



GrassConcrete

broadcast

2020

the seeds of innovation

Grasscrete still going **strong**



In over fifty years in construction we have seen many changes as building materials and techniques have come and gone.

Since 1970 Grasscrete is the one building product that has truly stood the test of time.

Robust, Resilient, Sustainable and Environmental are just a few ways to describe Grasscrete and over the next few pages you can read why.



A ground breaking **start**

In the 1960's Yorkshire architect Jack Blackburn started his search to create a grass paving system that combined the appearance of grass with underlying strength (structural performance) and durability.

His design, which he perfected in 1970, was so ground-breaking that it remains in place today. The company Grass Concrete Ltd was formed to be first managed and later owned by Rodney Walker, a local concrete structural engineer and Grasscrete began its long history in worldwide construction.

In 1981 a UK contracting division was established for supply and lay service managed by Bob Howden who went on to undertake a management buyout of the Group in 2005. Over the years, in

addition to Grasscrete a range of environmentally themed products was also introduced into the company.

Bob Howden has overseen the international development of a unique system, but also has experienced the huge shift in attitudes to our environment. In the early days not many people were environmentally aware.

Bob explains: *"Promoting the use of re-cycled plastics in manufacturing with our void formers could be a challenge, when we came up against clauses in building contracts stating 'second hand materials shall not be used'. Fortunately, persistence pays off and our philosophies are now becoming mainstream practice."*



of fire access

Over these last 50 years Grasscrete has become the widely accepted method of constructing fire access routes and, provides both a structural and environmentally sound alternative to impermeable paving. **Grasscrete consistently meets fire and emergency requirements and has been tested under operational conditions by fire authorities.**

As is often the case when a milestone birthday is reached, out come the photos of the early years, you know the ones which show how much has changed between 'then and now'.

Here's one such photo from our archives, fire fighting with Grasscrete 1970's style. Equipment and clothing have obviously evolved, but changes in the design of access roads are less apparent, particularly if taken at face value.

The UK Building Regulations Part B still refers to what are now outmoded appliance types and applicational roles. The regulations indicate access requirement for pump appliances which weigh in at up to 13.3 tonnes for buildings up to 11 metres and a 'high reach' appliance for heights above 11 metres, these vehicles

generally having an 18 to 30 tonnes operational weight. On the face of it simple, but all of this is now challenged by changes to fleet structures within fire authorities. Many have transferred onto using Combined Aerial Rescue Platform (CARP) appliances, which enable fleet sizes to be reduced, in something of a one size fits all scenario. With this 'one size' type of vehicle weighing in at up to 22 tonnes and featuring outriggers, the simple design premise for a pump appliance is no longer sufficient and we recommend that designers of fire access routes for non-residential buildings consider future proofing to the higher specification.

It remains to be seen what changes will be made once reviews into high-rise fire safety are concluded. Will the focus remain with fighting high-rise fires from the core of the building using risers to supply water, or will consideration need also to be given to fighting flame spread through the outer shell of the building? If the emphasis does switch then there will need to be a re-assessment of means of access and escape, to cater for bigger, higher reaching fire appliances. It will also be interesting to note whether hose carrying drones become more of a feature in high-rise firefighting. What is certain is a need for building designers to consider carefully their fire and emergency access provisions.



did you know?

- Some grass paving models rely on grass anchorage for tensile strength and stability. Grasscrete does not, it's reinforced structure provides the stability and strength.
- Grasscrete offers a significant advantage during the temporary works and construction phases. Grasscrete does not require grass to have grown, it can be trafficked immediately after the concrete has sufficiently cured.



as flood protection

For 50 years providing both prevention and cure has helped to establish Grasscrete's unique credentials as a proven flood protection system

As a protector

Urban development often takes place at the expense of a naturally draining landscape with there being as a consequence, increased levels of surface water run-off from build-form and impermeable surfaces. Beneath these hardscaped areas the ground is denied the benefit of natural hydrology with a knock-on impact on soil stability, particularly in areas of shrinkable clay. With increasingly higher ambient temperatures and longer periods of drought to be found within towns and cities, hardened soils become less receptive to absorption, run-off therefore becomes more frequent and intense, leading to a greater incidence of flooding.

