Railway Applications

REINFORCED EARTH®

Technology

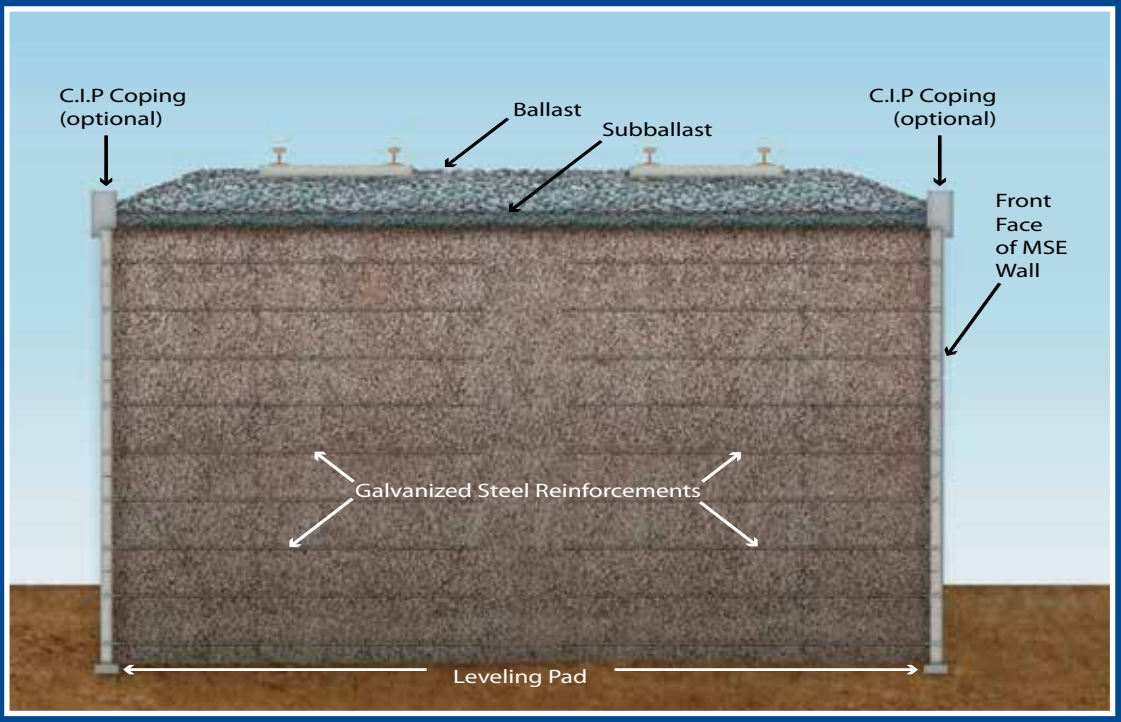
Reinforced Earth® technology is ideally suited to railroad applications such as support of track bed, bridge and trestle abutments, earth retention structures adjacent to rights of way, and deflector walls to protect bridge piers from impact in the event of a derailment. Each wall is a coherent gravity structure, custom-engineered by The Reinforced Earth Company (RECo) to project-specific requirements including applied loading, foundation conditions, and aesthetics. With experience gained through forty years and 40,000 structures, Reinforced Earth is recognized throughout the construction industry as the fast, economical solution to ordinary and extraordinary earth retention and load support requirements for railroads and mass transit, as well as for bridges, roadways and other civil engineering structures.

The primary components of a Reinforced Earth structure are discrete, galvanized steel high adherence reinforcing strips or reinforcing ladders, 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 rail and transit owners, and their engineers and contractors, a powerful way to find structural, geotechnical and economic 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.

Make Your Next Project a Success by Selecting Reinforced Earth.



