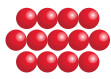
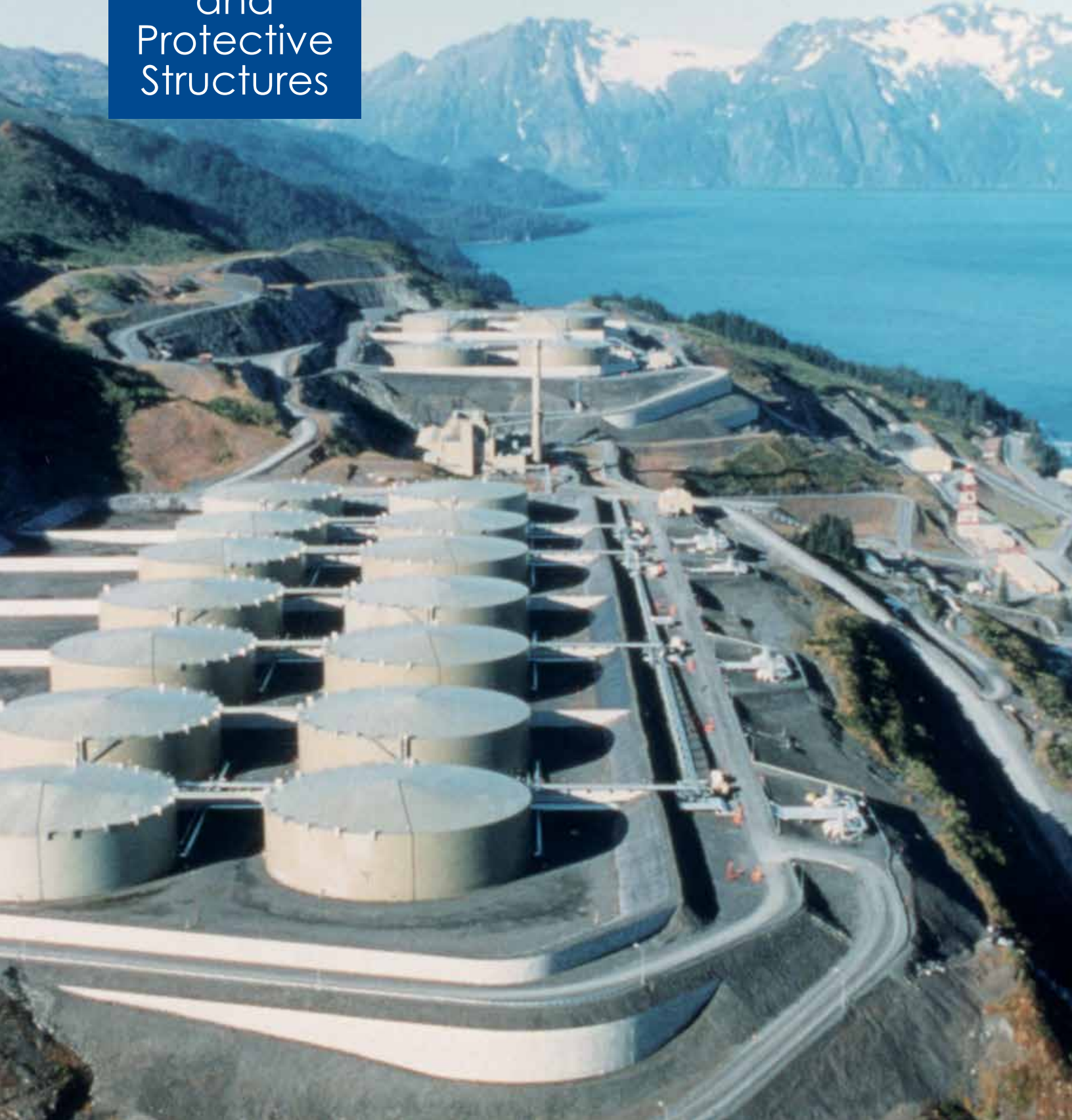


Risk  
Mitigation  
and  
Protective  
Structures



REINFORCED EARTH®



# The Value of Experience

Reinforced Earth® technology has a wide scope of applications that extend well beyond roads and bridges. The advantages of the Reinforced Earth system expand into many other markets. Protective structures have been designed to mitigate risks either natural or from human origin, thus contributing to a better environment. Each wall is a coherent gravity structure, custom-engineered by The Reinforced Earth Company (RECo) to project-specific requirements including applied loading, foundation conditions and aesthetics. With experience gained over more than forty years and 40,000 structures, Reinforced Earth is recognized throughout the construction industry as the most efficient and economical solution to ordinary and extraordinary earth retention and structural load support requirements.

