Elastizell EF Permits Efficient Construction Over Culverts

Ability to keep existing infrastructure

Culvert to be further backfilled and covered with Elastizell EF.

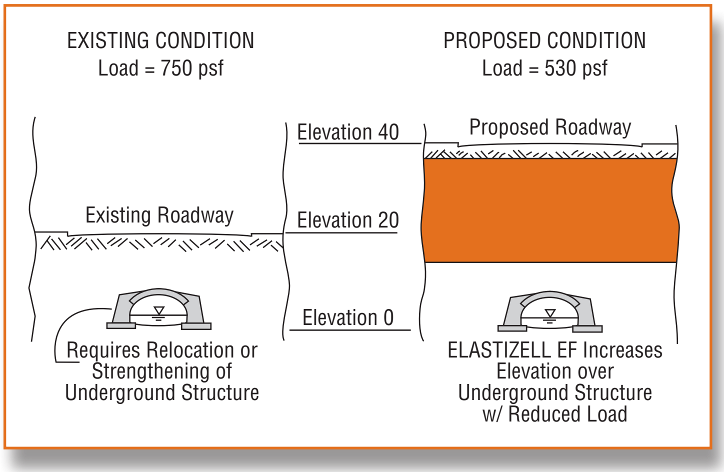
Problem

A roadway grade needed to be raised to accommodate a new transportation system (shown in figure below). A portion of the roadway was over an underground culvert structure that was unable to carry additional loads. How can the increased elevation be achieved at a minimal cost without overloading this structure?

Discussion

If the culvert section were to be diverted, reconstructed and reconnected, a delay would occur at an additional cost of millions of dollars. The major concern in this type of situation is what happens to the existing culvert structure.

A portion of the soil above the existing culvert could be removed and replaced with a lower density material. The net effect of this balanced switch would be zero additional load on the culvert.



= ELASTIZELL EF

Solution

In this case, existing soil was removed to just above the ground water table. The soil removed averaged 8 feet in depth. Then Elastizell EF was cast in thicknesses ranging from 8 to 23 feet along the 600 foot project length. At the sections where the Elastizell EF was 23 feet thick, the load on the culvert structure was approximately 2/3 of the original 8 feet of soil. The new roadway was placed on the Elastizell EF.

The Elastizell EF load balancing approach was much less costly and less time consuming than special underground foundation and structure work designed to carry the additional loads of heavier fill.

Advantages

- *Alternate solutions would have a high probability of damaging underground structures.*
- *Elastizell EF is flowable and fits irregularly shaped culverts.*
- *The low density Elastizell EF permits approximately a 4 foot fill depth for each foot of existing soil removed.*
- *Reduced construction timeline.*

BASIC PHYSICAL PROPERTIES

Elastizell EF

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

CLASS	MAXIMUM CAST DENSITY pcf (kg/m^3)	MINIMUM COMPRESSIVE STRENGTH* psi (Mpa)	ULTIMATE BEARING CAPACITY Tons/sf (kN/m^2)
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/m^3)
Class II	30 pcf (480 kg/m^3)
Class III	36 pcf (576 kg/m^3)
Class IV	42 pcf (672 kg/m^3)
Class V	50 pcf (800 kg/m^3)
Class VI	80 pcf (1280 kg/m^3)

Water	62.4 pcf (1000 kg/m^3)
Lightweight Aggregates	60-90 pcf (961-1442 kg/m^3)
Flowable Fills	90+ pcf (1442+ kg/m^3)
Soils	120 pcf (1922 kg/m^3)
Aggregates, Asphalts	125 pcf (2002 kg/m^3)
Lean Concrete	145 pcf (2323 kg/m^3)

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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