Typical Section

Features

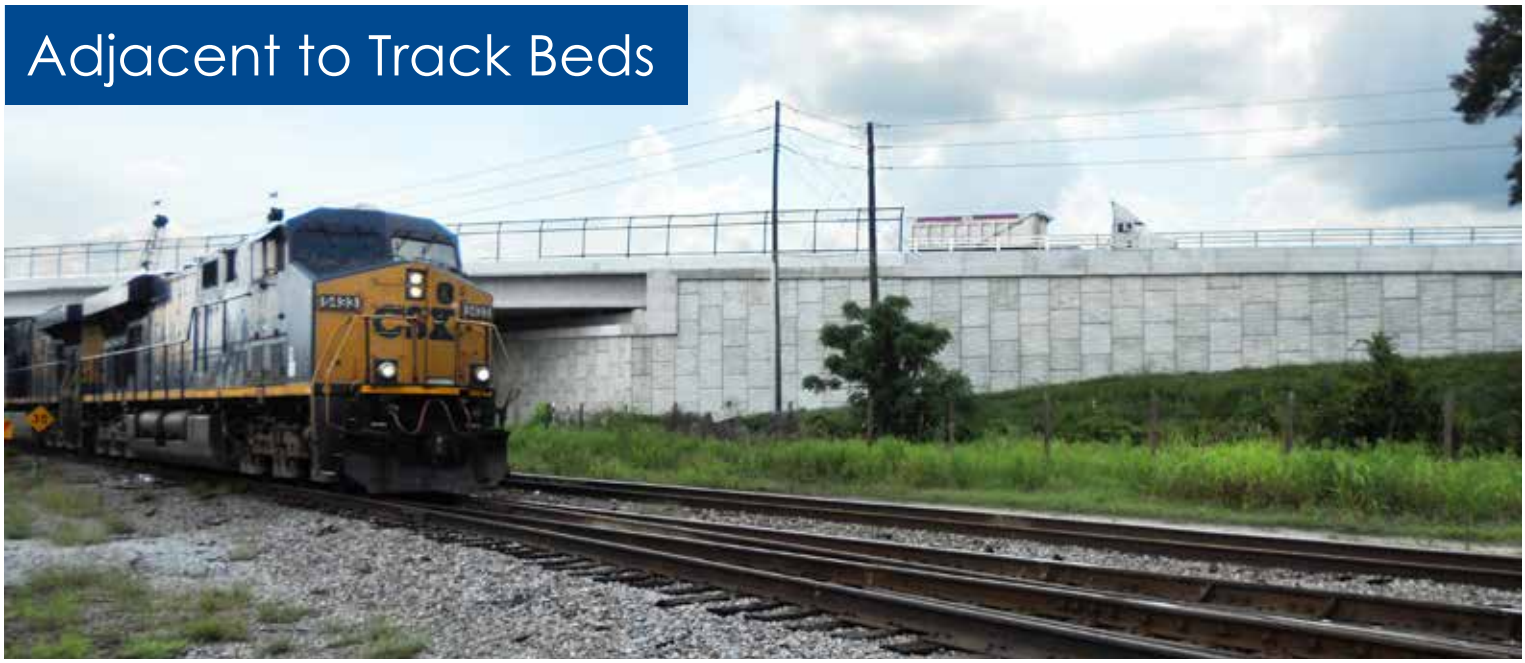
Reinforced Earth structures offer unique features of special interest to railroad and mass transit projects:

VIBRATION RESISTANCE – RECo's standard design easily accommodates the effects of the largest vibrations, including during-construction vibration from adjacent active rail lines. This property is closely related to Reinforced Earth's ability to resist major earthquakes with little or no damage, as documented after the Loma Prieta, California (1989), Northridge, California (1994), Kobe, Japan (1995), Izmit, Turkey (1999) and Maule, Chile (2010) earthquakes, among many others.

