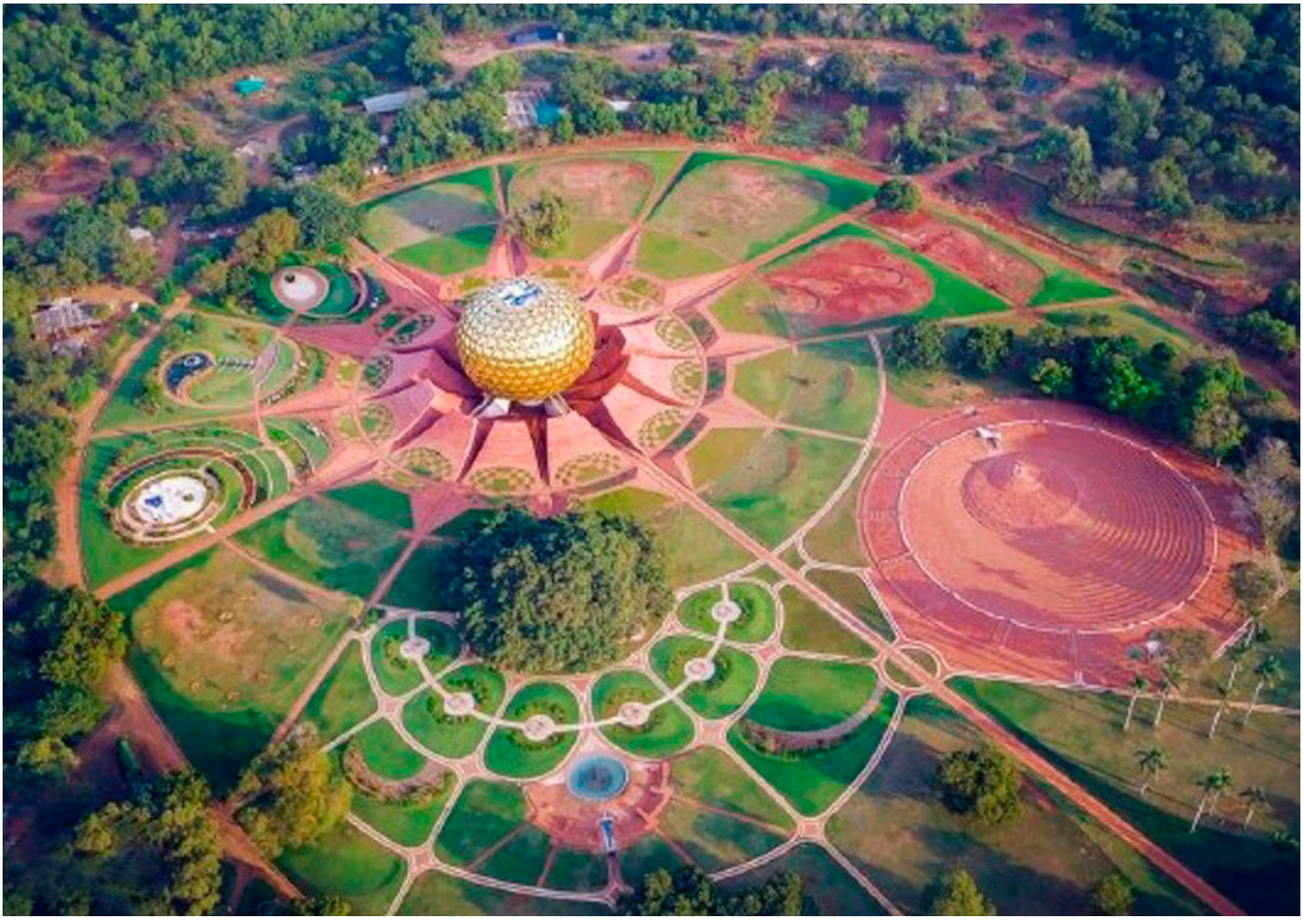
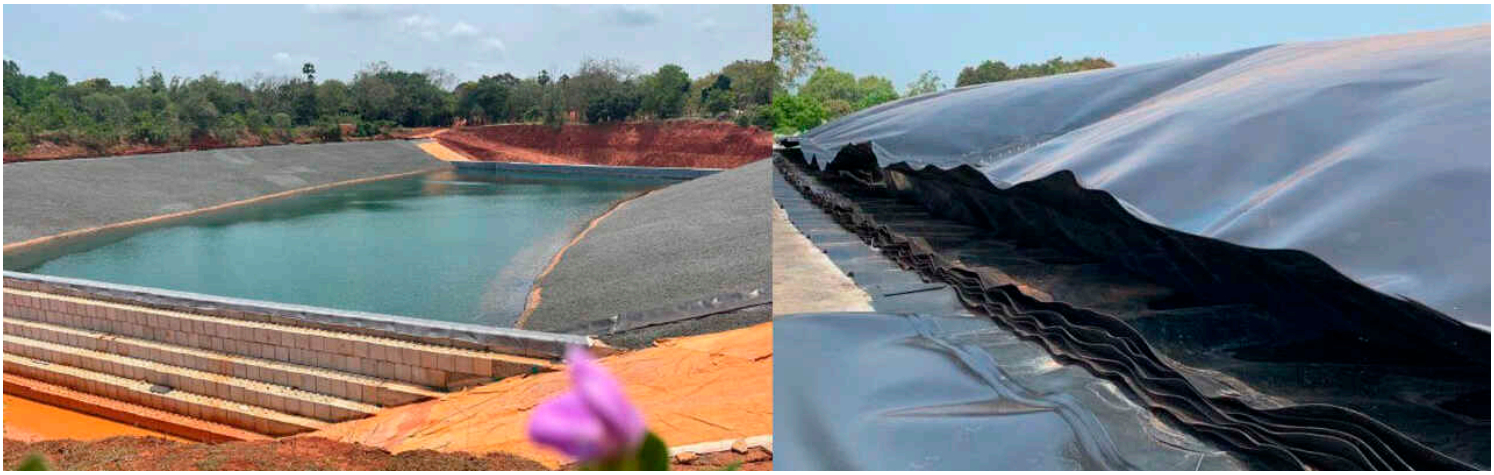
# Rainwater Harvesting Water Sustainability Project

