



## Emergency Vehicle Operator Course

<b>Location:</b>	Camp Ripley at Little Falls, MN
<b>Submitted by:</b>	AMSYSCO, Inc.
<b>Owner:</b>	U.S. Army
<b>Architect(s):</b>	URS
<b>Engineer(s):</b>	URS
<b>Contractor:</b>	Donlar Construction
<b>PT Supplier:</b>	AMSYSCO, Inc.
<b>Other Contributors:</b>	Pawan Gupta

### Project Overview:

The Emergency Vehicle Operator Course (EVOC) is a unique post-tensioned concrete slab-on-ground constructed for the Minnesota Department of Military Affairs at Camp Ripley. EVOC is a 60,000 ft<sup>2</sup> "skid pan" that is made slippery so that vehicle drivers can practice controlling skids. EVOC consists of a 12.5 in. thick concrete slab with 20 in. grade beams around the perimeter. The post-tensioned slab used 6000 psi shrinkage-compensating concrete that was laid on top of two layers of 6 mil thick polyethylene sheet and a 14 in. base course. Additionally, it was separated from an asphaltic "transition" slab by a perimeter expansion joint.

Unlike most post-tensioned concrete slabs of similar square footage, EVOC had two pours of 30,000 ft<sup>2</sup> pours each, which were poured on consecutive days. Initial stressing was done at  $0.4F_{pu}$  (or 16.5 kip) when the concrete in Pour #2 reached 1500 psi. Final stressing was done at  $0.8F_{pu}$  (or 33 kip) when the concrete reached 3000 psi in both pours. Each 0.5 in. diameter 270 ksi tendon was stressed from both ends to increase the final average force in the tendon. In total, EVOC has 190 bundles of two unbonded tendons spaced at 1 to 7 in. on center in the short 200 ft direction and 150 bundles of two unbonded tendons spaced at 16 in. on center in the long 300 ft direction.

Because the concrete slab would be exposed to aggressive environments from inclement Minnesota weather and test chemicals, the project documents required an encapsulated post-tensioning system of PTI specifications. This should help increase the durability of the concrete and improve life-cycle costs.

### Jury Comments:

- A good example of the use of post-tensioning to improve crack control for an exposed slab, which reduces the penetration of water and other liquid chemicals.
- The use of post-tensioning also eliminated control joints that could curl or crack over time.