



GEOGRID FOR EXISTING BURIED PIPELINES CROSSINGS

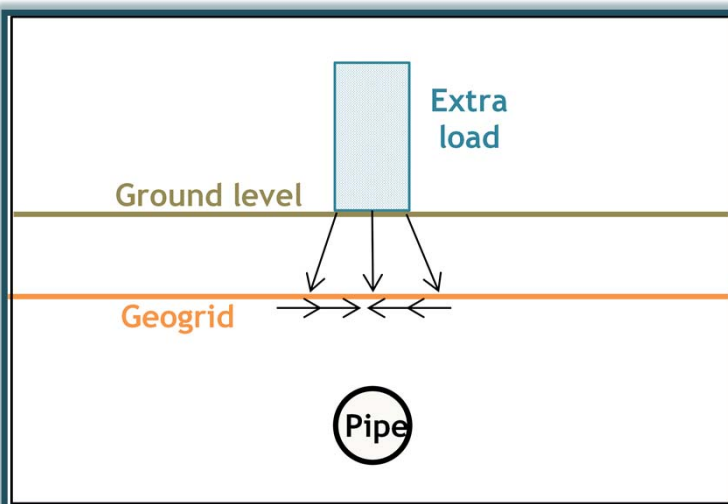
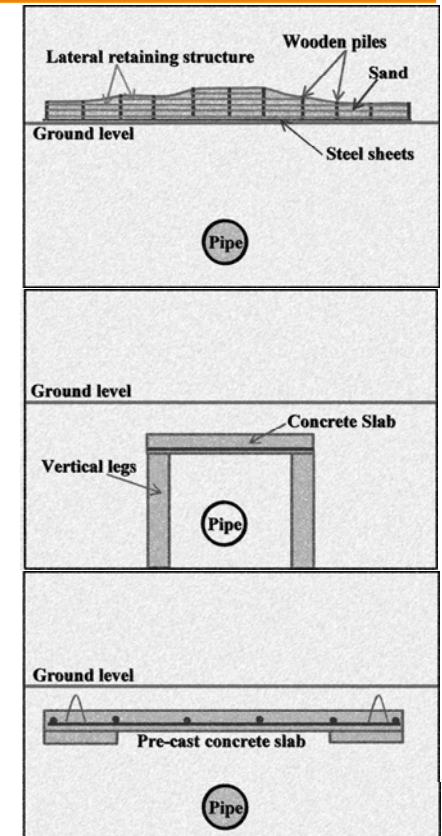
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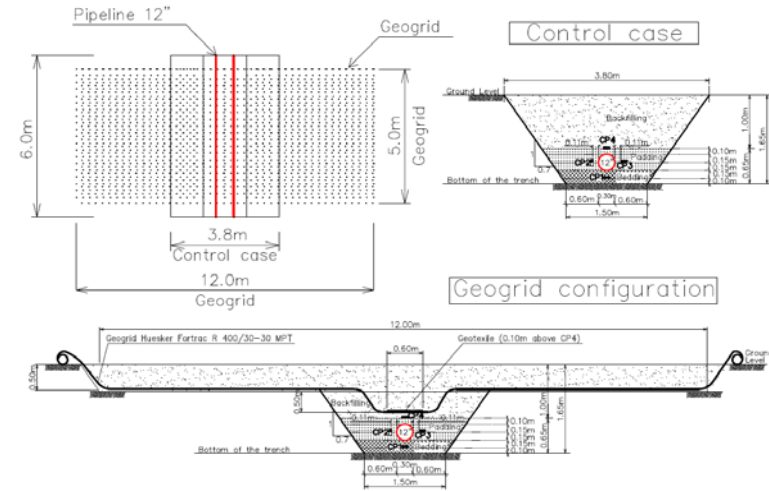
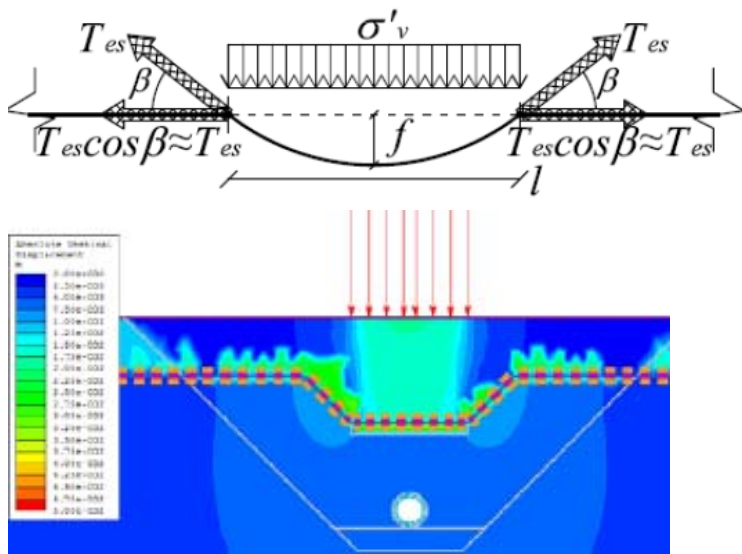
Findings

