

Prestressed concrete pavement overlay I-35 - USA



Post-tensioning system applied to concrete pavement in Texas.



▲ *The prestressed concrete pavement preparation*

Located on Interstate 35 in McLennan County, Texas, the 200,000-square-foot prestressed concrete pavement overlay consists of two adjacent strips of 17 and 21 feet placed on visqueen bond breaker over an existing concrete pavement. There are nine 240-foot-long slabs and seven 440-foot-long slabs, making a total project length of one mile.

The new slabs were tied to the pavement below by a continuous transverse recess measuring three feet wide and two inches deep located in the middle of each slab to allow for elastic shortening at both ends. The transverse end joints consist of

special armor angles anchored with Nelson deformed bars and stainless steel dowels. Typical bridge expansion joint material provides cover for the gap between slabs. The expansion joint is perpendicular to the pavement and allows for the predicted thermal expansion movement of up to three inches.

The anchorages for the longitudinal VSL Monostrand Post-Tensioning System were bolted to the armor joints to prevent the angles from breaking loose due to traffic vibrations and to provide compression to the end of the slab. Tendon halves were stressed simultaneously from the staggered stressing



▲ **Concrete Pour:** *A large concrete finishing machine was employed to distribute the concrete evenly, vibrate the pour and finish it.*

Scope of works performed

- Supply and installation of VSL P-T System.

blockouts in the slab center with a special stressing anchorage. To eliminate shrinkage cracks, first-stage stressing was conducted not later than eight hours after the concrete pour when the concrete had reached a compressive strength between 1,400 psi and 2,300 psi. Final stressing was performed 48 hours after the concrete pour. The final longitudinal average compression was 200 psi.

To allow for some relative movement between the pours due to elastic shortening induced by

the post-tensioning, an asphaltic coating was applied to the longitudinal joint between the 17- and 21-foot-long strips. Loop transverse post-tensioning introduced 50 psi transverse compression and tied the two strips together.

Quantities:

Overlay Area:	200,000 sq. ft.
Concrete:	3,690 cu. yd.
Reinforcing Steel:	None except for tendon supports
Prestressing Steel:	39 tons
Contract Amount:	\$1,200,000

OWNER
Texas State Department of Highways and Public Transportation

STRUCTURAL ENGINEER
SDHPT, UT Austin advise (test project)

GENERAL CONTRACTOR
APAC, Texas Bitulithic Company, Dallas, Texas

PT SUBCONTRACTOR
VSL Corporation



▲ **Stressing Blockouts:** The stressing blockouts were staggered along the center of each slab. Early stage stressing at concrete strength between 1,400 psi and 2,300 psi eliminated surface shrinkage cracks. Final stressing was performed 48 hours after concrete pour.

◀ **Armor Angles:** The transverse joints consisted of the armor angles anchored with Nelson deformed bars and stainless steel dowels. The post-tensioning anchorages were bolted to the armor angles in order to prevent traffic vibration damage.



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