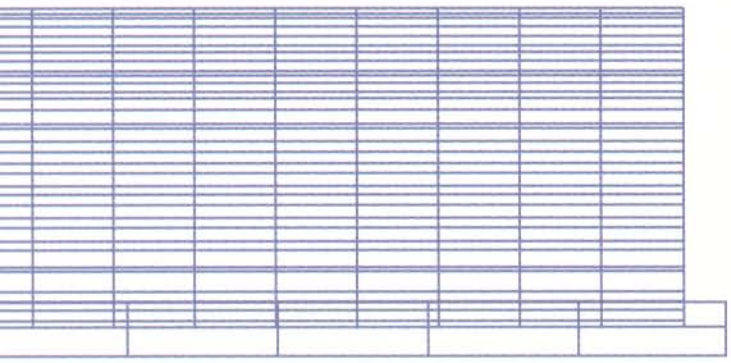
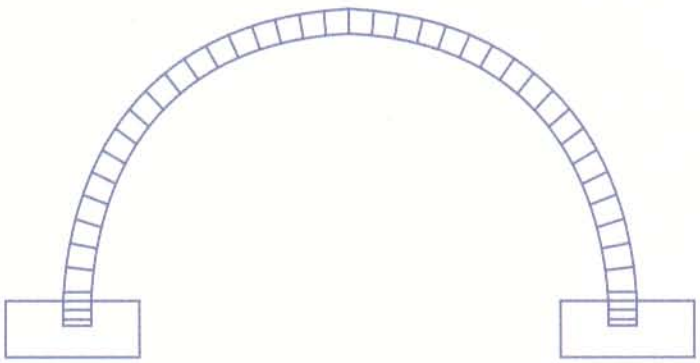
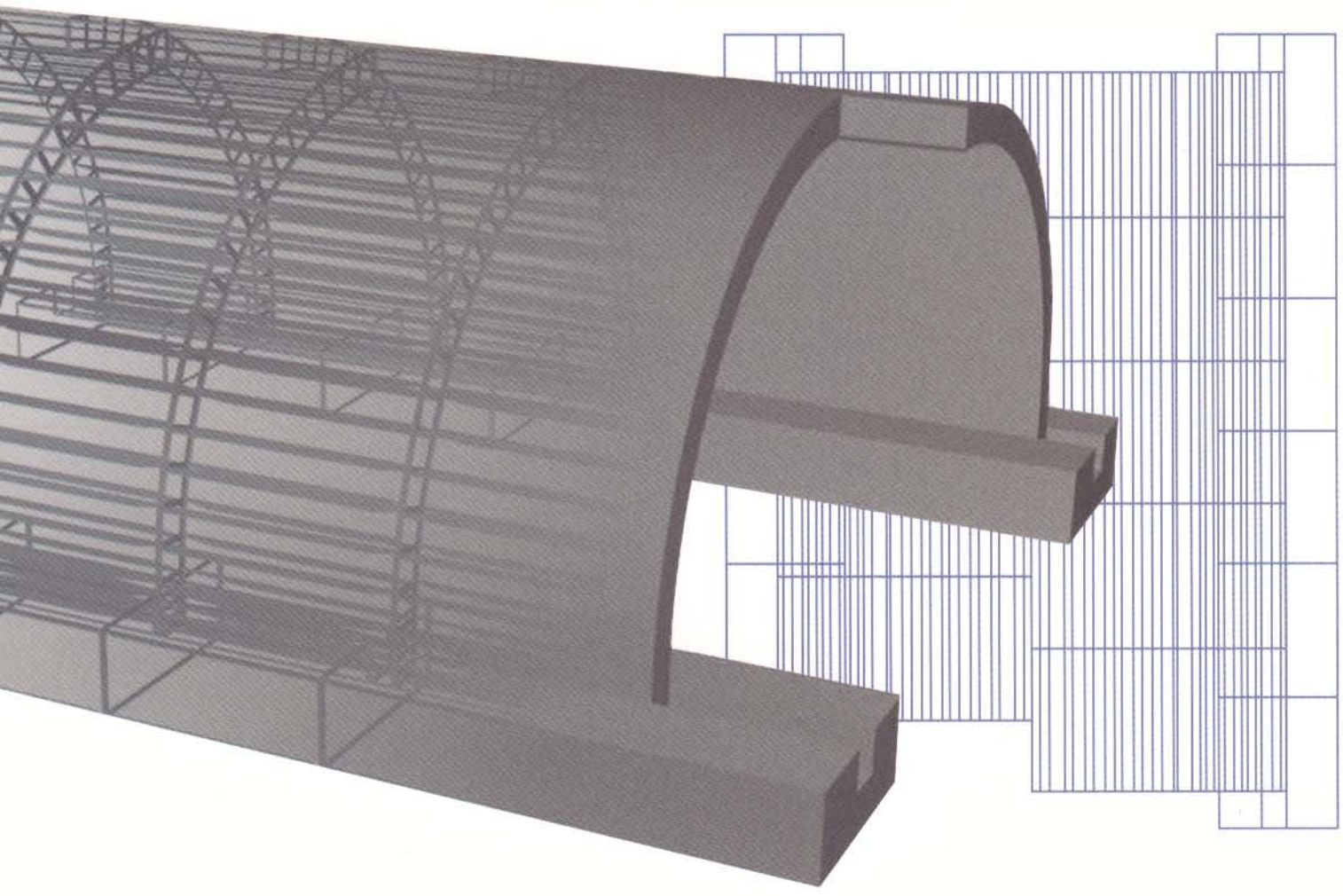
TechSpan™

