SUSTAINABLE PAVING SYSTEMS, LLC

Grasscrete®

General Process & Applications

Single-Use Formers

This document describes the two single-use tools utilized to create the Grasscrete product. The original Single-Use Former is a vacuum formed light gauge plastic mold while the newly developed and patent pending Molded Pulp Former is made from waste paper pulp.

The formers are comparable in terms of concrete consumption, load bearing capacity and percentage of void structure. The Molded Pulp Former however is made from 100% recycled product and is bio-degradable. It disintegrates with pressurized water and is easier to install than its plastic predecessor.

In many cases the information in this document as to how the Grasscrete product is installed, the types of applications for Grasscrete and the history of Grasscrete installations will include references and pictures of both the Plastic and Molded Pulp Formers.

Plastic Single-Use Former

Molded Pulp Former

Grasscrete is essentially a series of voids in structurally reinforced concrete slabs that allow water to pass through into the sub-base. The Formers are first laid over a compacted granular sub-base with wire mesh or rebar placed over the Formers. Fluid concrete is placed over the Formers and struck off to the tops of the Formers with squeegees by applicators working off bridging to avoid crushing the Formers. The Former Tops are then removed or punched down mechanically after the concrete has hardened leaving the desired voids.

For exposed applications such as parking lots, the concrete is poured at a less fluid consistency. The final surface is struck off or screeded in a fashion comparable to a regular concrete slab pour. The concrete is cast slightly higher than the former tops to allow for a clean void to be opened either later the same day or early the next dependant upon conditions. The final surface is broom finished or in specialized installations the fine or coarse aggregates may be exposed.

