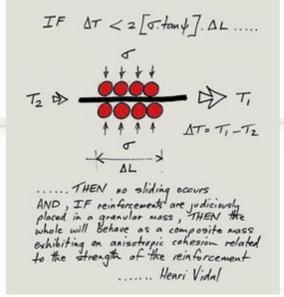
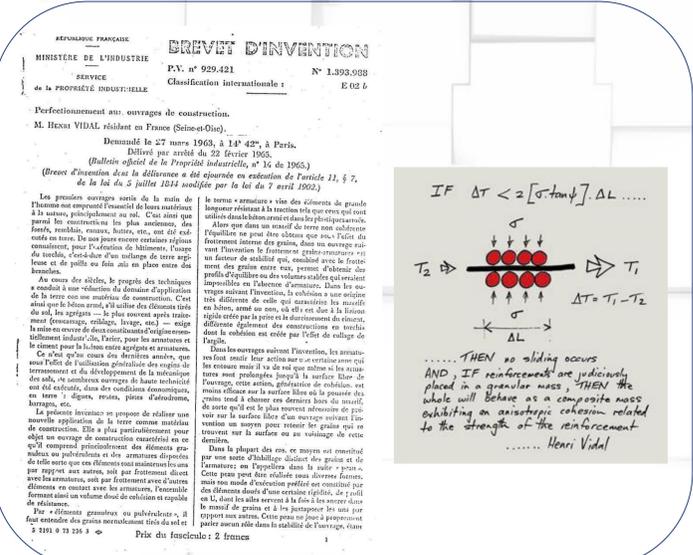


HENRI VIDAL & LA TERRE ARMÉE

The invention of the reinforced earth technique and the worldwide development of the company by Henri Vidal
 By **Laura Kerner**, young member of the French Society for Soil Mechanics and Geotechnical Engineering (CFMS Jeunes),
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“Henri Vidal was a brilliant inventor, who conceived *Terre Armée* with very few experimental results, and a pioneer in soil reinforcement. His invention is one of the main discoveries in Civil engineering during the 20th century”, Prof. François Schlosser



1963
1st patent application

Henri Vidal (1924 – 2007) was a French engineer and architect. In 1957, he invented the concept of *Terre Armée* on a beach, by considering a mix of sand and pine needles, that exhibited better mechanical properties than the sand alone.



1957
1st experiment by Vidal

1965
1st retaining wall Pragnères, France



The technique

Terre Armée (Reinforced Earth) is a composite structure made up of:

- Earth: a granular backfill
- Strips: they can be flat, metallic or synthetic, and are placed horizontally at regular intervals
- Shell: the reinforced earth mass is faced with modular precast concrete panels

Stability is ensured by friction between strips and the backfill. This ideal combination provides long-lasting gravity retaining walls of any height.



The company

The *Terre Armée* company started in 1968 in a tiny office with 4 employees, including the great duo responsible for its success: Henri Vidal & Maurice Darbin. The 70s was the decade of all challenges, with the development of the company both in France and worldwide (USA, Spain, Japan, etc.). In the 80s, the French branch of *Terre Armée* already had 250 employees, with 80 % of the projects outside France. In the 90s, the great duo retired. Since 1998, *Terre Armée* is part of the Freyssinet Group. The company is still expanding in the world, with the creation of Reinforced Earth India in 2006.

1968
Creation of *Terre Armée Inc*



1971
Creation of *RECO, USA*



1974
Agreement with Sumimoto & Kawasho, Japan

1992
10⁷ m² of *Terre Armée* structures in the world

2013
50th anniversary of *Terre Armée* patent



1970 - 1974
Research program with LCPC

1972
Creation of *Tierra Armada, Spain*



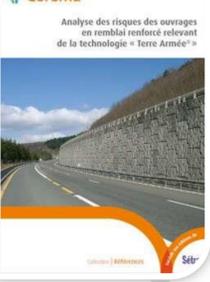
1979
1st design recommendations LCPC/Sétra

1998
Terre Armée part of Freyssinet Group (Solétanche Freyssinet since 2009)

2014
5 · 10⁷ m² of *Terre Armée* structures in the world

The research

To validate Henri Vidal's invention, an great research programme, including full scale walls, started in 1966 in the soil mechanics department of LCPC Paris, under the enthusiastic guidance of François Schlosser. The 1st design standard was edited in 1979 by LCPC and Sétra. New standards are regularly edited (new *Terre Armée* techniques, maintenance of structures, ...).



In 2021, the world's tallest reinforced earth structure was completed in Tindharia, India.