by Reinforced Earth Companies







Environmentally sensitive creeks spanned without disturbance.

TechSpan™ ...The segmental precast arch from the REINFORCED EARTH COMPANY.

TechSpan™ precast arches provide all the benefits of precast concrete structures plus a number of additional advantages over other culvert, bridge or arch systems:

- simple, rapid, predictable construction without scaffolding or formwork requiring only a small crew and conventional equipment.
- unique precasting methods conforming to any shape without being limited by set precast form sizes.
- state of the art design selects the best arch shape to minimize in-service bending moments and reduce costs.
- comprehensive technical design service, high quality materials and professional construction assistance all from the Reinforced Earth Company.

These advantages have translated into the most reliable, cost effective, precast arch system with more than 500 installations worldwide. Ideally suited for the construction or replacement of:

- water culverts
- rail bridges
- road bridges
- mining/industrial access tunnels

INSTALLATION

- Precast concrete elements shipped to site
- Rapid and safe erection
- Uninterrupted traffic flow
- Can be used with Reinforced Earth® headwalls and wingwalls

COST EFFECTIVE

- Durability of precast concrete gives long service life with low maintenance
- No maintenance of bearings or joints
- Cost savings increase as height of fill increases

WE'LL ESTIMATE THE COST

Based on location, schedule, geometry and loading

During TechSpan erection conveyor activity continues.

TechSpan culvert accomodates channelized flow.

Elements can be installed directly from truck with timely coordinated deliveries.

Cost effective and structurally efficient TechSpan "arch shape" for high fills (ultimate fill height 35m).

ADVANTAGES OVER RIGID FRAMES OR BRIDGES

- Cost savings
- Rapid construction
- Higher quality of precast vs CIP
- No scaffolding or bracing
- More efficient shape
- Easier construction in freezing temperatures
- Reduces bridge icing
- No bearing pads or joints

Savings of $400,000 generated with TechSpan over originally tendered bridge.

Concerns of concrete spills into creek are eliminated with all precast components.

