



ModieSlab is a consortium of Betonson, Heijmans and Arcadis

Modulair – Intelligent – Energetic – Slab

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ModieSlab 

ModieSlab



A Revolutionary new road surface



ModieSlab

A fast, sustainable and intelligent concept

ModieSlab is a revolutionary new road surface. Sustainability, speed, comfort for drivers using this road surface and easy availability are characteristics, which help to distinguish ModieSlab from other road constructions. The system consists of concrete elements, which are constructed from two different open layers of concrete on a supporting layer of concrete. Water run-off channels help rainwater to be quickly discharged. Furthermore, these channels also give the road surface self-cleaning properties.

ModieSlab also offers opportunities for smart features like detection and signalling. An optional piping system in the construction layer keeps the road surface cool in the summer and warm in the winter. Thus, the surface itself actually manages to remove a lot of snow and ice, which helps to prevent damage to the road surface caused by salting. ModieSlab is characterised by high noise reduction, circa 6dB(A), and low rolling resistance which results in considerably lower emissions of CO₂, NO_x and fine particles.

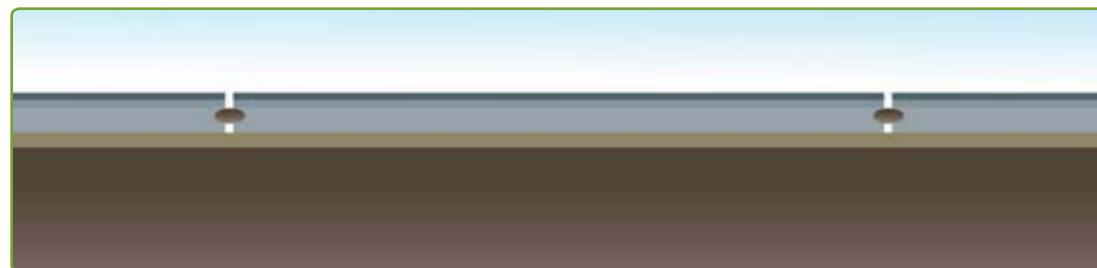
In areas and regions with subsidence issues, ModieSlab excels by offering many water passages and underground structures. The ability to meet requirements for heavy traffic, noise reduction and life span make this system the ideal road construction for these challenging applications.

As well as designs with road surfaces on poles, research shows that ModieSlab founded on steel is very practical when used on stable ground structures.

ModieSlab founded on poles



ModieSlab laid on steel with innovative anchoring



ModieSlab winner of Roads to the Future

In 2000 ModieSlab was introduced into the innovation programme 'Roads to the Future' established by Public Works and Water Management. ModieSlab v.o.f. presented the ModieSlab concept; a pre-fabricated concrete slab on a support construction. This revolutionary development was one of the prize-winning ideas. The jury report stated: 'Great casco-system, extensive features, suitable for areas with subsidence issues (on poles)'.

Piling ModieSlab Oudenrijn



ModieSlab in practice

In 2001, a ModieSlab test lane was placed at De Somp on the A50 near Apeldoorn. A year later the Technical University of Delft evaluated a test strip at their site using the Lintrack heavy traffic simulator. In both cases, the results of the tests surpassed the set requirements.

In 2006, testing took place at the Oudenrijn interchange. On the southern bypass of the A12 near Utrecht, a 100-metre long 'up-scaling' test lane was laid. This involved a full-scale motorway set-up of the concept and provided an evaluation in intensive traffic conditions.

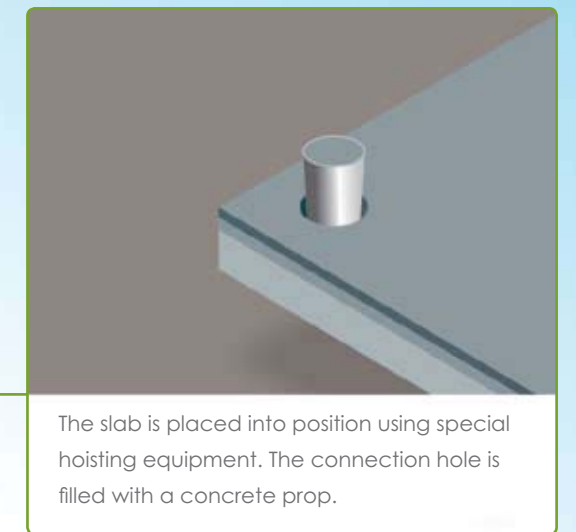
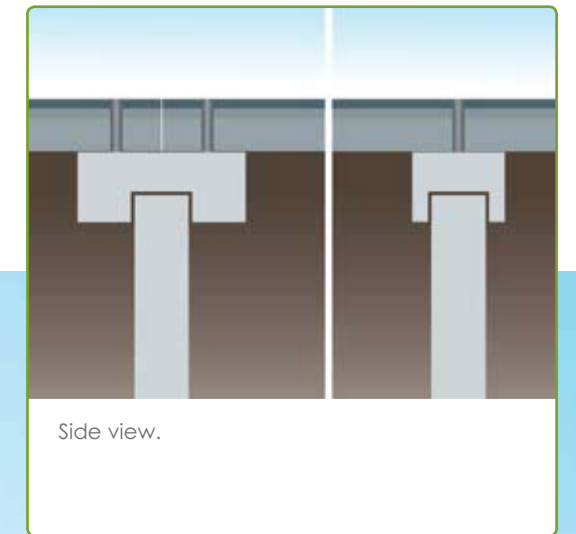
Testing in Oudenrijn confirmed effective shape-retention, high noise reduction and increased comfort for drivers using this road surface due to the smooth road surface and extremely fast run-off of rain water.

