

Alchatek

CASE STUDY
VOID FILL

BOX CULVERT / PRECAST CONCRETE SLABS UTAH

DOT Culvert *Void Fill*

A Utah-based geotech specialist partnered with a general contractor to address a critical DOT infrastructure challenge involving the replacement of an existing culvert on a major roadway in Utah.

STRUCTURAL FOAM USED
400 *lbs*

PRODUCT
AP Lift 440

I · THE PROBLEM

CASE STUDY · 01

01 What made this job *difficult.*

BOX CULVERT / PRECAST CONCRETE SLABS UTAH

The project involved the installation of precast concrete slabs on both sides of the box culvert, designed to create a seamless transition from the culvert to the compacted road base. During the design phase, engineers identified that constructing a compacted road base beneath the slab would inevitably leave voids underneath. These voids posed a risk of uneven support and potential rocking of the slab when subjected to heavy traffic load.

THE CONSTRAINT

Zero movement

SLABS HAD TO STAY AT GRADE

Voids had to be filled beneath the precast slabs on a major Utah roadway without lifting or shifting them. Dial indicators monitored the slabs throughout injection, and the work had to finish with minimal disruption to traffic.

KEY CONDITION

Voids beneath precast slabs risked uneven support and rocking under heavy traffic load.

FOUND IN DESIGN

Engineers identified that constructing a compacted road base beneath the slab would inevitably leave voids underneath.

02 What was specified, *and how it went in.*

AP LIFT 440

To address this, ¾” holes were drilled four feet apart to allow for injection rods to be inserted through the slab. The foam selected for this slab was AP Lift 440 structural foam due to its rapid expansion and high strength needed for DOT projects. This foam expands 17-19 times its original volume within 8-10 seconds of injection, ensuring comprehensive void filling. Dial indicators were used to ensure that there was no vertical movement of the slab during the injection process.

THE MATERIAL

AP Lift 440

AP LIFT 440

Compressive Strength 80 p.s.i. (11,520 p.s.f); Tensile Strength 90 p.s.i.; Expansion 17-19 times unconfined; Density 3.75 to 4.25 lb/ft3; Shrinkage negligible. Properties will vary depending on application conditions.

THE METHOD

01	02	03	04
Drill	**Inject**	**Monitor**	**Complete**
¾” holes drilled four feet apart to allow injection rods to be inserted through the slab.	AP Lift 440 structural foam injected through the rods, expanding 17-19 times its original volume within 8-10 seconds.	Dial indicators used to ensure no vertical movement of the slab during injection.	Operation executed in approximately three hours, utilizing about 400 lbs of structural foam.

WHY AP LIFT 440

Rapid expansion and the high strength needed for DOT projects.

It expands 17-19 times its original volume within 8-10 seconds of injection, ensuring comprehensive void filling.

NO SLAB MOVEMENT

Dial indicators confirmed there was no vertical movement of the slab during injection.

03 What the result was, *and what confirmed it.*

STRUCTURAL FOAM USED

The entire operation was executed in approximately three hours, utilizing about 400 lbs of structural foam. This successful application filled all of the voids, providing uniform support for the precast slabs and enhancing overall road stability. The rapid curing properties of the foam allowed for swift project completion with minimal disruption to traffic.

STRUCTURAL FOAM USED

400 *lbs*

Voids filled, providing uniform support for precast slabs and enhancing overall road stability with minimal traffic disruption.

AT A GLANCE

3/4 inch HOLE DIAMETER	4 ft HOLE SPACING	17-19 times EXPANSION unconfined expansion within 8-10 seconds	3 hours OPERATION DURATION

MINIMAL DISRUPTION

The foam's rapid curing allowed swift completion with minimal disruption to traffic.

The entire operation was executed in approximately three hours.

START THE CONVERSATION

Send us the job.
We will send back an approach.

Send us the soil report or the failure photos and Technical Services will return a written approach within two business days.

TECH SUPPORT

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Alchatek

Alchatek manufactures polyurethane resins, chemical grouts, and injection equipment for infrastructure repair: leak sealing, soil stabilization, concrete lifting, and seawall repair. Headquarters in Tucker, Georgia, with a bonded warehouse in Reno, Nevada.

Information in this document is believed accurate at the date of publication. Product performance depends on site conditions and application; consult the current Technical Data Sheet, which is the controlling document.