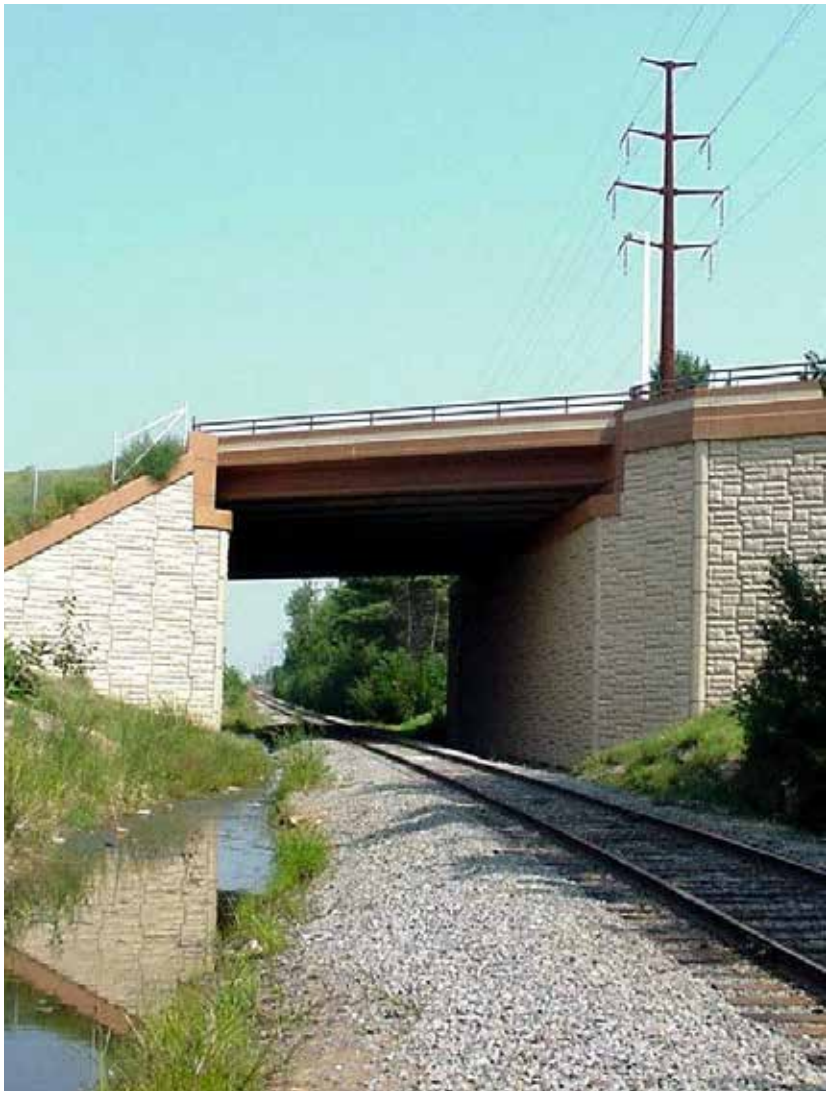
STRAY CURRENT AND CORROSION RESISTANCE – Reinforced Earth structures provide superior stray current performance for electrified railways. The discrete galvanized steel reinforcements are electrically isolated from each other and are typically oriented parallel to the direction of stray current flow, preventing them from collecting or conducting stray currents. In addition, the Reinforced Earth backfill has high resistivity by specification, inhibiting the operation of electrical cells that result in metal corrosion and facilitating a wall design life of 75 or 100 years, or more.

CONSTRUCTION IN TIGHT QUARTERS – Since it is flexible and built both within narrow limits and in successive layers, Reinforced Earth is well suited to the construction of new structures against, or even above, existing embankments, as well as for the joining of new and old embankments. Where it is not possible to excavate below rail lines in service, a special design having shorter reinforcements may sometimes be used in the lower portion of the wall, thereby requiring a narrower excavation.

Adjacent to Track Beds



In addition to its primary advantages of flexibility, rapid construction and cost savings, a Reinforced Earth structure requires very little space; making it ideal when building walls parallel to a railway. Structure foundations are shallow and do not require footings that extend beyond the front face of the wall, so excavations do not encroach upon rail line beds. And Reinforced Earth walls may be built entirely from the backfill side, requiring neither scaffolding nor any structure or equipment in front of the wall. The face of the structure can be placed right up to a clearance line or service road with little or no disruption of rail service.