In 1970 Grass Concrete Limited began extolling the benefits of developing source-controlled stormwater management systems. **This predated what is now commonly referred to as Sustainable Urban Drainage Systems (SUDS).** Where however SUDS focusses solely on hydrology, Grasscrete is able to extend its reach by considering a wider greenspace eco-system. **In an urban environment, green areas lost to otherwise hard landscaping, can be significantly replicated by the introduction of a grass-paved medium.**

Grasscrete can reduce local CO₂ levels through sequestration and crucially at low level exhaust emission heights. With improving levels of evapotranspiration, there is also potential to reduce the Urban Heat Island Effect, making cities and towns better environments, with the added feel good factor of urban green space.

Solutions to hard landscaping

The benefit of a permeable paving layer in waterborne applications is now a well regarded design principle. Developed from a theory that a cellular structure could vent hydrostatic pressure from within embankments, this introduced an alternative to solid paved layers, which needed to be much thicker to resist those same pressures. With the added benefit of a natural grassed appearance, this immediately drew favour with engineers designing dams and reservoirs, offering them the scope to tone down the environmental impact of otherwise hard landscaped projects.



Benchmarking

Grasscrete became an immediate success in the construction of slopes to reservoirs and spillways, with its continuously reinforced surface offering major structural and practical benefits over alternative pre-cast types.

Grasscrete is able to evidence its impact having played its part in a number of successful interventions, which has prevented wide-scale flooding. As we face ever more demanding issues from flood risk, the need for Grasscrete has never been greater.

did you know?

In 1986 we were offered the opportunity to benchmark the levels of capability. Up until that point there had been a dearth of empirical data, as most spillways hadn't been subjected to the levels of flow for which they had been designed.

In 1986 the CIRIA Trials took place, which led to the publication of Report 116 The Design of Reinforced Grass Waterways. This publication became the standard reference work for design and helped to cement Grasscrete's status at the highest level.

The CIRIA Trial was timely as the need for flood defence measures accelerated. Grasscrete has played a significant role in the construction of flood storage areas as a vital spillway component, enabling overspill to be temporarily released into storage areas during peak demand.

Carbon costing with Grasscrete

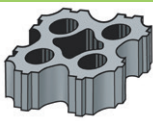
During a recent discussion, we were asked about the relative carbon cost of shipping Grasscrete around the World. This stirred us into carrying about a simple comparative analysis with an alternative supply using pre-cast blocks. Immediately our thoughts turned to a project supplied some years ago to the Rufiji River in Tanzania.

HOW WE COMPARE - Grasscrete supplied by sea and road from our hub in China v Pre-cast blocks supplied by road from Johannesburg

GRASSCRETE INSTALLATION

	2 Sea containers	Grasscrete void formers delivered from China Hub		5600 miles each way	22,400 miles	TOTAL 24,800 miles
	60 Concrete mixers	Local ready mix concrete delivered to site		20 miles each way	2,400 miles	

PRECAST INSTALLATION

	29 HGV deliveries	Johannesburg to Tanzania		2,150 miles each way	TOTAL 124,816 miles
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Did you know?

Grasscrete handles one of the heaviest vehicles ever to appear on UK roads. One of our projects at a sub-station in Penwortham Lancashire required 275 tonnes of electrical generating equipment with an overall vehicle load of up to 500 tonnes.

This proved to be too heavy for UK bridges and we had to carefully plan a route. A specialist barge was used to transport the load by sea and then to a berth on the River Ribble. From there it travelled one mile to the site where the access road had been constructed in Grasscrete.

