

# The Reinforced Earth® technique, a major innovation

Recognised as a major innovation in the field of civil engineering, the Reinforced Earth® technique provides numerous structural solutions for owners and contractors ranging from retaining walls to bridge abutments.

As the world leader in mechanically stabilized earth, Terre Armée Group has a presence in all five continents and has the advantage of both local and international expertise.

This wealth of expertise, has led the company to develop processes offering common advantages:

- Reliable and sustainable materials
- Savings in terms of time and resources
- Capacity to adapt to complex situations
- Integration into the environment, in particular due to an extensive range of panel finishes

The Reinforced Earth® technique has revolutionised structural design and is applicable for all kinds of structures:

- Road
- Railway
- Marine and waterway
- Industrial and protective

Highway C470, Denver, Colorado, USA



Our goal is to create, design and supply innovative techniques to the civil engineering industry with a strong commitment to excellence in design, service and public welfare.

## Sustainable Technology



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# TerraLink™

The shored Reinforced Earth® wall system



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The shored Reinforced Earth® wall system



Friction Link system with steel strips

The TerraLink™ technique allows the construction of Reinforced Earth® walls in front of existing structures, with narrow space between them. Since the reinforced fill zone is not wide enough to accommodate conventional lengths of reinforcements, the acceptable solution consists in connecting the Reinforced Earth mass to the existing structure. The whole configuration, called TerraLink™, forms a shored retaining wall that ensures a sound structural behavior.

TerraLink™ elements are similar to those used for Reinforced Earth® solution: soil reinforcements (steel or geosynthetic), connected to modular facing systems (precast concrete panels, welded wire mesh and connection parts). These elements are placed between well compacted backfill layers. The main feature is that reinforcements are linked to the rear part (backface) of the system through the existing structure, which enables combination or continuity of the reinforcements between the narrow Reinforced Earth® wall and the existing structure.



Friction Link system with synthetic strips

## Two types of linked system are possible

The choice of the appropriate system depends on several factors: geometrical site configuration, type of existing structures, and type of reinforcements among other considerations.

### Friction Link system

Additional reinforcements are inserted between the reinforcement layers of Reinforced Earth® wall and attached to the existing structure. The overlaps between reinforcements ensure their frictional connection on both sides of the structure. This solution has the advantage to keep the flexibility of the combined wall system but requires sufficient space for overlaps of the reinforcements.

### Direct Link system

The reinforcements of the Reinforced Earth® wall are directly connected to the existing structure. This solution easily adapts to very narrow or limited space but requires further precautions in terms of construction.

## Adaptation to existing structure

The existing structure or natural feature against which the Reinforced Earth® wall is constructed has its importance to the TerraLink™ design, especially in determining the suitable technique for attachment of the reinforcements.

The existing structure could be a soil nail wall, Reinforced Earth wall or other retaining wall, or an existing natural feature such as sloped terrain or bedrock. Whatever its origin, a specific assessment is required to ensure that the existing structure is safe enough or needs evaluation of the consolidated works to support the new load configuration.



Direct Link system with synthetic strips



North Tarrant Express near Dallas, Texas, USA



N1 Gauteng Freeway widening, Johannesburg, South Africa



Kemahisar-Pazanti motorway, Turkey

## Field of application

The TerraLink™ system is an excellent alternative when site constraints prevent the construction of traditional gravity retaining walls. Its field of applications depends on environmental, technical and economic considerations.

### Widening of platform in urban environment

Due to the increase of traffic, providing a widened platform is often necessary. In restricted urban areas the construction of new ramps is often just in front of existing ramps. A standard retaining wall would have the drawback to partially dismantle the current ramp in order to build the new one. The TerraLink™ system enables the construction of the new ramp while keeping in place the existing wall, maintaining traffic use for most of the construction time.

The main advantages are:

- + Reduced footprint at the base of the structure
- + Minimal disruption of the traffic flow during construction
- + Speed of construction
- + Saving demolition of the current structure
- + Reduction of select backfill volume

### Construction in steep topography context

Another main application is the construction of retaining walls in sloped terrain such as an existing embankment, cut slope or rocky outcrop.

A standard retaining wall solution requires wide and expensive earthworks, including costly excavations. The use of TerraLink™ system reduces the footprint compared to traditional solutions, and consequently the volume of excavated materials.

The decrease of excavation and backfill material make this technique both sustainable and economical.

The main advantages are:

- + Reduced footprint at the base of the structure
- + Economy of excavation works
- + Decrease of excavated materials (Economy of recovery/landfill or treatment)
- + Speed of construction
- + Reduction of technical backfilling
- + Continuity of facing appearance with other adjacent full volume Reinforced Earth walls



RN 116, Grèzeaux du Pallat, France



I-215 On-Ramp to Southbound I-15 Ramp widening Salt Lake County, Utah, USA



L'angeni, South Africa



North Tarrant Express near Dallas, Texas, USA



RC 62 near Sion, Switzerland