- ✓ Construction of new infrastructures often require existing buried pipeline crossings not specifically designed for extra loads imposed by new crossings .
- ✓ Induced extra loads cause further soil stresses that can be critical for existing pipes not specifically designed to support traffic or equipment. A wide range of methods has been developed and applied over the years in order to reduce soil stresses around the pipe but sometimes the solutions are too sophisticated, expensive or time consuming.
- The method proposed and tested is to use an **EASY TO INSTALL, LOW-COST AND LIGHT BRIDGING METHOD** to reduce the additional soil stresses on the buried pipeline
- The idea is to place a **GEOGRID** between the pipe and the ground in order to transfer the extra load into internal action of the geogrid



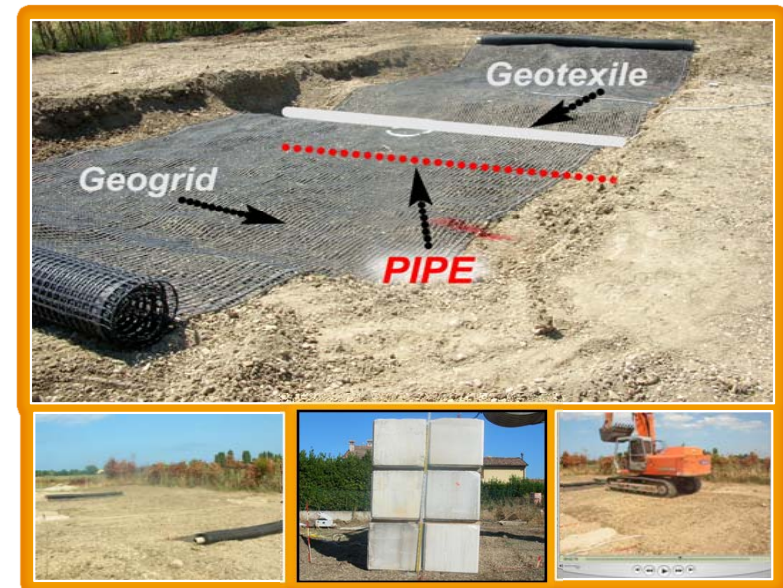
Solutions

- ✓ After assessing suitable alternatives for geogrid configurations by sensitivity and FEM analysis, **FIELD FULL SCALE TESTS** have been performed.



