

# CASE STUDY

## GEOTEX® 4X4 SOLVES CONSTRUCTION CHALLENGES IN WASHINGTON STATE



### BACKGROUND

State Route 99, running north and south, connects the southern suburbs of Washington State to Seattle. The road is heavily traveled by locals trying to avoid the congestion of Interstate 5 near the Boeing plants. The Washington Department of Transportation (WA DOT) was called to address a situation involving a four-lane timber structure bridge not capable of handling the traffic flow along this route. Because more lanes were needed, the DOT decided to build two new bridges.

### PROBLEMS

Their main concern was maintaining traffic flow during construction. The decision made by the DOT involved building the first bridge adjacent to the existing structure and allowing traffic to continue on the timber bridge. Because the bridge had to be built so close to the existing structure, it was necessary to construct a wrapped-face temporary retaining wall using a high strength geotextile. The retaining wall was built to support the weight of the road during construction. In the final phase of construction, when both bridges are complete, the area between the bridges will be filled in and the wrapped-face retaining wall will have served its purpose.

### SOLUTION

Due to tight right-of-way conditions, the DOT selected a geotextile wrapped-face retaining wall rather than a slope. This versatile solution was also chosen for its cost efficiency in allowing for complicated scheduling and construction conditions to be handled quickly and effectively.

Atkinson Construction Co., at the suggestion of Northwest Linings & Geotextile Products, submitted Propex Geosynthetics' Geotex® 4x4 high performance woven reinforcement geotextile to the WA DOT for consideration. After thorough testing and review by their HQ Materials Laboratory, Geotex 4x4 was approved for use in

AFTER THOROUGH TESTING AND REVIEW BY WASHINGTON DOT, PROPEX GEOTEX® 4X4 WAS APPROVED FOR USE IN ALL WALL SECTIONS ON BOTH THE BRIDGE APPROACH AND THE FOUNDATION PRELOAD WALL.

### PROJECT FILE

PROJECT ▶ WASHINGTON HIGHWAYS

PRODUCT ▶ GEOTEX® HIGH STRENGTH 4X4

APPLICATION ▶ RETAINING WALLS

DESIGNER ▶ WADOT

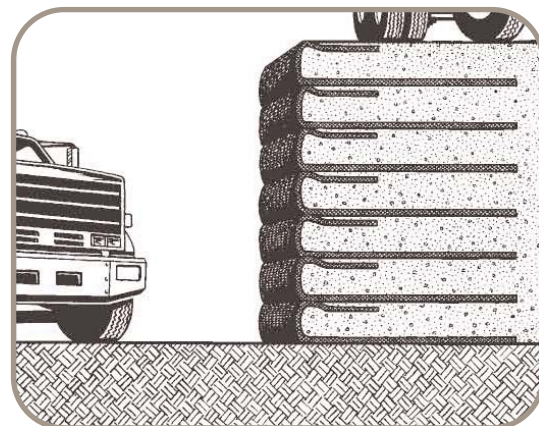
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# CASE STUDY CONTINUED

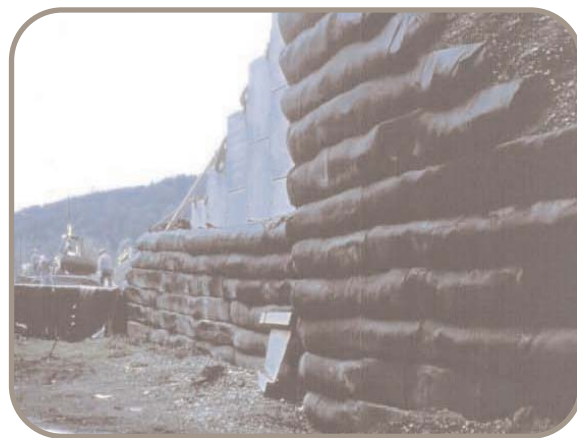
all wall sections on both the bridge approach and the foundation preload wall. Geotex high performance woven geotextiles are designed for soil reinforcement. The heavy individual yarns are woven into a unique twill pattern forming a durable geotextile with superior hydraulic characteristics. These properties are ideal for the reinforcement of soft soils, steepened slopes, retaining walls, lagoon closures and lining support systems. Manufactured at one of Propex's ISO 9002 facilities, Geotex products are tested and inspected in quality control laboratories accredited by the GAI-LAP (Geosynthetic Accreditation Institute's Laboratory Accreditation Program) before shipment.

## CONSTRUCTION

Since the two phases were scheduled back-to-back, geotextile-reinforced wrapped-face retaining walls and surcharge fills were utilized. This improved the coordination of the two phases. Because of the tight right-of-way, the first phase required the construction of a temporary retaining wall approximately 1200 ft (370m) long and 25 ft (7.6 m) high. The area was first graded and smoothed, removing any rocks or debris. Temporary forms were then placed in front of the wall, forming the vertical face of the wall. Next, the first layer of Geotex 4x4 was placed as detailed in the project drawings. Small vibrating rollers were used to compact the soil. Once backfill was placed to the height required by the design, the geotextile was laid over the compacted soil, the forms were removed and reset. The sequence was then repeated until the wall reached its design height.



This illustration depicts a properly installed wrapped-face wall.



Complete wrapped-face wall with concrete panels in place.