Even before the grass had time to grow, Grasscrete proved its heavy weight credentials to handle the heaviest loads.



Sporting life

The Management Team at Grass Concrete Limited has always held close links with sport and the company has often backed this up with sponsorships and partnering.

The sporting successes of Grasscrete's team players all began with our first Managing Director Rodney Walker, who had been a young Loose Forward at Wakefield Trinity Rugby League Club. Grasscrete were an early shirt sponsor of the club.

Once his playing days were over Rodney maintained his sporting connections by Chairing at various times, the Rugby Football League, Leicester City Football Club, World Snooker, Wembley Stadium and UK Sport, from where he was knighted for his services to sport. Sir Rodney also held historic links with Wakefield Harriers athletics club, who still promote the Grasscrete Trophy meeting.

Much of Grasscrete's early success can be attributed to the drive of its Sales Director the late Brian Fearnley. Brian was a League cricketer with Hundhill Hall Cricket Club and the company's patronage extended to sponsoring the League's Grasscrete Trophy.

Bob Howden, our current Group MD, was a successful road-racing cyclist. After 25 years of competition he moved into officiating and since 2005 has organised the Ryedale Grand Prix a major event in North Yorkshire, which on three occasions has doubled as the British National Championship. Grass Concrete Limited has sponsored each race and it is now known as the Grasscrete Ryedale Grand Prix

A Director of British Cycling from 1999 to 2017, its Chair from 2013 to 2017, Bob is now its President and has been awarded an OBE for services to cycling.

Grass Concrete Limited is happy to champion sports and proud to give support through sponsorship.

Grass Concrete Limited numbers

8 Metres per
second flow rate
for Grasscrete
GC2

40 Tonnes,
the maximum
weight of a 5 axle
vehicle on
UK roads

39 Years of UK
Contracting and
looking forward
to the next big
birthday



28
The number of
our International
Licensees
covering 76
countries

119 Countries
in the Rest of the
World – we can
probably get to
most of
them!

15 Years of
sponsoring the
Ryedale Grand
Prix Cycle Race

Pooh Sticks

In our brochures and design guides, there's reference to a flow rate of up to 8 metres per second for our Grasscrete GC2 system, **what does that mean and what does it look like?**

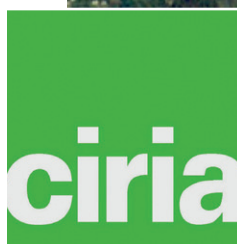
Well if you read the Winnie the Pooh, stories by A A Milne you may have heard of Pooh Sticks. This being a game where sticks are dropped from a bridge into flowing water. The winner of this game was the person whose stick was the first to reach a point down-stream. Imagine therefore, dropping a stick into water and at the click of your fingers the stick has moved the length of say, a London bus, that would be 8 metres in just one second!

Up until 1986, there had been no data to benchmark the ability of reinforced grass paving to accept water flow. That all changed with a test in the North West of England under the control of the Construction Industry Research and Information Association (CIRIA).

The de-commissioned Jackhouse Reservoir was used as a trial bed. Twelve different methods of grass reinforcement were tested via trapezoidal channels excavated from top to bottom off the reservoir slopes. Each channel was lined with a product type and, after grass establishment was subjected to calibrated water flow.

The flow limit available to the test was 8 metres per second and it was intended to test the systems up to destruction. System failures began at 2 metres per second, but at the end of the test the Grasscrete channel was structurally un-damaged.

Such flows are to be found in tropical storm channels and to spillways for reservoirs and flood control embankments. We don't suggest for one minute that engineers take up Pooh sticks as a design tool but the CIRIA Report 116 is certainly worth a read.



Unusual projects

In the name of art

Creating a showstopper for Hampton Court Flower Show in London may be the sort of project well suited to Grasscrete's green and urban landscaping credentials. However when the centrepiece features an old Bentley car being suspended vertically it becomes quite a challenge.

