



Terraspan® GRS Arch

OWNER	District of Chetwynd
ENGINEER	Terratech Consulting Ltd.
CONSULTANTS	Urban-Systems Ltd.
INSTALLER	Landmark Solutions Ltd.
LOCATION	Chetwynd, BC

Chetwynd is located in the foothills of the eastern slope of the Rocky Mountains. Located at the junction of Highways 97, 29 and the Canadian National Railway mainline, Chetwynd is the natural transportation hub of the mighty Peace River area.



During the summer of 2011, the Peace Region of British Columbia experienced abnormally large rainfall volumes over a 48 hour period-up to 150mm in some areas. During this storm event, a Structural Plate arch that carries Widmark Creek under 46th Street washed out, closing 1 of 2 access points to the District of Chetwynd industrial park. The District needed to restore access to the industrial park as rapidly as possible in order to prevent loss of revenue for its many clients.

Based on partnering history, Urban-Systems Ltd. contacted Armtec while developing the preliminary design for a replacement structure with concrete footings. Armtec quoted within the requested budget price and suggested they use a Terraspan® GRS Arch™ instead of a conventional arch structure.

Conventional soil-steel structures consist of a steel shell supported on rigid footings surrounded by a compacted backfill envelope—load is transferred into the shell in the form of ring compression and directed into the concrete footings below.

“[Landmark] told us two weeks, and they worked hard to achieve that goal.”

Paul Gordon, Deputy Director of Engineering and Public Works District of Chetwynd

The GRS (Geosynthetic Reinforced Soil) design employs tightly spaced layers of woven geotextile within the compacted soil envelope—the composite effect of the soil - geotextile combination dramatically increases stiffness of the backfill soil envelope, and decreases load transfer to the steel arch. Field experience shows the shell acts as a type of formwork during construction to aid in promoting soil arching. Instead of load being supported by the steel shell, it is transferred to the reinforced soil and eliminates the need for time consuming, costly footings.

Urban-Systems Ltd. chose the Terraspan® GRS Arch™ because it maintained the existing right-of-way and also a low profile with a large hydraulic capacity. The owner was pleased by the lower long-term maintenance costs of this arch versus a bridge installation.

In order to fast track the installation, the contract was directly awarded to Landmark Solutions Ltd. out of Salmon Arm, British Columbia. Landmark Solutions specializes in GRS construction, having installed dozens

of structures in both British Columbia and Alberta. The demolition of the existing structure started October 31, and the Terraspan® GRS Arch™ materials (including the Bridge-Plate shell, welded wire mesh wall forms and woven geotextiles) were delivered by Armtec on November 3, 2011. Installation of the buried watermain, preparation of the streambed and foundation, and final installation of arch was completed in exactly two weeks.



The foundation and streambed are prepared prior to arch placement.



The road re-opened 14 days after construction started.



Armtec is a leading national manufacturer of a comprehensive range of infrastructure products and engineered construction solutions for customers in a diverse cross-section of industries. With operations coast to coast, we are a trusted partner for transportation, public works, forestry, oil and gas, and mining operations throughout the country and abroad. Since 1908 our commitment to quality, customer service and innovation has set the benchmark in the Canadian drainage and bridge landscape.

Call 1-800-565-1152 or visit armtec.com