The main equipment consisted of:

- ✓ 4 pressure cells & 4 strain gauges
- ✓ **GEOGRID** with
 - ultimate tensile strength → 400 kN/m,
 - short term tensile stiffness → 8,000 kN/m,
 - mesh size → 30mm x 30mm
- ✓ EXTRA LOAD surcharge
 - static → 6 concrete blocks (150 kN)
 - dynamic → excavator (200 kN)



Achievements

➤ SOIL STRESSES AROUND THE PIPE

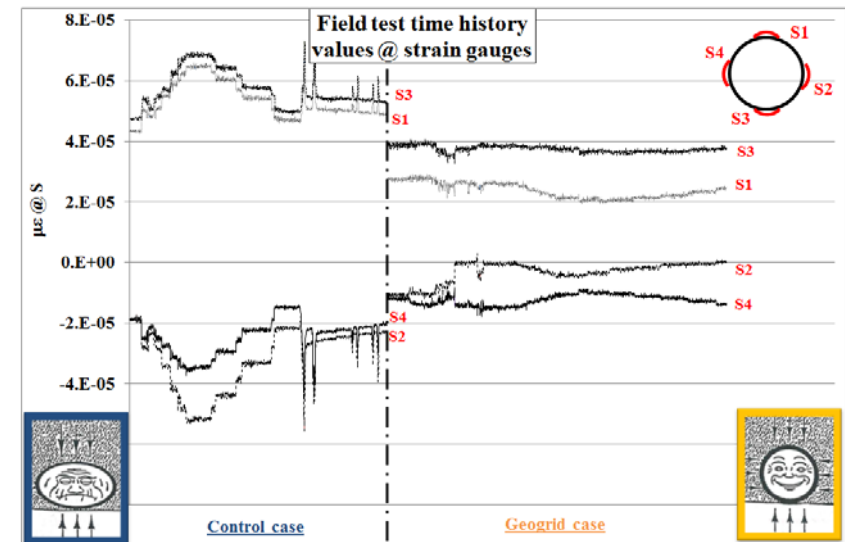
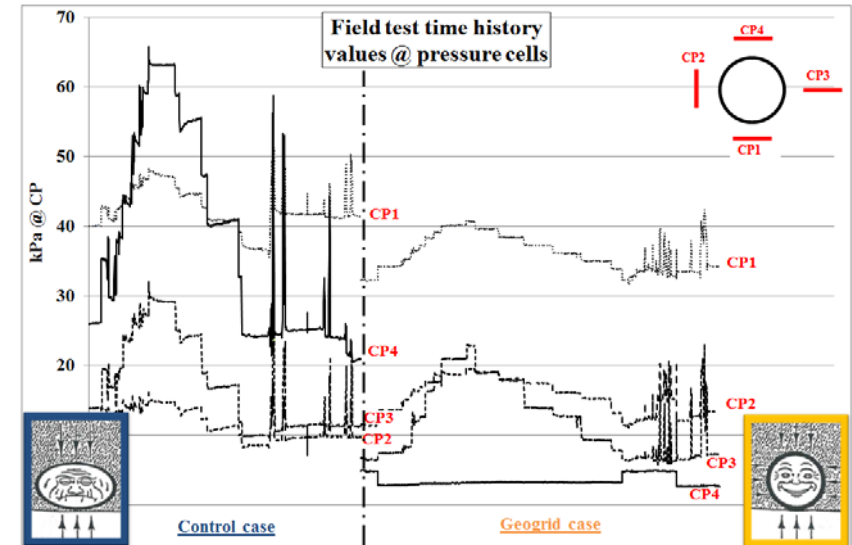
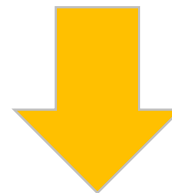
Geogrid:

- ✓ strongly reduces the vertical stress on the top of the pipe
- ✓ reduces the vertical stress at the bottom and laterally of the pipe
- ✓ slightly increases the horizontal stress at the mid height inducing confining effect on the pipe

➤ PIPE OVALIZATION (DEFORMATION)

Geogrid:

- ✓ keeps the pipe in a nearby undisturbed condition, reducing the global ovalization effect that exists around the pipe when only the soil is present



GEOGRID CAN BE SUCCESSFULLY USED TO REDUCE THE OVERALL STRESS INDUCED ON THE BURIED PIPELINES BY ADDITIONAL LOADS, AVOIDING PIPE OVALIZATION