

FIND YOUR

FLOW



WITH

SUPERFLOW

AGGREGATES



CONTENTS

- 04 Introduction to SuDS
- 06 Sustainable Solutions
- 08 Infiltration and Run-Off
- 10 Product and Application Selection
- 12 Engineered or Hard Landscaping
- 14 Surface Types
- 16 Water Management with SuperFlow
- 18 SuperFlow Product Range
 - 19 Type 3 Aggregate
 - 20 2/6 Aggregate
 - 21 4/20 Aggregate
 - 22 10/63 Aggregate
 - 23 1/4 Aggregate
- 24 SuperFlow Premium Product Range
 - 25 SuperFlow SuDSAgg
 - 26 SuperFlow 20
 - 27 SuperFlow 63
 - 28 SuperFlow 6
 - 29 SuperFlow JointAgg

SuDS WITH AGGREGATE INDUSTRIES

Climate change is the main threat for us as a society as we live with the consequences of global warming. Extreme weather events, like heat waves, storms and droughts, are already more intense and more present in our lives. This presents us with the greatest challenge of our time.



In the UK, ever-changing weather systems, increasing urbanisation and rapid run-off have put a tremendous strain on conventional storm water drainage systems. This has resulted in sewers and culverts becoming overloaded, causing floods and contaminating natural waterways.

Sustainable Drainage Systems (SuDS) provide an alternative approach to traditional drainage systems. They mitigate many of the adverse impacts of storm water run-off on the environment in terms of both volume and pollutants.

WITH A BREADTH OF EXPERTISE AND SOLUTIONS, AGGREGATE INDUSTRIES HAS ALWAYS BEEN AT THE FOREFRONT OF RESEARCH WORK REGARDING MATERIALS FOR USE IN SUDS SYSTEMS

Initially as part of the research team contributing to PPR 482-A pilot scale trial of reservoir pavements for Drainage Attenuation published by the Transport Research Laboratory (TRL) investigating the use of SuDS solutions. This subsequently contributed to HD221/18 within the Design Manual for Roads and bridges. We also contributed to CIRIA's C753 document – "The SuDS Manual".

OUR SUDS SOLUTIONS WORK BY TEMPORARILY RETAINING AND SLOWLY RELEASING RAINFALL BACK INTO THE WATERWAYS IN A CONTROLLED MANNER

This helps prevent floods, while allowing natural processes to break down pollutants which would otherwise impact further downstream. SuDS became a legal consideration for all new developments per the Flood & Water Management Act 2010 and was integrated into Building Regulations in 2015.

THE NEED FOR SUSTAINABLE DRAINAGE SOLUTIONS

FLOOD POTENTIAL

As development increases, so do run-off speeds and volumes. Their rapid delivery into the local water courses can cause flooding downstream, resulting in danger to life and damage to property, or erosion and destruction of natural habitats.

POLLUTION

Traffic, hard surfaces and increased run-off can increase the risk of pollutants, which are literally washed off the streets into the water catchment, contaminating the downstream water supply.

CLIMATE CHANGES

It is generally accepted that the UK's climate is changing and that our weather is becoming more extreme. Paradoxically, in the short term, it is not the overall levels of rainfall that influence the need for sustainable drainage, but the ferocity and frequency of the single rainfall events that may cause flooding. These, combined with on-going development, add to the necessity for SuDS solutions.



INFILTRATION AND RUN-OFF



Naturally vegetated, rural ground is permeable and has the capacity to absorb high levels of rainfall through its surface - 'infiltration' - and to release the infiltrated water gradually into natural water courses.

Development of this ground can greatly reduce permeability by the introduction of hard surfaces -asphalt, paving concrete and the compaction caused by plant or vehicular movement. Less water infiltrates the ground and more water runs off the surface, more rapidly.

Traditionally, to avoid local flooding, surface run-off has been drained into underground pipe systems and delivered elsewhere into the water catchment area.



KEY BENEFITS

STORM WATER MANAGEMENT

High permeability and drainage capacity.



ENVIRONMENTAL MANAGEMENT

Minimises urban impact on natural water cycle.



REDUCES COSTS

As part of a Sustainable Drainage Systems (SuDS).



AVAILABLE WITH INTEGRAL COLOUR

To offer decorative and functional hard landscaping opportunities.



ELIMINATES THE NEED FOR RETENTION PONDS



SAVES SPACE

Offers potential space saving for efficient land development.



MITIGATES SURFACE POLLUTANTS



REDUCES GLARE

From wet pavement.



NO STANDING WATER

Lessens risk of hydroplaning.



PRODUCT AND APPLICATION SELECTION

WHATEVER THE CHALLENGE, WE OFFER A WIDE RANGE OF PRODUCTS FOR ALL TYPE OF PROJECTS AND APPLICATIONS.

