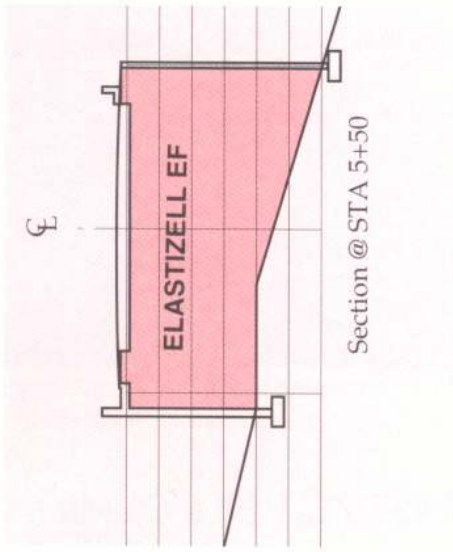
ELASTIZELL EF (Engineered Fill) & Multi-Plate Culverts

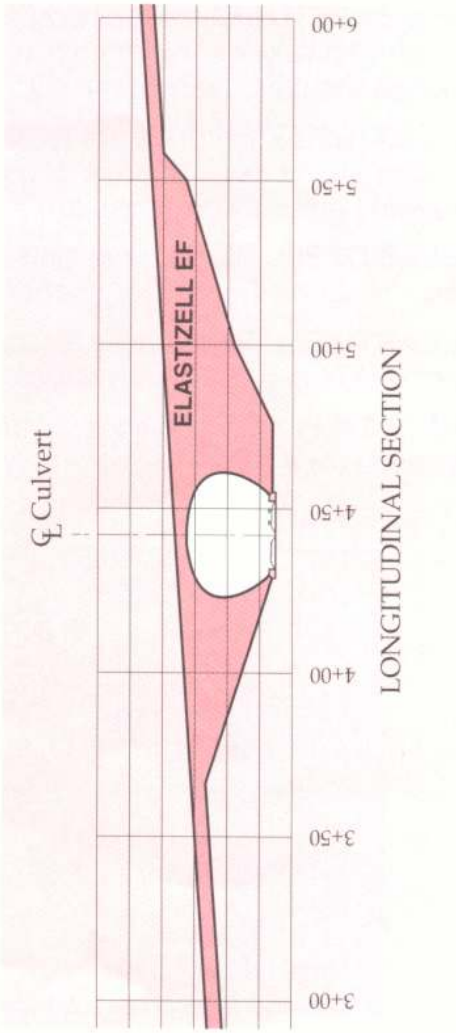
Discussion

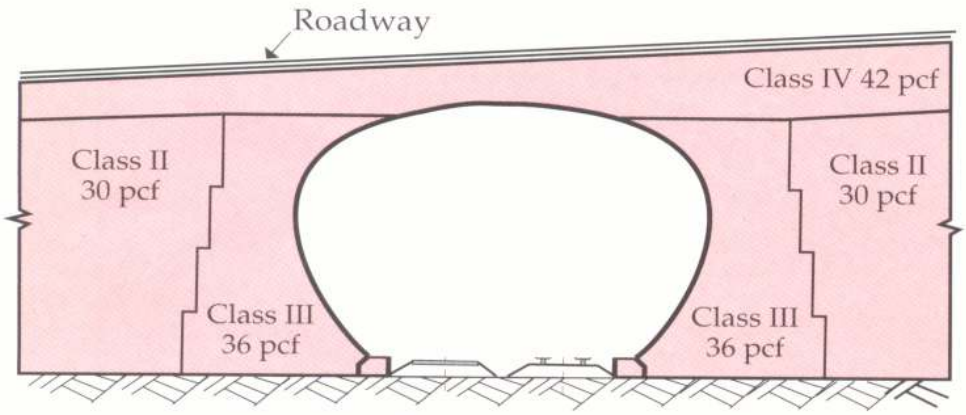
A severely deteriorated bridge structure servicing a steel plant was in need of immediate replacement. However, plant access had to remain available both over the bridge (trucks) and under the bridge (trains) throughout construction. The site is underlain by poor soils and extensive foundation work would have been necessary if a new bridge structure was built.

A combination system of a multi-plate corrugated steel arch culvert with **ELASTIZELL EF** solved all of the site problems at a lower cost and proved to be faster than the scheduled time for a conventional bridge structure. The multi-plate arch culvert required only a simple footing and was erected quickly without blocking the rail access.

The low density (30 pcf) properties of **ELASTIZELL EF** reduced the load on the poor underlying soil, reduced the deflection and deformation of the arch structure, and in fact, provided increased lateral support of the arch. This solution has zero maintenance when compared to a bridge structure. The construction schedule was met despite early winter conditions and at a significant cost savings compared to a bridge structure.