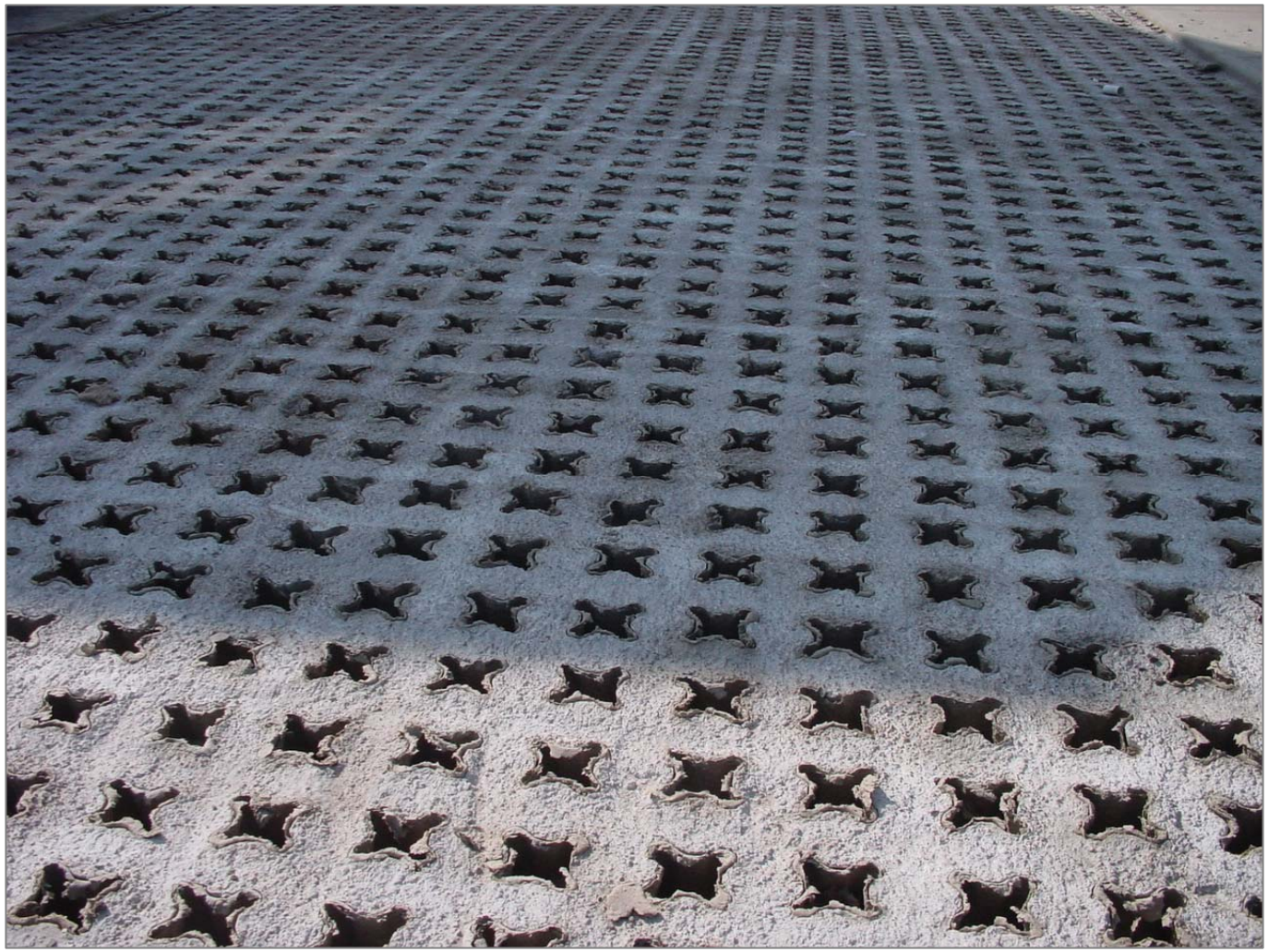
Molded Pulp Former

Placing Concrete

Concrete Struck to Former Tops

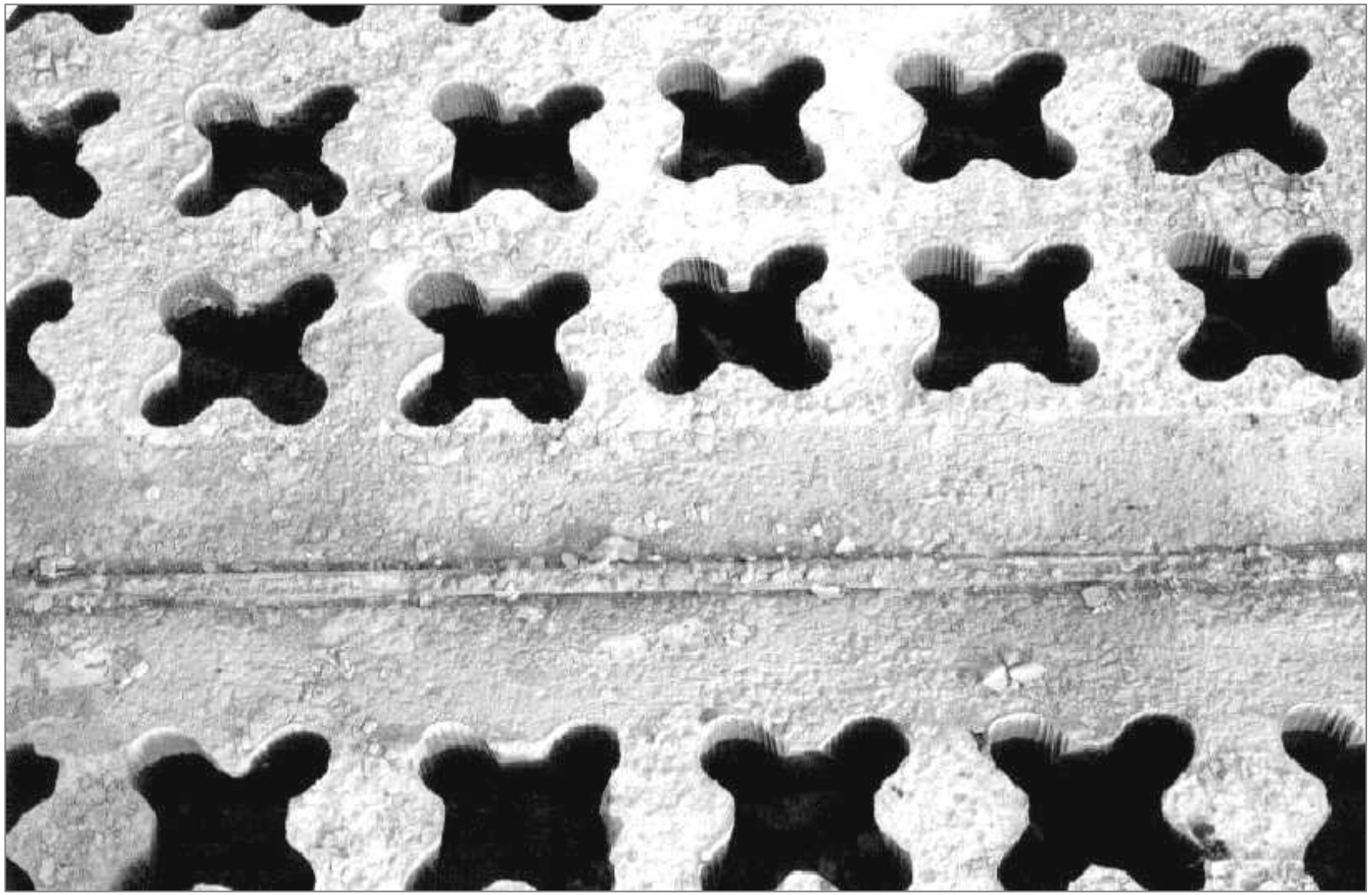
Removing Former Tops

Formers Opened for Fill



Storm water capacity below the Grasscrete installation can be achieved through the use of clear granular aggregates such as this reclaimed concrete. Additional capacity can be achieved through the use of storm water harvesters or reservoirs which are approved for use with the Grasscrete system.