ADVANTAGES OVER METAL ARCHES

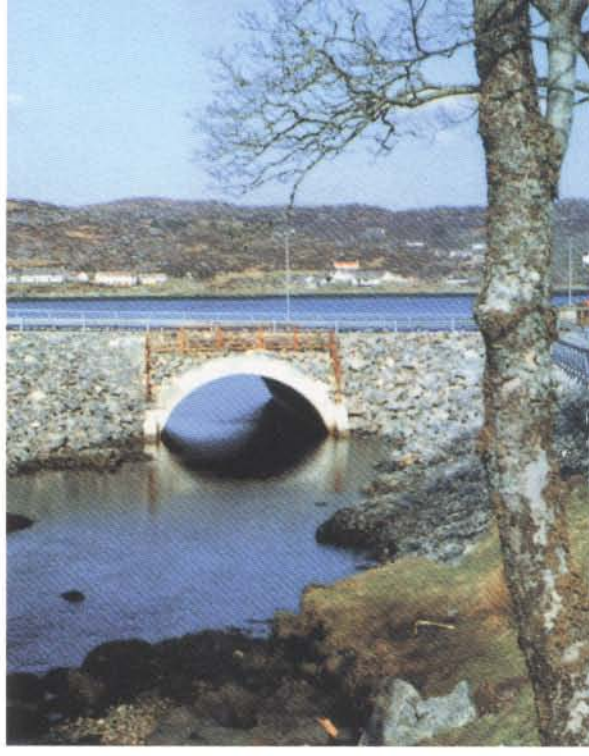
- Lower life cycle cost (*)
- Improved aesthetics
- Faster erection
- Greater durability and longer life
- Easier to construct
- Easier to backfill
- Does not depend completely on soil arching
- Requires less granular material
- Easier to waterproof
- Minimized installation deflection

Sloping head wall easily accommodates skewed crossings.

(*) For a free copy of the Life Cycle Analysis Program "LCA" please call the 1-800 number provided on the back cover. "LCA" was developed by the Center for Studies in construction at the University of Western Ontario in co-operation with the Canadian Concrete Pipe Association, Ontario Concrete Pipe Association, American Concrete Pipe Association, Canadian Portland Cement Association, and Ministry of Transportation Ontario.

ENGINEERING AND DESIGN

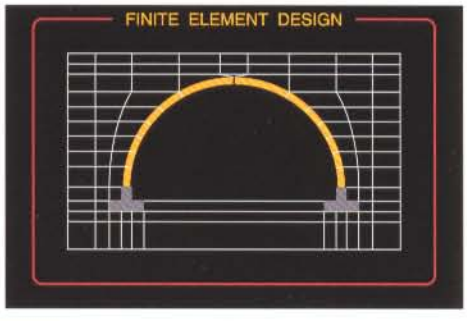
Twin arches over divided four lane roadway.

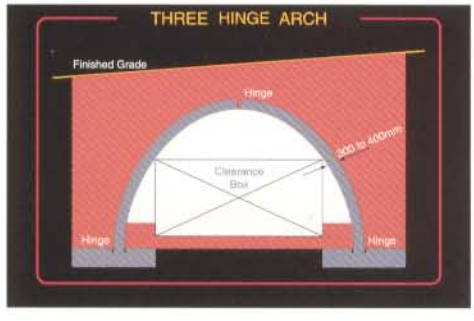


Oversized collars and extended TechSpan length eliminates head walls.

At Reinforced Earth each TechSpan shape is optimized to address site specific clearance and loading requirements resulting in the lowest cost solution.

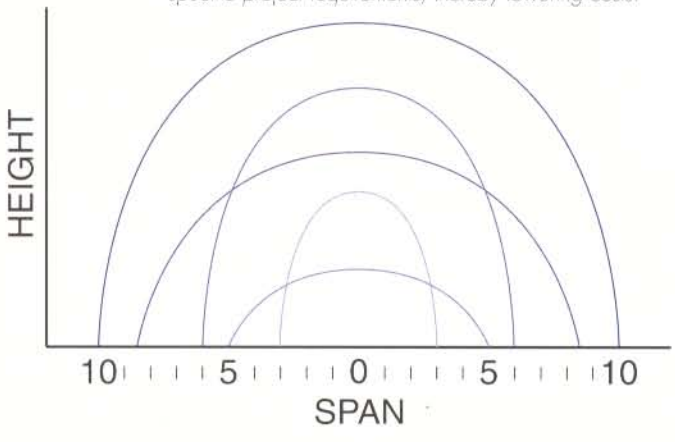
- High quality control standards
- Structural superiority of the "arch" shape minimizes bending moments
- All construction stage loading verified during design
- Designed to clearance box dimensions
- Analyzed as a 3 hinged arch
- Design verification utilizing Finite Element Method Analysis, checks every stage of backfill
- Adaptability of span to site specific requirements (up to 20 meters)
- Flexible steel forming conforms to optimized shape





Ideal for railway underpass, since service is uninterrupted.