Lane construction

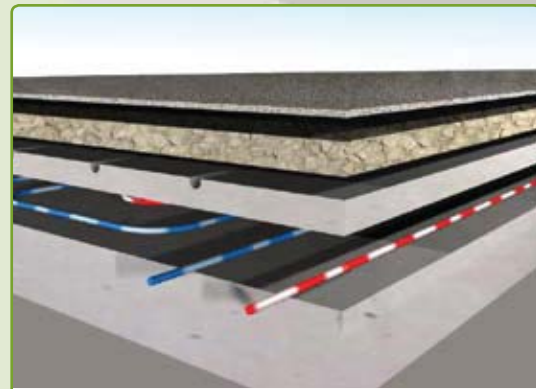
an example of a modular, piled road

1. In unstable under surfaces, poles are applied in every corner and in the centre of the slab.
2. Concrete support elements are then laid on the poles.

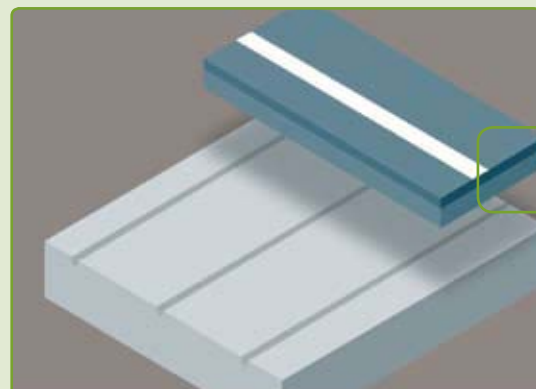
3. A crane places pre-fabricated road slabs on the support elements.
4. After a slab has been laid and configured, all slabs are connected to the support elements underneath.



If the road surface is severely damaged, the slab (or slabs) in question can be easily replaced.



An optional system for road surface cooling and heating.



Water run-off channels help to quickly discharge rain water and create a self-cleaning effect.



The top layer consists of two types of open concrete. The grain composition and layer thickness are configured to achieve the best possible noise absorption, sufficient shape retention and very fast water discharge.