Expansion Joint



Once the Concrete has hardened to the point where it can bear the weight of equipment, soil or sand or a combination of both is worked into the concrete voids. Additional soil is spread over the surface 1”-2” thick then seeded or sod is applied.

For exposed applications the voids are either vegetated or a stone fill is employed.

One distinct advantage that Molded Pulp Formers have is that they can be easily cut to conform to irregular shapes to best conform to the formwork.

The Grasscrete Molded Pulp Former comes in a 5 1/2” thick system that utilizes #2, #3 or #4 bar dependant upon application. The compressive value of the concrete can also be increased from the typical 4000 PSI for heavier applications. All exposed applications utilize fiber reinforcement in the concrete mix to minimize random cracking potential.

A concrete curb or border is typically cast at the perimeters of the pour reinforced with a single #3 bar. This curb can be poured at the finished grass height and used to distinguish the perimeter of the Grasscrete installation for emergency access installations.

This is an example of a typical Exposed Grasscrete Single-Use Former installation with a perimeter band of concrete displayed between pours. The Single-Use Formers are intended for Grasscrete installations required as emergency access or periodic access such as window washing equipment or maintenance vehicles as well as fully trafficked parking installations with the voids grassed only such as shown below.

This is an example of a Single-Use Former Grasscrete installation intended for regularly trafficked use such as parking or as a driveway. The grass was planted low in the voids allowing for the vehicle tires to travel on the concrete without compacting the root zone or damaging the grass. This technique is referred to as partially grassed and is a very robust system that allows for the use of grass with the durability of concrete.

This is an example of a Single-Use Former void grassed installation intended for regularly trafficked use both low and higher speeds. This system allows the use of pervious shoulders on major thorough ways to afford vehicles in distress or emergency vehicles the ability to pull off the main roadway.

This is an example of a Single-Use Former installation intended for use as temporary parking. The installation was fully grassed but due to a change of use the root zone over the concrete has been compacted and the grass is only growing in areas above the voids. The use of a partially grassed system would have been more appropriate.

Some installations use graded crush stone to fill the voids rather than soil or sand. The capabilities of Single-Use Former's for exposed projects such as pictured below is superior due to the consistent elevations that can be achieved. The surface can be easily trafficked by foot or vehicle and is completely pervious in nature.

Open void installations such as pictured below work well for functional applications where maximum capacity is required for flat expanses with no drainage system.

The Grasscrete product functions well in all environments provided that the correct varieties of grass are utilized. It is recommended that in dry environments a robust grass with good drought tolerance is utilized along with a moisture retaining additive in the sand or soil. Periodic to regular irrigation is required dependant upon conditions.

Broomfield, Colorado

The Grasscrete Single-Use Former product pre-dates the Re-Usable Former product which has been in use in the United States for over 20 years. There has been substantial testing done with various regulatory bodies to approve the product for emergency access. The product has proven out to be the most robust on the market with no settling issues associated with pre-cast or plastic unit materials or rutting from vehicle use. The structural properties of Grasscrete is not dependant upon the grass roots or other binders/stabilizers.

1982 Testing

2008 Testing

The Grasscrete Single-Use Former product has been thoroughly tested (see one example of an on site test below) for use in areas with substantial storm water runoff or seasonal water runoff. The continuously reinforced Grasscrete has proven to be the most robust on the market with no wash out issues associated with other systems that rely on grass roots or other binders/stabilizers.

The Grasscrete Single-Use Former product can be installed on a slope adequate for slope protection or river embankments. Being structural and continuously reinforced, it allows for vehicle access to the water or over the system with out issues such as rutting that would cause bank destabilization with other products.

The Grasscrete Single-Use Former product has a substantial international track record for use as a river training product such as this project in Tai Po, Hong Kong. The original pre-cast unit system was replaced with the cast-in-place Grasscrete product.

The Grasscrete Single-Use Former product can be utilized for retention areas or storage ponds. It allows the water to percolate through the system, retaining the silt or sediment which can be removed periodically with the use of heavy equipment such as front end loaders. This installation is under construction prior to grass.

Grasscrete has many custom applications such as this light rail project. Utilizing the concrete system allowed for the use of conventional maintenance vehicles rather than those requiring specialized equipment to travel the tracks and disrupting the train traffic.

Grasscrete®

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