SHARED SURFACE, MEWS COURTS, CUL-DE-SACKS AND HOME ZONES

Water Transmission layer:

- Grassgrid
- Infilta
- SuperDrain Asphalt

Water storage:

- Superflow



DRIVEWAYS

Water Transmission layer:

- Grassgrid
- Infilta
- SuperDrain Asphalt
- Hydromedia

Water storage:

- Superflow



RESIDENTIAL ESTATE AND ACCESS ROADS (MAX. 20MPH)

Water Transmission layer:

- Grassgrid
- Infilta
- SuperDrain Asphalt
- Hydromedia

Water storage:

- Superflow



RESIDENTIAL DISTRIBUTION AND COLLECTOR ROADS (MAX. 20MPH)

Water Transmission layer:

- Infilta
- SuperDrain Asphalt
- Hydromedia

Water storage:

- Superflow



REDESTRIAN AREAS AND FOOTPATHS

Water Transmission layer:

- Grassgrid
- Infilta
- SuperDrain Asphalt
- Hydromedia
- Supersport

Water storage:

- Superflow



SWALES

Water Transmission layer:

- Grassgrid

Water storage:

- Superflow



SPORT PITCHES

Water Transmission layer:

- Hydromedia
- Supersport
- Lyttag

Water storage:

- Superflow



LORRY PARKS

Water Transmission layer:

- Infilta

Water storage:

- Superflow



INDUSTRIAL ESTATE ROADS

Water Transmission layer:

- Infilta
- SuperDrain Asphalt

Water storage:

- Superflow



CAR PARKS

Water Transmission layer:

- Grassgrid
- Infilta
- SuperDrain Asphalt
- Hydromedia

Water storage:

- Superflow



ROOFS

Water Transmission layer:

- Infilta
- Hydromedia

Water storage:

- Lyttag



BASEMENT

Water Transmission layer:

- Infilta
- Hydromedia

Water storage:

- Superflow



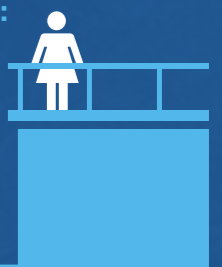
PODIUM DECKS

Water Transmission layer:

- Infilta
- Hydromedia

Water storage:

- Lyttag



ENGINEERED OR HARD LANDSCAPING

Engineered suds can be split into two different types:

- Permeable surfaces
- Impermeable surfaces with engineered source control drainage systems

THE KEY SuDS PRINCIPLES



1. Source Control

Sustainable drainage systems control surface water run-off as close to its origin as possible. This is termed 'source control'.

This minimises changes in the volume and rate of surface run-off from developed sites and thereby minimises flood risk and other environmental damage.

Additionally, SuDS may offer an element of pollution control as well as 'attenuation' – where infiltrated water is stored before its controlled release.



2. Management Train

These levels of control and treatment result from a series of techniques ('management train') that integrate with one another to gradually reduce levels of pollution, volume and flow rate prior to discharge.



3. Water Quality

Removing pollution from run-off is an important part of SuDS design.

The use of SuDS to control pollution and replace oil separators is highlighted in the most recent edition of Pollution Prevention Guideline PPG 3 published by the Environment Agency (2006).



4. Amenity And Biodiversity

Trees are an important element in the biodiversity of urban areas and improve amenity by providing enhanced aesthetics, cooling and shading.

Aggregate Industries' SuDS methods can be designed to protect and enhance the health of existing and new trees by protecting the roots systems and providing irrigation and aeration to the soil.

Key considerations summarised:



WATER QUANTITY



WATER QUALITY



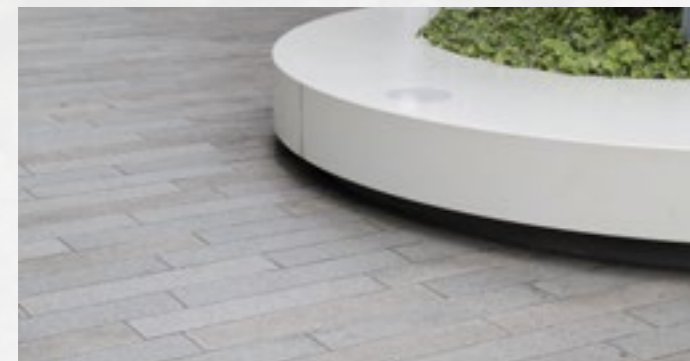
AMENITY BENEFIT

SURFACES TYPES

PERVIOUS SURFACES

Pervious surface systems include permeable or porous surfaces to car parks, roads, hardstandings and pedestrian areas. Any area covered by a hard surface can be turned into a permeable surface and incorporated into a sustainable drainage design.

