

## Internship Details:

**Duration:** 11 weeks

**Organization:** NETICS, Website: [www.netics.nl](http://www.netics.nl) .

**Location:** NETICS BV and University of Twente (UT)

**Supervisors:** Marc Antoun, NETICS: [marc@netics.nl](mailto:marc@netics.nl), Dr. Tanmaya Mishra, UT: [t.mishra@utwente.nl](mailto:t.mishra@utwente.nl)

**Benefits:** Paid internship

**Topics:** Compressed Stabilized Earth Blocks

## Introduction to Compressed Stabilized Earth Blocks (CSEB):

Compressed Stabilized Earth Blocks (CSEB) are an environmentally friendly alternative to conventional construction materials, offering a sustainable solution for building infrastructure. CSEBs are typically made by compressing a mixture of locally sourced soil, stabilizers such as cement or lime, and water into solid blocks. These blocks possess remarkable thermal properties, low carbon footprint, and contribute significantly to sustainable development initiatives globally.

## Internship Objectives:

During this internship, the selected student will delve into several key aspects of CSEB performance, focusing on the following questions:

### *Effect of Friction on CSEBs, Particularly in Pavement Stones:*

- How does friction impact the durability and longevity of CSEBs, especially when utilized as pavement stones?
- What are the factors influencing friction between CSEBs and the underlying surface?
- What strategies can be employed to enhance frictional properties, ensuring optimal performance in various applications?

### *Effect of Wet Strength versus Dry Strength:*

- What are the differences in mechanical properties between wet and dry CSEBs?
- How does moisture content affect the structural integrity and load-bearing capacity of CSEBs?
- What methodologies can be employed to measure and optimize wet and dry strength characteristics?

### *Optimization of CSEB Performance:*

- How can we optimize the overall performance of CSEBs, considering factors such as compressive strength, water resistance, and durability?
- What role do additives or alternative stabilizers play in enhancing CSEB properties?
- Are there innovative manufacturing techniques or design modifications that could improve CSEB performance while maintaining sustainability?

## About NETICS:

NETICS is the expert when it comes to stabilizing and reusing dredged sediments and holds the expertise and unique knowledge to dewater and strengthen (dredged) sediment. NETICS has gained much experience and worldwide recognition with its technology. Applying reuse technologies brings great advantages to projects since they can easily be combined with work already performed. Owners of soft sediment become builders of structures and start earning money with their 'waste'. This gives new business models and opportunities for governments, project developers, contractors, and users.

As Sediment Engineers, we are very proud that we have the opportunity to use our extensive knowledge about (soft) sediments for the development of innovative technologies for the beneficial reuse of these sediments. We are continuously searching for new methods to stabilize soft sediments and transform it into useful building materials. Especially methods based on a Building with and Inspired by Nature theme, which can be deployed for new climate-adaptive, sustainable, and affordable structures.

As a result of the increasing flood risks and rapidly increasing urbanization, the worldwide need for low-cost building materials increases every day. Deltas all over the world contain sufficient material to build all necessary dykes, dams, and flood barriers for the future. The material can also be used for land reclamation and even to build houses.

NETICS owns a patent for making building blocks made out of soft sediments, the so-called GEOWALL®. The GEOWALL® includes the process of the stabilization of soft sediment using biological, chemical, physical, and mechanical stabilization. The GEOWALL® has turned out to be a sustainable and cost-saving alternative to concrete elements. Due to the GEOWALL®-technology among others, every year, since its establishment, NETICS has ranked highly in the top 100 most innovative SME companies in The Netherlands.