## Base sealing system

- **Project name**
  Matrimandir Lake, Auroville, India
- **Designer/Consultant**
  LGA, Nuremberg, Germany
- **Products**
  Secutex® R 401
  Secutex® R 1201
  Carbofol® HDPE 406 2,0 s/s
  Carbofol® HDPE 406 2,0 BF/TF GM13





Auroville, an international township located in Tamil Nadu, India, was established in 1968 with the support of the Indian government, UNESCO, and 124 other countries. Its vision is to foster research for a better society, with numerous projects focusing on sustainable urban and rural water management. At its heart lies the Matrimandir, surrounded by twelve petal-like structures and gardens, forming an area called "Peace," which will eventually be encircled by a lake.

## The vision for the Matrimandir Lake

The creation of this lake is rooted in Auroville's commitment to developing an innovative water management system that benefits the entire surrounding region. Given the monsoonal nature of rainfall in Tamil Nadu, where 90% of annual precipitation occurs in just two months, water storage is a crucial challenge. The rapid population growth in the area and increased agricultural activities have further intensified the need for efficient water management.

## Building the first of Its kind in India

The Matrimandir Lake is designed to meet this challenge. With a surface area of 170,000 square meters and a depth of 10 meters, this artificial lake will be the first of its kind in India. It is being built to store one billion litres of rainwater over ten months, ensuring water availability throughout the year. The lake's construction relies on advanced technology, primarily Naue Carbofol® HDPE (high-density polyethylene) geomembranes, imported from Germany due to its exceptional durability and effectiveness in preventing water seepage. HDPE is considered ideal for such applications, with a projected lifespan of 100 years.

## Innovative engineering and design

The lake's shores are carefully designed with a 1:3 slope, reinforced with large concrete blocks. The slopes must be meticulously smoothed and compacted before the HDPE waterproofing layer is installed. Once installed, the geomembrane ensures zero water loss. The geomembrane's installation is a critical process, immediately following the fine grading of the slopes to prevent damage from rain.

## Revolutionary underwater storage technology

A significant feature of the lake is the innovative use of underwater fluid storage cushions made from Carbofol®. These cushions are designed to store up to one million litres of drinking water and can be filled or emptied as needed. A second cushion with half the capacity of the first is also under development. These cushions, separated from the lake's main water body, demonstrate flexibility and efficiency in water storage. They also offer potential applications beyond Auroville, such as freshwater storage for desalination plants.

The lake's construction involves layering a nonwoven under and over the HDPE geomembrane, topped by a 30-centimeter layer of granite chips for added protection. The meticulous engineering of the lakebed was based on extensive soil stability and friction tests. The rainwater harvesting channel feeding the lake is also waterproofed with HDPE and connects to the lake via two pipes.

## A new standard for urban water management

Overall, the Matrimandir Lake project is a significant leap forward in urban water management for India. Its scale, technical sophistication, and innovative use of Carbofol® geomembranes set a new standard for sustainable water management, perfectly tailored to meet local environmental needs while integrating state-of-the-art global engineering practices.

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