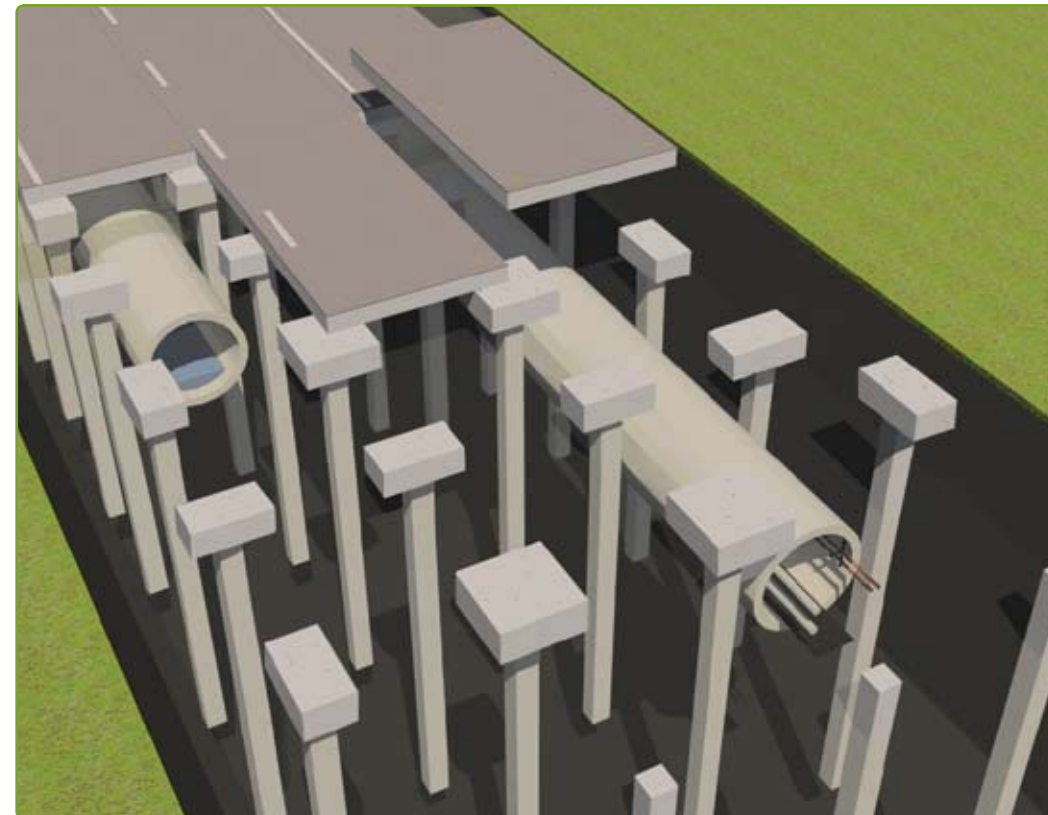
Sustainability, availability, comfort

Comfort for drivers using the road surface and sustainability go hand in hand at ModieSlab. In our factory optimum use is made of properties like smoothness and texture of the concrete slab surface. The result of this process is a road surface with a lower rolling resistance than traditional road surfaces. This lower rolling resistance is expected to lead to lower emissions of CO₂, NO_x and fine particles. Tests have already shown that ModieSlab helps to significantly reduce tyre wear. Less wear on rubber tyres results in lower emissions of fine particles.

In addition to excellent road surface properties such as faster rain-water run-off (much quicker than 'silent' asphalt), skid resistance, shape retention, noise reduction and subsidence resistance, ModieSlab also delivers other major advantages for road users and the economy in terms of availability.

ModieSlab is also quick to lay and requires less maintenance. A road surface on poles is able to resist uneven foundations. This means new applications are quicker to place in areas with subsidence issues compared to traditional constructions, which require pre-compression. Furthermore, a damaged slab can be quickly and easily replaced. Traffic is able to drive on the new road surface immediately after it has been laid without being hindered by the performed activities.

An example of a combination of ModieSlab and a cable and pipe casing



Availability

- Fast placement
- Less maintenance
- Quick repairs
- Placement and maintenance not season-dependent; emergency repairs always possible.

Sustainability

- Long life-span
- Low rolling resistance, which results in lower fuel use. This directly reduces the emission of CO₂, NO_x and fine particles.
- Less tyre wear due to low rolling resistance, resulting in lower emissions of fine particles.
- Open concrete layers can operate as buffers against fine particles
- Optional system for cables and pipes (see illustration)
- Optional system for road surface cooling and heating helps to combat vehicles skidding on the road and road surface deformation.
- Smaller work surface needed because assembly is possible on top of 'own work'
- Fewer transport journeys needed for assembly compared to traditional road constructions

Comfort and traffic safety

- No foundations
- Extremely smooth road surface
- Good skid resistance
- Shape retention – no track forming
- Water permeable – no aquaplaning
- Self-cleaning capability
- High reduction to only circa 6 dB(A)
- Implementation of smart features

Long life-span

The expected life-span of ModieSlab is considerably higher than that of traditional road constructions. The steel support construction is designed for a life-span of 50 years, while the support structure on poles delivers a 100-year life-span. The expected life span for the top layer is at least 15 to 30 years. Furthermore, considering the low maintenance, ModieSlab provides availability, which is many times greater than traditional road constructions. In case of damage (which is expected to be rare), slabs can be quickly repaired.

Other applications and extra options

ModieSlab is suitable for all roads but, due to the many water passages and the underground infrastructure, best proves its many qualities in areas with subsidence issues. The ability to meet requirements for heavy traffic, noise reduction and long life span makes this system the ideal road construction for these challenging settings. The concept is also perfect for raised roads, for terminal and run-way surfaces and tram/bus lanes.

ModieSlab also offers an extensive range of additional possibilities, such as the incorporation of signposts and fixtures for gateways and tram rails into the road surface. Various features can also be implemented underneath the slab such as systems for cables, pipes or liquids. Another option is the placement of a piping system in the construction layer, which cools the road surface in the summer and warms it in the winter. This helps to remove snow and ice from the surface, thus preventing damage to the road surface caused by salting. Integrated spraying systems and skid warning systems can also be incorporated into this road construction system.

Montage ModieSlab Oudenrijn