The primary components of a Reinforced Earth structure are discrete, galvanized steel high-adherence soil reinforcing strips, reinforcing ladders or welded wire bar mats, granular backfill and precast concrete facing panels. These components work together to produce a unique, composite construction material having great strength and stability, a limited footprint and the ability to distribute loads uniformly, even on poor foundation soils. The superior structural performance and longevity of Reinforced Earth structures derives from the permanent and predictable frictional bond between the backfill and the reinforcements and from the reliable mechanical connection linking the reinforcements to the facing panels.

The inherent strength and flexibility of the Reinforced Earth wall system gives owners, and their engineers and contractors a powerful way to find structural, geotechnical and economical solutions for projects of all types, sizes and complexities. And by working with RECo, all parties can reduce uncertainty and improve their bottom line.

Experience the engineering excellence, the architectural creativity, and the unyielding focus on quality and customer support that we bring to every project.

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

Make Your Next Project a Success by Selecting Reinforced Earth.

# Protective Barriers

Protective barriers from The Reinforced Earth Company can provide crash and intrusion protection as well as access security for a wide variety of facilities and businesses. These protection features can be incorporated into standard Reinforced Earth structures to limit damage to critical infrastructure such as bridge piers and piles. Protection may also take the form of a free-standing structure such as a Reinforced Earth deflection wall or a Fanwall® barrier.



Concealed Crash Wall Construction

## CONCEALED CRASH WALL

The patented Reinforced Earth retaining wall/ concealed crash wall combination comprises a low-height, energy absorbing concrete crash barrier concealed within the Reinforced Earth mass. Concrete poured between the hidden, wire-faced Reinforced Earth structure (back form) and the normal Reinforced Earth precast facing panels (front form) resists and deflects impact. Facing panels continue above the crash wall to the top of the structure, supported by typical high-adherence soil reinforcing strips and granular backfill, producing a Reinforced Earth wall from bottom to top.



Deflection Walls, MARTA Bridge Piers

## DEFLECTION WALLS

Reinforced Earth retaining walls can protect other structures from crash impact, as illustrated by railroad deflection walls. Specially designed and constructed adjacent to or surrounding bridge piers or other critical components, Reinforced Earth structures deflect and spread the crash impact load. In this picture, Metropolitan Atlanta Rapid Transit Authority (MARTA) elevated track piers are protected against freight train derailment by pier-surrounding, closed-cell Reinforced Earth retaining walls. Steel rails on the facing enhance the protection.



Barrier Panel with Incorporated Door Opening

## SECURITY BARRICADES

The Reinforced Earth Company's Fanwall reinforced concrete barriers provide superior protection against trespassing, theft, and sabotage. Fanwall concrete barriers cannot be cut, sawed, drilled or broken. They are tested for ballistic resistance and can also prevent breaching by speeding vehicles. Maintenance-free concrete does not rust, corrode, rot, or burn. In addition, these high, solid walls provide an obscuration screen for protection against standoff weapons. The walls also provide an excellent mount for lights, intrusion detection and surveillance systems, and other security and protection devices.

# Natural Disasters

Throughout history Nature's forces have proven to be overwhelmingly dangerous, causing heavy loss of life, injuries and extensive damage to property. Reinforced Earth techniques can help mitigate the consequences of such natural disasters. Reinforced Earth provides such protection through its intrinsic characteristics.



Following Izmit Earthquake (Turkey)

## EARTHQUAKES

An effective way for a structure to resist strong motions due to seismic activity is to exhibit sufficient flexibility in order to dissipate the applied energy while not attracting detrimental loads on critical structural elements. The inherent ductility and resilience of Reinforced Earth justify its high degree of acceptance in regions exposed to earthquakes. There are many documented examples of excellent performance during seismic events.