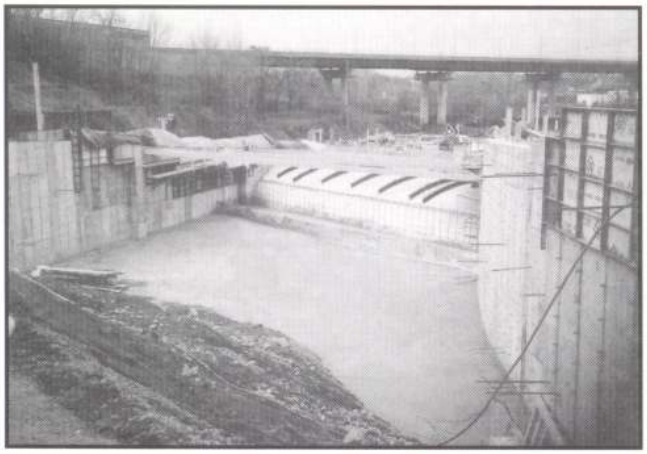




TYPICAL SECTION
(not to scale)

Note: **ELASTIZELL EF** at different densities and strengths for various portions of this solution

ELASTIZEL EF (Engineered Fill) Geotechnical Applications



Casting ELASTIZELL EF in lifts around the Multi-Plate Arch Culvert

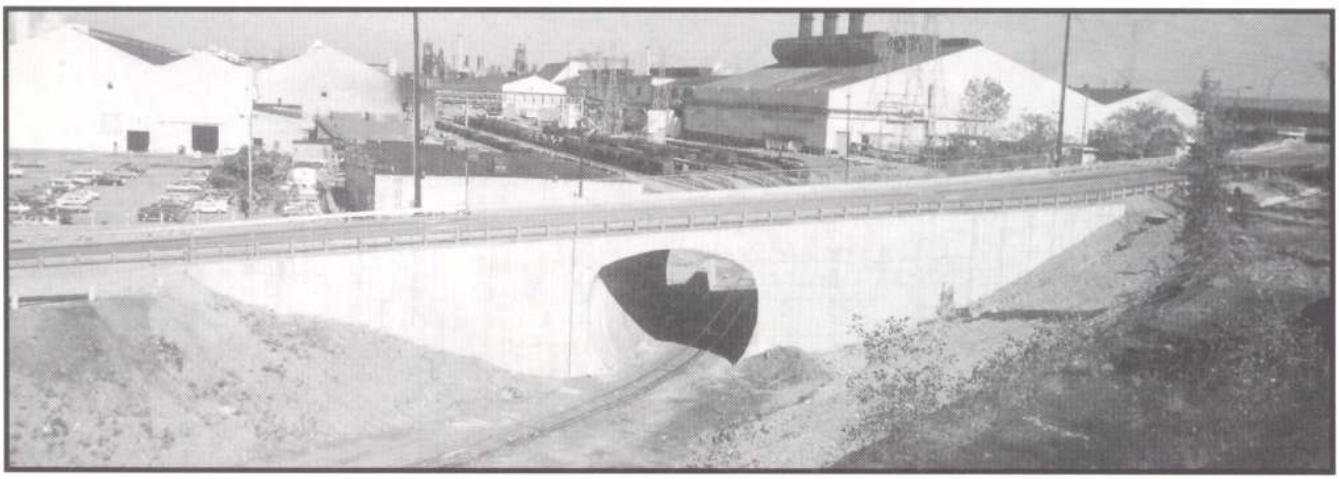
- **ELASTIZELL EF** is a feasible solution for these repairs without disrupting the path of railways, roads, or natural obstructions such as rivers and drainage ditches.
- **ELASTIZELL EF** is designed for the specific site and soil conditions of each project.
- **ELASTIZELL EF** is customized with different strengths and densities as required by the structural action of the arch.
- **ELASTIZELL EF** is a non-toxic material which poses no harm to the environment.

ELASTIZELL EF & Culverts vs. Bridges

- First cost and maintenance costs are low.
- The **ELASTIZELL EF** solution provides a finished product in weeks while a structural bridge requires many months for completion.
- **ELASTIZELL EF** does not require piling, thus minimal excavation is needed. The existing ground conditions are not disturbed.
- **ELASTIZELL EF** requires significantly less maintenance than a bridge structure.
- **ELASTIZELL EF** is easily excavated with out disturbing the culvert structure.
- **ELASTIZELL EF** provides a controlled surface for a conventional roadway.

ELASTIZELL EF vs. Conventional Fill

- **ELASTIZELL EF** is a load reducing material for use over poor soils. Example: For each 1' of existing soil removed, 4' of **ELASTIZELL EF** may be added without increasing the load.
- **ELASTIZELL EF** flows easily into all spaces eliminating potential voids.
- Conventional backfills require multiple layers of compaction during installation which may cause unacceptable deformation of the steel culvert resulting in high stress levels and possible failure.
- **ELASTIZELL EF** flowability permits more variability in choice of culvert shape and size.



Completed Solution