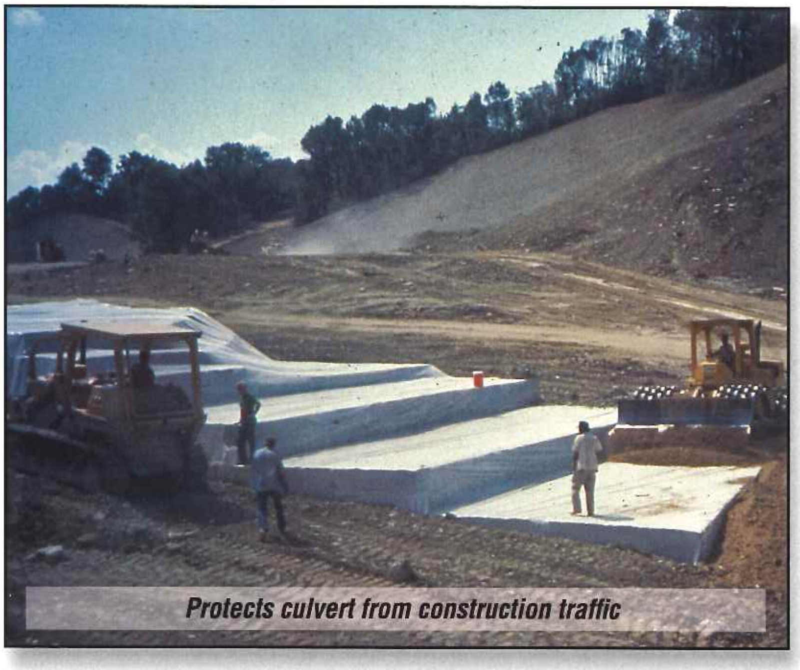
Elastizell EF Prevents Overloading of an Underground Structure



Protects culvert from construction traffic

Ability to increase grade without overloading existing structure

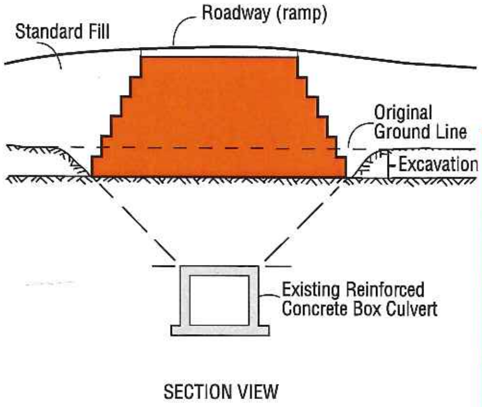
Problem

A two ramp interchange needed to be built for an Interstate Highway. A portion of the new ramp was over an underground culvert structure that could not support additional loads. What is the most economical method to construct these exit/entrance ramps over the existing culvert?

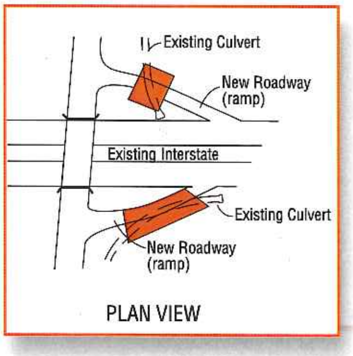
Discussion

The conventional construction methods of soil fill and compaction would overload and damage the existing culvert.

Strengthening the culvert would require sheeting the excavation around the culvert, excavating a great quantity of fill material, demolishing the box culvert, forming and casting a new culvert. Then finishing construction by adding numerous layers of fill up to the new ramp height with great deal of compaction for each new layer.



SECTION VIEW



PLAN VIEW

= ELASTIZELL EF

Solution

After a value engineering study, it was determined that the most economical solution was to load balance using Elastizell EF. Excavation quantities were determined at the critical section so that the necessary quantities of Elastizell EF would bring the ramp to proper grade without overloading the box culvert.

The desired fill area was formed and the Elastizell EF was pumped into place. This prevented any overloading of the culvert during construction when it was the most susceptible to damage.

Advantages

- *The low density Elastizell EF permits a 4 to 1 increase in fill depth to existing fill removal by load balancing.*
- *Minimal excavation creates less runoff and faster construction.*
- *Culvert kept intact so no need for supplemental drainage system during construction.*
- *The speed of Elastizell EF solution will result in faster project completion.*
- *Elastizell EF is self consolidating and requires no compaction.*

BASIC PHYSICAL PROPERTIES

Elastizell EF

*Greater values may be obtained if required per Elastizell Corporation design.

CLASS	MAXIMUM CAST DENSITY pcf (kg/m³)	MINIMUM COMPRESSIVE STRENGTH* psi (Mpa)	ULTIMATE BEARING CAPACITY Tons/sf (kN/m²)
I	24 (384)	10 (0.07)	0.7 (69)
II	30 (480)	40 (0.28)	2.9 (276)
III	36 (576)	80 (0.55)	5.8 (552)
IV	42 (672)	120 (0.83)	8.6 (827)
V	50 (800)	160 (1.10)	11.5 (1103)
VI	80 (1280)	300 (2.07)	21.6 (2068)

Comparison of Maximum Fill Material Densities

ELASTIZELL EF

Class I	24 pcf (384 kg/m³)	Water	62.4 pcf (1000 kg/m³)
Class II	30 pcf (480 kg/m³)	Lightweight Aggregates	60-90 pcf (961-1442 kg/m³)
Class III	36 pcf (576 kg/m³)	Flowable Fills	90+ pcf (1442+ kg/m³)
Class IV	42 pcf (672 kg/m³)	Soils	120 pcf (1922 kg/m³)
Class V	50 pcf (800 kg/m³)	Aggregates, Asphalts	125 pcf (2002 kg/m³)
Class VI	80 pcf (1280 kg/m³)	Lean Concrete	145 pcf (2323 kg/m³)

For specific design values and more detailed specifications, as well as design assistance, please contact the ELASTIZELL CORPORATION OF AMERICA or our local applicator below.

Elastizell Cellular Concrete

ENGINEERED FILL

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