Infilta block and SuperDrainasphalt are products typical of these types of systems and when incorporated into an urban SuDS development, they enhance the urban landscape. A study by HR Wallingford determined that pervious surfaces are one of the most effective and space efficient methods of incorporating SuDS into developments designed to comply with Planning Policy Guidance 3, requiring a high density of housing to be provided on new developments.



SUDS ON BROWNFIELD SITES

The first consideration for using SuDS on brownfield sites is whether ground contamination is actually present, since not all brownfield sites are contaminated.



IMPERMEABLE SURFACES

Impermeable surfaces can accommodate SuDS solutions using a proprietary system available in the market.



GREEN AND SOFT LANDSCAPING

Swales, ponds, wetlands and similar methods are classed as green/soft landscaping and many SuDS schemes involve their use. The Charcon systems provided by Aggregate Industries can be used as part of soft landscaping systems. It is bad SuDS practice to direct untreated run-off into ponds or wetlands as it will reduce their contribution to biodiversity and landscape value.

Aggregate Industries' systems can be used to provide pre-treatment to stormwater before it enters ponds or wetlands. The geocellular system can be used as an under-drain below swales to improve treatment performance and also increase storage capacity. Grassgrid can be used to provide erosion protection in swales, ponds, and other similar systems.

Even if there is contamination, the use of SuDS is still possible providing that care is taken in its design to avoid mobilising pollution into the surface or groundwater. The use of shallow SuDS such as the Aggregate Industries' systems should limit the need for the deep excavations that are commonly required with conventional drainage.



All contaminated sites are different and the level of contamination can vary from slight to high. Therefore, each site should be assessed on its own merits considering the following:

- ◆ Prevent mobilisation of contamination and its transportation to receiving waters. This means infiltration cannot be used if soils contain contaminants in a form that can be leached out. If such soils are present, then infiltration may still be used if it occurs below the base of the contaminated soils.
- ◆ Prevent the flow of contaminated groundwater into the SuDS solution. Such flow is unlikely with the shallow Aggregate Industries systems.
- ◆ Use features that minimise excavation and disposal to keep costs down. The excavation and disposal of contaminated soils is expensive, especially in the South East of England. Shallow SuDS features such as permeable pavements minimise excavations giving considerable cost savings.
- ◆ Many brownfield sites are only marginally contaminated and the contamination may be in a non-leachable form. Often, this does not pose a significant risk to groundwater when SuDS are used.

BETTER WATER MANAGEMENT FLOWS

The SuperFlow product range is Aggregate Industries' line of high performance aggregates specifically designed to provide controlled water management within SuDS. With their SuperFlow and SuperFlow Premium options, our products make any project flow easily from the very start. Plus, with constant technical monitoring and testing, it flows confidently into the future too.

The SuperFlow SuDS range is considered to be environmentally beneficial, causing minimal or no long-term damage. They are used within a succession of management practices, control structures and strategies designed to efficiently and sustainably drain surface water, while minimising pollution and managing the impact on the water quality of local water bodies.

THE SUPERFLOW PRODUCT RANGE IS A LINE OF HIGH PERFORMANCE AGGREGATES SPECIFICALLY DESIGNED TO PROVIDE CONTROLLED WATER MANAGEMENT WITHIN SUSTAINABLE URBAN DRAINAGE SYSTEMS (SUDS).

Conforms to both British European standards
BS EN13242 and BS EN12620 where applicable.

The materials are well graded, crushed angular particles allowing for optimal compaction and void retention for controlled water flow.

The aggregate strength within the Superflow range ensures the long term integrity of the SuDS system is maintained.

SUPERFLOW

PRODUCT RANGE



TYPE 3 AGGREGATE

Aggregate Type: 0/40mm Crushed Rock

Superflow Alternative: SuperFlow Sudsagg

Application: Subbase reservoir layer

Drainage Solution: Porous Sub base

Type 3 is an open graded material that meets the requirements of SHW 800 clause 805 and the grading specification set out in BS EN 13285. Type 3 has fewer fines compared to other sub-base solutions like Type 1. Type 3 is designed to allow water to drain freely.

When compared to our Superflow alternative the SuperFlow Sudsagg the Type 3 has no requirement for voids or permeability.



2/6 AGGREGATE

Aggregate Type: 2/6.3mm crushed angular rock

SuperFlow Alternative: Superflow 6

Application: Laying course aggregate

Drainage Solution: Used as a laying course
for block paving

2/6 aggregate is what is classed as 6mm single size aggregate this material is designed to BS EN standards and the grading requirements and physical properties that are required of it. This is not sold with any SuDS requirements.

