



Firestone GeoGard™ EPDM membrane provides Cost-Effective Solution for Irrigation Canal



The Greenfield Irrigation District in Fairfield, Montana provides much needed water to area farmers, whose crops would otherwise suffer due to the region's lack of rain. After losing water in earthen and cracked, concrete canals, the district decided to rehabilitate an 8,21 km section of canal.

This rehabilitated stretch, referred to as GM47-11, serves several hundred acres of land and supplies water to Freezeout Lake, which is owned by the Montana Fish, Wildlife and Parks Department.

The GM47-11 project was funded in part by a grant from the Natural Resources Conservation Service. To abide by NRCS regulations, the landowners hired a technical service provider (TSP) to serve as a private engineer. After careful consideration, the TSP specified 1,1 mm Firestone GeoGard™ EPDM for the project's lining material.

While durability, life expectancy, warranty, expansion and contraction characteristics, and puncture resistance were all considerations in the liner selection, cost was the overriding factor.

Quick Facts

Project scope:

- Rehabilitate a 8,21 km sub-lateral branch of canal
- Maintain the canal's service to area's local farms
- Ensure the source water reaches farm and a local lake

Challenges faced:

- Abide by regulations of Natural Resources Conservation Service (NRCS)
- Battle high winds, permeable soil and high water tables during installation
- Accommodate water flows of up to 0,85 m³/sec

Solutions:

- Excavate 1 m - 1,2 m deep and 7,50 m - 9 m wide
- Install 74.300 m² of 1,1 mm Firestone GeoGard™ EPDM
- Install cross trenches and cleanouts at intervals along the canal



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"We are a non-profit organization and this is a tax-based project," commented Bob Hardin, manager of the Greenfield Irrigation District. "The cost of concrete has escalated. Products like Firestone GeoGard™ EPDM are the most cost-effective solution for this type of project, especially given the material's life expectancy."

Irrigation district personnel served as the installers. Once they excavated the canal, a geotextile was laid into the bed. Next, the 9,15 m wide by 61,00 m long EPDM panels were unrolled down the center of the canal and unfolded up the sides. The panels were seamed together using Firestone's QuickSeam™ Tape System. The edges of the liner were then placed into an anchor trench and covered with dirt to secure them.

Experienced in this type of application, the Firestone representative recommended an additional step: installing cross trenches and cleanouts at regular intervals down the length of the canal. "Firestone suggested we do this because of the sheer length of the channel and the force at which water travels through it", Hardin stated. "The cross trenches more firmly anchor the membrane and serve as a means for maintaining a consistent flow during heavy rain or thawing events."

The cross trenches were prepared by digging across the canal at 152 m intervals. Each trench is 0,60 m deep by 1,20 m. The liner was placed across the trenches and anchored into place with large rocks.

Everyone involved with the Greenfield project is pleased with the results. "There is no doubt in my mind that this is the easiest and most cost-effective way to line a canal and conserve water," Hardin said. "We will definitely be lining additional sections of the canal network with Firestone GeoGard™ EPDM."



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