

# Case Study

## Stabilising access roads with STASOIL® technology

### Client Project

The STASOIL® technology was applied to stabilise the access road to their CPF Hamaca drilling field at CPE6.

### The Challenge

To stabilise the access road to the drilling field while:

- **Reducing Costs:** Minimise expenses by utilising native soil and reducing material transportation.
- **Ensuring Operational Efficiency:** Facilitate the safe and efficient transport of crude oil trucks.
- **Minimising Environmental Impact:** Confine waste within the road structure and reduce resource consumption.
- **Managing Environmental Liabilities:** Ensure compliance with environmental regulations and prevent potential contamination.

### The Solution: STASOIL® Technology

To address these challenges, a novel approach utilising Colloidal Delivery System (CDS®) technology was implemented. This innovative solution offered:

- **In-Situ Stabilisation:** By leveraging native soil, the need for transporting materials from external sources is significantly reduced, saving both time and cost.
- **Resource Efficiency:** The process requires less cement and water, contributing to reduced resource consumption.
- **Environmental Protection:** STASOIL® technology enables the nano-confinement of environmental liabilities and waste within the road structure, minimising their impact on the surrounding environment.

## Client Quality Assurance

### Environmental Impact

The waste management strategy employed in this project ensured that waste materials were fully contained within the road structure, minimising their environmental impact. This approach met both functional requirements for heavy-duty traffic and environmental regulations.

### Technical Performance

- 1. Material Efficiency:** The minimal use of cement in the test indicated the potential for further optimisation and potential elimination of this component in future applications.
- 2. Structural Integrity:** The constructed slab successfully met the soil stabilisation requirements, as validated by bearing capacity tests and environmental assessments. The project achieved its objectives without any occupational, environmental, or social incidents.
- 3. Water Resistance:** Laboratory tests showed that the road surface exhibited water-repellent properties, reducing the risk of leaching and enhancing the long-term stability of the structure.
- 4. Durability:** The road demonstrated excellent durability, maintaining its integrity even under excess water conditions.
- 5. Dust Reduction:** The strong bond between the aggregate and the matrix significantly reduced dust generation. To further minimise dust, a 2-5 cm wearing course with the colloidal system was recommended.
- 6. Environmental Compliance:** The results of TCLP leachate tests and the absence of iridescence demonstrated compliance with environmental regulations. The levels of heavy metals and petroleum hydrocarbons were significantly below regulatory limits, highlighting the superior performance of the STASOIL® technology compared to other available methods.

## Key Findings and Results

### Construction Efficiency:

- The construction process was streamlined, reducing the number of stages from three to one.
- The technology demonstrated its ability to handle challenging waste materials, including high-viscosity liquid sludge, without compromising performance.

### Performance and Durability:

- The stabilised road exhibited exceptional durability, showing no signs of cracking or structural failure, even under heavy traffic and adverse weather conditions.
- The road demonstrated excellent resistance to water erosion, ensuring long-term stability.
- The strong bond between the aggregate and the matrix minimised dust generation and enhanced overall road performance.

### Load-Bearing Capacity:

- The road demonstrated high compressive strength, capable of withstanding heavy vehicle traffic and heavy lifting operations.
- The California Bearing Ratio (CBR) tests confirmed the road's stability in both saturated and unsaturated conditions.

### Environmental Impact:

- The technology effectively confined waste within the road structure, preventing leaching and protecting the environment.
- The absence of heavy metal leaching and iridescence confirmed the technology's environmental soundness.

## Conclusion

Our client's successful implementation of STASOIL® technology highlighted the transformative potential of this innovative solution. By addressing the challenges of traditional road construction, STASOIL® offers a sustainable, cost-effective, and environmentally-friendly approach to building durable and resilient infrastructure.

**To learn more**

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