4/20 AGGREGATE

Aggregate Type: 4/20mm crushed angular rock

Superflow Alternative: SuperFlow 20

Application: Bedding layer for Block paving

Drainage Solution: Sub base for use
under Block Paving

4/20 is crushed aggregate ranging in size from 4-20mm and complies to both BS EN 13242 and 12620, this means it can be used in applications that call for the use of material compiling to BS 7533 for Block paving uses.

This product is used as a bedding layer for block paving applications. 4/20 has no additional requirements besides the requirements with BS EN standards so there is no guarantee of voids or the permeability of the aggregate when compared to the Superflow alternative.

10/63 AGGREGATE

Aggregate Type: 10/63mm crushed angular rock

Superflow Alternative: Superflow 63

Application: Lower subbase layer

Drainage Solution: Lower sub base layer for use under Block Paving

10/63mm has historically been sold as part of the sustainable urban drainage system sub-bases and was originally designed as an alternative to Forterra 10-63. The specification for this material was set to follow Forterra's own grading specifications. This is sold only to meet the required grading specification and has no additional requirements that Superflow 63 would meet.



1/4 AGGREGATE

Aggregate Type: 1/4mm crushed aggregate

Superflow Alternative: Superflow Joint agg

Application: Brushing in grit

Drainage Solution: Jointing aggregate for Block paving

1/4mm crushed aggregate is designed to meet BS EN standards and ranges in size from 1-4mm and is perfect for a range of general construction uses, including Jointing aggregate.



SUPERFLOW PREMIUM

PRODUCT RANGE



CHOOSE SUPERFLOW PREMIUM PRODUCTS FOR OPTIMAL PERMEABILITY

SUPERFLOW SUDSAGG

Aggregate Type: 0 / 40mm crushed rock

Application: Sub-base reservoir layer

Drainage Solution: SuperDrainasphalt and Hydromedia

SuperFlow SuDSAgg is a well graded, reduced fines, crushed aggregate with a maximum nominal size of 40mm. SuperFlow SuDSAgg is designed to meet the structural requirements of a Foundation Class 2 material as defined in the Design Manual for Roads & Bridges, with a void content of 30% or greater to ensure optimal water management. Its structural stability means it can be used independently or as a stabilisation layer over Aggregate Industries' SuperFlow 20 when used under paver laid SuperDrainasphalt.

Working in partnership with our in-house surfacing division, Aggregate Industries can offer the complete asphalt SuDS solutions.

SUPERFLOW 20

- Aggregate Type:** 4/20mm crushed angular rock
- Application:** Upper sub-base reservoir layer
- Drainage Solution:** Hand laid SuperDrainasphalt, Infilta Block Paving and Hydromedia

SuperFlow 20 is a coarse graded aggregate produced to British European standard and works as a reservoir sub-base layer, offering controlled rain water retention within the SuDS pavement construction.

SuperFlow 20's specific grading and low degradation value results in a durable material which is easy to place and compact, while ensuring water flow is slowed and released in a more sustainable and environmentally friendly manner. The excellent physical properties and drainage characteristics of SuperFlow 20 make it an integral component to many Sustainable Drainage Systems.



SUPERFLOW 63

- Aggregate Type:** Coarse crushed angular rock
- Application:** Lower sub-base reservoir / capping layer
- Drainage Solution:** Infilta Block Paving

SuperFlow 63 is a robust starter aggregate which works as the initial lower reservoir or capping layer within the SuDS pavement construction. The product offers optimal voids due to its angular shape allowing for controlled water storage and flow, while its natural strength ensures the long term integrity of the SuDS solution is maintained.



SUPERFLOW 6

Aggregate Type: 2/6 Crushed angular stone

Application: Laying course / bedding aggregate

Drainage Solution: Infilta Block Paving

SuperFlow 6 is a high performance laying course aggregate specifically designed to provide controlled water management within Sustainable Drainage Systems (SuDS). SuperFlow 6 provides a stable flat laying surface, while retaining the optimal level of voids for consistent water flow. This carefully graded aggregate, with its natural strength and interlocking properties ensures both the long term integrity of the pavement and the excellent drainage characteristics are maintained.



SUPERFLOW JOINTAGG

Aggregate Type: Crushed stone grit

Application: Brushing in grit / Jointing sand

Drainage Solution: Infilta Block Paving

SuperFlow JointAgg is a high performance finishing aggregate specifically designed for brushing into block pavement joints. This aesthetically pleasing product offers excellent free draining characteristics due to its low fines content, while its natural strength ensures the long term integrity of the SuDS is maintained for a refined, yet functional pavement finish.



Northern Region Office	01524 738888
Midlands Region Office	01455 288222
South/South East Regional Office	0208 896 6820 opt 1
South West Regional Office	01752 485200 opt 1
Scotland Region Office	01698 870947
West Country Region Office	01373 452002

SUPERFLOW AGGREGATES