Avalanche Barrier

## AVALANCHES

With the same philosophy of resilience and flexibility, Reinforced Earth structures are commonly used to protect properties and commodities against avalanches. Using steel mesh facings of systems such as TerraTrel® or GeoTrel™ provides additional flexibility while allowing easier logistics and construction in remote areas or sites with difficult access.



Tunnel Extension

## ROCKFALLS AND SLOPE FAILURES

TechSpan®, a precast arch system, provides protective solutions to mitigate the effects of rockfalls and slope failures at the extremities of tunnels. TechSpan arches can be designed to fit neatly to the shape of the tunnel and can be installed without disrupting the flow of traffic.



River Wall

### **FLOODS, TSUNAMIS, MUD AND LAVA FLOWS**

Due to its lower use of construction materials as compared to regular embankment and its suitability to build vertical and battered walls, as well as steepened slopes, Reinforced Earth is a perfect solution for protection dikes or channeling walls. Reinforced Earth solutions protect against a variety of potentially hazardous naturally aggressive events such as water in case of floods or tsunamis, but also debris flows and even lava.



Stabilization of Landslide

### **LAND SLIDES**

By minimizing the quantity of building materials, Reinforced Earth is a flexible and easy-to-build technique which has been used in some specific cases to provide active protection against potentially hazardous landslides.



Sea Wall



Rain to Recreation - Flood Prevention

# Industrial Hazards

Within an increasingly regulatory framework regarding the potential for industrial explosions, fire and pollution, the use of Reinforced Earth for vital structures designed to protect against such hazards has been a logical extension of the technology following its documented performance in other applications.



LNG Containment Dikes

## CONTAINMENT

Reinforced Earth is used to construct safety dikes around large tanks of liquefied natural gas (LNG) and other volatile liquid petroleum products. In the event of a rupture in one of these tanks, the function of a Reinforced Earth dike is twofold: containment of the escaping fluid and prevention of damage to nearby tanks and facilities.



Blast Barrier

## FIRE AND THERMAL SHOCKS

Reinforced Earth is an ideal material for the construction of industrial protective structures since its components are substantially non flammable and resistant to thermal variations. Tests have shown that Reinforced Earth could withstand the drastic impact of a fire following the leakage and ignition of a cryogenic fluid. The thermal resistance of Reinforced Earth was proven during the effects of the 1978 fuel tank fire at the Tanco Electric facility in Caracas. Documentation of the disaster concluded that the Reinforced Earth barrier was decisive, preventing the flaming fuel from escaping and propagating to the nearby power plant.



Patented Ammunition Shelters

## EXPLOSIONS

Experience has shown that Reinforced Earth is a highly stable explosion barrier that impedes the propagation of a blast at ground level and absorbs high levels of energy due to its tolerance for deformation. Because it is resistant to multiple fracturing, Reinforced Earth minimizes the dispersal of debris during an explosion. The positive results of early studies and experiments have subsequently been confirmed by the performance of structures in service.



Nuclear Accident Mitigation

### SPILLS

Reinforced Earth structures have proven to be virtually impermeable despite the fact that they are composed of small, discontinuous elements. Combined with appropriate and adequate joint protection, Reinforced Earth provides a convenient solution for the storage of waste outputs from industrial processes and accidental spills and can withstand a wide range of chemical aggressiveness.



Live Coal Slot Storage

### MINERAL DUST

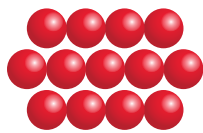
At the start of the dramatic increase in coal and lignite mining production output in the 1970's The Reinforced Earth Company developed an efficient solution for live ore storage facilities. Large span roof structures covering these storage facilities prevent dust migration and thus reduce the negative impact on health and environment.



Sedimentation Basin



Blast Barrier



**REINFORCED eARTH®**

**SCAN**  
to see  
our locations  
across the  
United States



800.446.5700

[www.reinforcedearth.com](http://www.reinforcedearth.com)

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