The exhibit's designer had the vision of a gas-guzzling car taking a nosedive to earth and morphing into upscaled hanging basket. An example of early climate change opposition perhaps.



The Bentley had its chassis bolted to a vertical support. Below the car was a pond surrounded by Grasscrete paving. The intention was to show how a mundane pavement could be transformed into a living world – a perfect application of Grasscrete.

To emphasise the point the concrete structure of the Grasscrete was cast using a dark grey concrete. It certainly drew attention from the thousands of visitors to the annual show.

What a waste!

Not all of our Grasscrete projects are as glamorous to see as the Hampton Court Flower Show. Some projects we can't reveal for security reasons and some such as sewage or waste water sites are perhaps best not placed on show to the public.

It's the topic of sewage however, which draws us to an anecdote from the late 1980's. Back then there was a practise in the London area of aggregate suppliers blending demolition dust with dried sewage cake, to then sell the result as an 'improved' topsoil. On one particular project where this material was inadvertently used, we were surprised to learn that rather than having grass growth, a Grasscrete road had developed a healthy covering of tomato plants. Of course, we remedied the problem but only after the client had delayed the remedy until the crop had been harvested.



What comes after 50?40 of course!



ChantryContractors

Limited. Following its beginnings as a groundworks contractor, the company progressed into the dedicated supply and lay service for Grasscrete, Grassblock and later Grassroad paving alongside our Betoconcept earth retaining walls.

Now, after many hundreds of installations Chantry has built an impressive portfolio of project applications. This has helped to develop knowledge and to implement further product and construction updates – the install experts for 40 years.

No we aren't that bad at maths, but we do have another milestone in our sights.

2021 will see the 40th anniversary of our UK Contracts Company Chantry Contractors



Were there barriers to developing the system?

Not barriers as such, it was more a case that Grasscrete was ahead of its time, with its environmental benefits, which weren't fully appreciated in 1970. This tended to mark the system as being niche.



How is the market for Grasscrete now?

It's probably fair to say that we are now very much 'in our time'. As environmental awareness has grown so has the perception of Grasscrete's credentials and its relevance.



Grasscrete puts Metrolink **Right on Track**

We love working with engineers and architects in the early stages of a project. One great example is Manchester's Metrolink in England.

Earlier phases of the city's light rail scheme had seen the surrounds to the rail lines feature the pavement types found in the locality, such as cobbles.

For our phase, which was to pass through Salford Quays, an area of smart regeneration, which is now the site of MediaCityUK, the project designers were looking to enhance the development with greenspace. A grassed solution was sought to sit between and alongside the tramlines.



For a successful specification a number of challenges needed to be met.

- The growing medium for the grassed paving needed to be contained, so as not to contaminate the track and adversely influence the earthing
- The paving edge was required to consistently follow the rails with a fixed gap between the two
- The prospect of vandalism was a concern and it was thought that pre-cast blocks could be removed and set on the line potentially causing derailment
- With the rails sat on an underlying solid concrete slab there would need to be a drainage system introduced to migrate water as it passed through the grassed paving, wicking it away to the collector drains at the edges of the track
- When completed the paving must be capable of handling maintenance vehicles working on the lines and overhead cables. These vehicles might be of road railor or normal road going construction
- The surface should be sufficiently rigid, so as to maintain a consistent gap to the underside of the tram, to avoid the potential for underrun

All of these issues were tackled within the existing generic Grasscrete system, however the construction and drainage alternatives were bespoke.

Today the Metrolink project is a fine example of collaboration at its best.

A change of identity

Grass
Concrete
Limited



grasscrete



GrassConcrete



Grass Concrete Limited

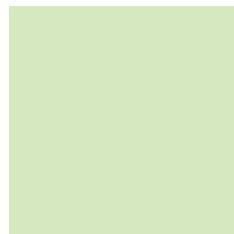
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A full range of brochures and technical guides are available upon request



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