

CASE STUDY



This case study concerns a particular canal system in Colorado where shotcrete is widely practiced to reinforce weak banks that are susceptible to serious and rapid erosion if not protected.

Problem

Simply put, areas of shotcreting had failed on this major Colorado canal. Water is incompressible so it directly varying pressures on canals walls. Shotcrete is not flexible, so any weakness in the applied protection coat, rapidly causes cracking.

Even small cracks are vulnerable to water ingress, causing pressure behind the rigid coating, expansion of the cracks and often complete failure with a large hole opening up. Water movement, and its scouring effect, can rapidly escalate into a portion of bank failing entirely resulting in expensive remedial work being required.

Solution

Castagra's SG1 has nearly triple the adhesion of common epoxy coatings and is highly adhesive to concrete. Nearly 25 years of submersion in saltwater have shown no measurable deterioration and its widespread use in well over a thousand frac oil and production water tanks has demonstrated its resilience to harsh chemicals and extremes of weather and mechanical shock, as in the case of mobile tanks.



Being VOC-free, BPA-free, non-toxic, and ANSI/NSF-61 rated for contact with drinking water, it is ideal for applications where water is involved and that which can potentially enter sensitive water tables. It is made from renewable castor oil and natural gypsum soft rock.

In this case study, a test patch of Castagra's SG1 with geotechnical membrane (fiberglass), had been applied to a previously damaged shotcrete area of the canal 12 months previously. Inspection at the time of the new remedial work, showed it was in perfect condition.

The latest repair work used the same technique as previously applied, including the use of large staples to help it all hold onto the soil substrate. The target area was dried as much as was practicable, Castagra's SG1 was applied over a 4ft. by 4ft. area, and the membrane was immediately pressed into place on the coating. A further coat of SG1 was then applied to completely saturate the membrane.

Application Results

Elite Protective Coatings reported that the year-old test patch proved that shotcrete and straight concrete canal walling can be easily and completely protected by the combination of Castagra's SG1 and geotechnical membrane for extra strength.

Elite's owner, Jon Goza, said "We were particularly pleased with the year-long test and its highly satisfactory results. It is Castagra's unique levels of adhesion, robustness, longevity and zero toxicity, that makes it the ideal solution for protective work where water and extreme conditions are concerned as well as clients seeking the best possible green solution combined with low cost."