With a variable radius form, TechSpan can be optimized to specific project requirements, thereby lowering costs.



PROFESSIONAL SERVICES FROM REINFORCED EARTH COMPANY

The Reinforced Earth Company, established in North America in 1970, offers one source design and supply services from our on-staff Professional Engineers. In addition, we can provide technical expertise on footings, wingwall and headwall construction. Full design and product liability insurance is provided on all projects.

A combination of Reinforced Earth technologies provides technical solutions for environmentally sensitive locations.

TechSpan elements precast to high standards, resulting in structures with low maintenance and long life.

DESIGN SERVICES

- Feasibility studies: Written estimates : Drawings

CONSTRUCTION SERVICES

- Construction drawings : Timely delivery to site : On site guidance

CONSULTATION SERVICES

- Available anytime from our on-staff Professional Engineers

Reinforced Earth's engineered forms are used to precast TechSpan panels.

CONSTRUCTION AND INSTALLATION

TechSpan's rapid erection rates of 10 to 20 lineal meters per day are achieved with only a three man crew and one crane.

- Low erection costs
- Rapid, simple and predictable installation
- No falsework or scaffolding
- No post tensioning
- Uninterrupted flow of traffic
- Panels installed one at a time requiring only one crane (two cranes required for first half day)
- Headwalls and wingwalls with Reinforced Earth® precast panels, or Terratrel™ wire mesh (with or without cast-in-place concrete veneer)

Joints can be covered with geomembrane or geotextile. Optionally the entire arch can be waterproofed.

Temporary Terratrel wall supported "Stage 1" diversion allowing uninterrupted traffic during bridge dismantling.

CIP collar walls are formed after embankment reaches design grade.

Footing recess confirmed before placing first element.

Terratrel collar wall with rock fill..

INSTALLATION IN FOUR SIMPLE STEPS

1. FOUNDATION OPTIONS

- Spread footing with Pedestal

- Spread footing

- Pile Cap on Deep Foundation

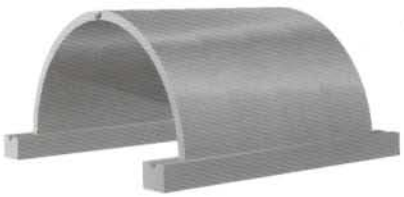
- Raft Foundation

2. TECHSPAN ERECTION

A short TechSpan of 20 meters length is completed in 2 days.

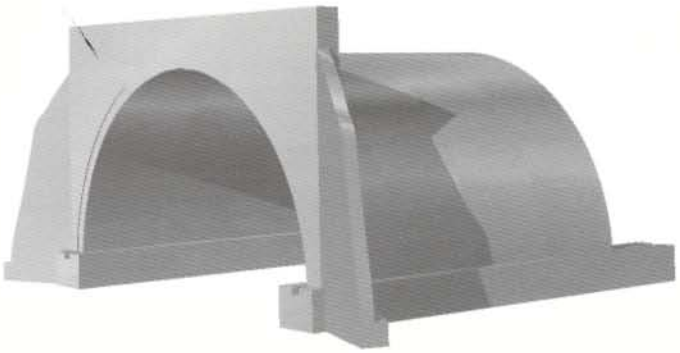
- Each segment lifted by crane and staggered to rest against half of the opposite segment
- Panels installed one at a time requiring only one crane
- Simple repetitive installation with 3 man crew, 1 crane and operator

3. GROUTING



- Grout is placed to fill the keyway in the footing and provide uniform contact at the crown
- Optional crown beam for special conditions

4. BACKFILLING AND HEADWALL



- The arch is backfilled to design height while headwalls and wing walls are constructed
- Headwalls and wingwalls are most economically achieved with Reinforced Earth® collar walls and wing walls

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TechSpan in Australia.

TechSpan construction near Japan's Mount Fuji.

One of Spain's many TechSpan rail underpasses.