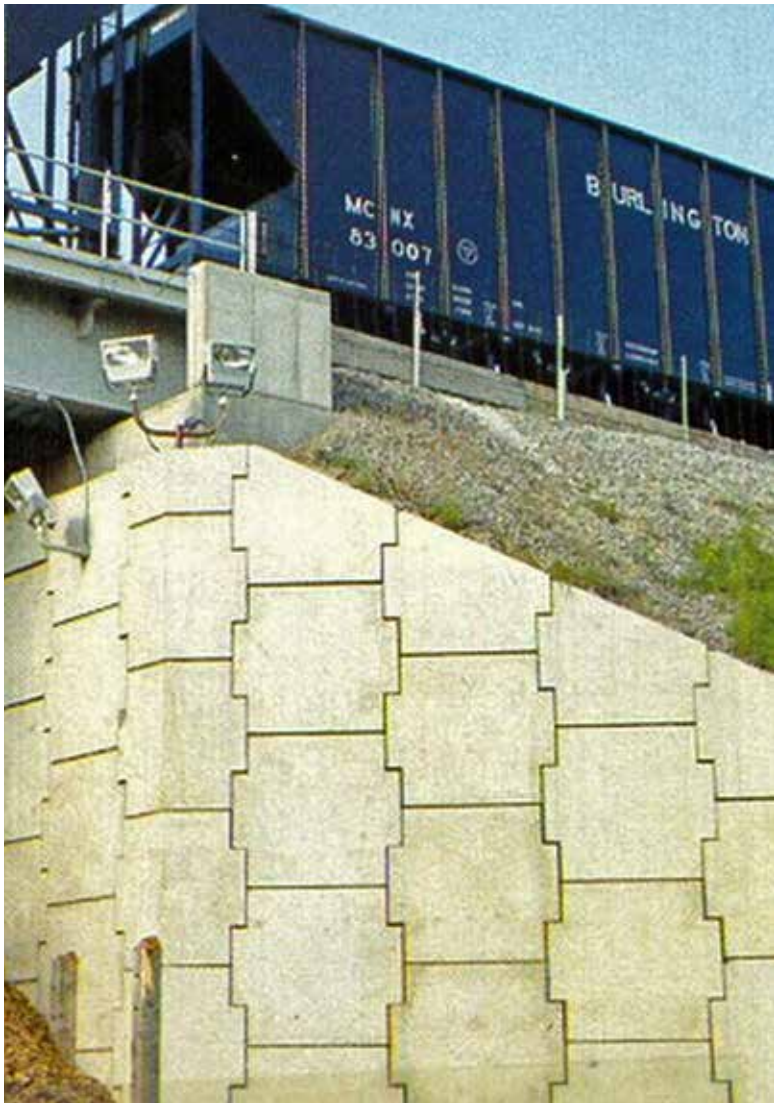


Supporting Track Beds

The soil of a Reinforced Earth structure is compacted granular fill, often similar to track ballast, so the structure has very high strength and can easily support Cooper E80 or similar loading. But this structure is also an embankment, applying relatively low, evenly distributed bearing pressure to the foundation soil and eliminating the need for major excavations or deep foundations. The inextensible steel reinforcements assure minimal deformation under high load, while the single-bolt mechanical connection allows easy pivoting of reinforcements to clear obstructions such as abutment piles, traction power masts and drainage structures. And, since retained fill track beds often traverse populated areas, the wide range of architectural treatments available for Reinforced Earth's precast concrete facing panels offers a significant benefit in meeting community aesthetic requirements.

Abutments

Bridge abutments are considered critical structures and the unique strength and load distribution capabilities of Reinforced Earth address this in an economical and structurally efficient way. For many bridges, a spread footing bridge seat can be supported directly on the reinforced soil, thus eliminating the piles. When piles are necessary, they are fitted between the reinforcing strips, or the strips can be pivoted to clear the piles, resulting in a simple retaining wall surrounding the abutment structure. In both configurations, the shallow foundation depth typical of Reinforced Earth structures and the limited use of cast-in-place concrete lead to significant time and cost savings.



Tunnels

TechSpan®, a three-hinged precast concrete arch system, is also designed and supplied by The Reinforced Earth Company. Used for railway tunnels constructed beneath embankments or by cut and cover techniques, a TechSpan arch system consists of custom-designed half arch units which are optimized to meet project-specific loading requirements. The units meet at the crown and are supported by a footing sized for site specific conditions. TechSpan offers the benefits of structural efficiency, speed of construction and economy, all significant advantages when building over operating tracks and/or supporting very high embankments. Reinforced Earth is a logical complementary technology for the construction of spandrel and wing walls between and flanking TechSpan tunnels.

REINFORCED EARTH®

SCAN
to see
our locations
across the
United States

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www.reinforcedearth.com

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