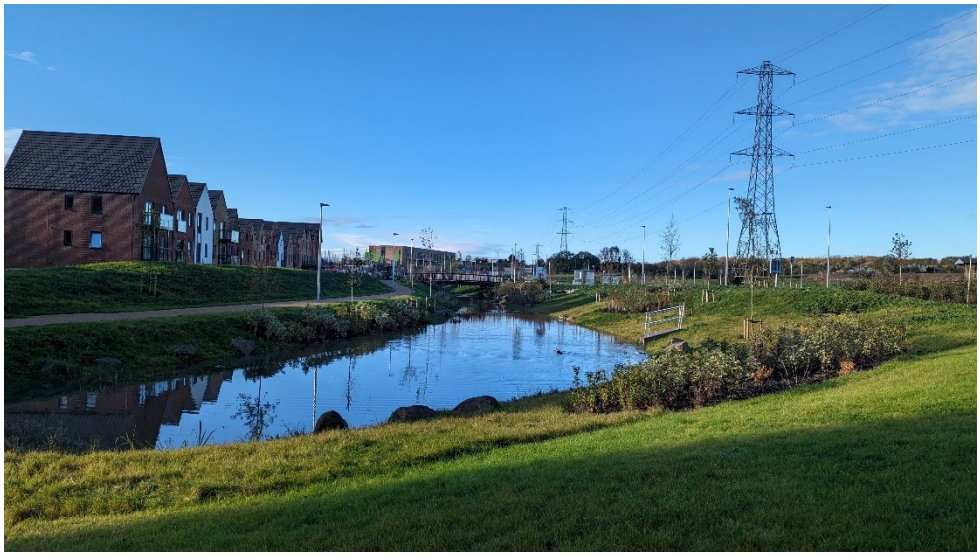


Dave Powell Photography

Swales were used to allow sheet flow of water from the highway and adjacent footway on the surface. The swales reduced the water pollution across the site.

Due to the gradient, check dams were required, which the contractor constructed to resemble dry stone walling to improve the aesthetic of the project.

 The timber composite bridge across the basin creates a strong visual feature in the landscape and allows people to stop and appreciate the SuDS across this scheme. There is a weir located at this location and from this picture it is possible to see the water flowing over this, again creating a SuDS water feature for this area.	Arup
 Pedestrians cross the footbridge to connect to the wide cycleway footway which has been installed to encourage cycling across the Gateway Linear Park.	Arup

 The improved biodiversity has already seen different species such as wildfowl and invertebrates visit the site. It is hoped that the introduction of this variety of habitats will encourage the establishment of a biodiverse area which will also benefit people as an amenity area.	Arup
 **The Gateway Linear Park is 70% green space, with 2400m2 of permanent water added to the landscape and 140 trees planted. It has transformed an area of private land through the positive use of SuDS into an area which people can enjoy for amenity and biodiversity and forms an important part of the local community.**	David Powell Photography