

Enkamat® R²M

DIVISION 2
Site Construction

Trapezoidal Channel

Contractor:

Valley Coast Landscape
Construction, Inc.
San Diego, CA

Engineer:

P&D Consultants
Orange, CA

Distributor:

White Cap Industries, Inc.
Santa Ana, CA



LaRonda channel after vegetation is established.

R²M Technology Solves Soil Erosion Problem in California City

Rural counties, as well as cities and urban communities continue to face problems with soil erosion along stream banks, shorelines, tributaries, and creeks. In addition to the erosion problems, they are also facing the effect of chemical constituents within the water from runoff of agriculture, recreation areas, and residential areas that apply fertilization to their crops, plants, and vegetation. This problem is particularly increasing within areas of concentrated or dense development.

The City of San Juan Capistrano, located in Southern California, was facing such a situation with a channel built in the 1960's that was severely eroding and undercutting the concrete side slopes - causing sediment to be transported to the San Juan Creek basin that drains directly into the Pacific Ocean. The City's objectives for rehabilitating the channel were: minimize erosion during precipitation events, increase aesthetics along the channel, minimize long term maintenance issues, reduce chemical particulate matter from the residential runoff water,

and minimize construction and maintenance costs. City engineers called P&D Consultants, an environmental planning and engineering firm in Orange, California to study the problem, provide recommendations, and submit a design to repair the channel while meeting their objectives. P&D reviewed many options including conventional rip rap, Reno mattresses, concrete, and TRMs (turf reinforcement mats.)

P&D began their assessment by calculating the flow of water within the localized tributary flowing directly into the channel. The existing channel collects runoff from over 300 acres. The area is within a valley with hillsides over 200 ft. high. Storm drains from the existing development discharge directly into the channel. The initial flow of water entering the channel is from a 10' x 4' concrete box culvert. The 1700 ft. long trapezoidal channel measured 4 ft. deep with a 10 ft. bottom and side slopes of 1.5:1. The estimated flow rate of the channel was 500 cfs. This type of flow generates a

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shear force on the channel bottom of approximately 4.5 psf for an extreme storm event.



never unravel or lose its structural integrity both during and after installation - aquatic life within the basin would never be endangered from loose synthetic fibers floating downstream.

Valley Coast Landscape suggested a mulch be applied on top of the Enkamat to ensure rapid germination, minimize seed displacement, and aid the establishment of mature vegetation. The overall cost of using the Enkamat and mulch layer provided considerable savings compared to other erosion control alternatives.

After reviewing all of the options, P&D and San Juan Capistrano representatives determined that a root reinforcement matrix would be the best solution to meet the project requirements. A meeting was held with city officials, Valley Coast Landscape, and Colbond Geosynthetics to determine the most effective construction and installation methods for the channel. Low growth vegetation that would require little or no maintenance and remove pollutants from the water prior to discharge into the basin was also selected at this time. A discussion took place about which root reinforcement matrix would not restrict vegetation growth and still meet the required flow conditions of the channel.

Colbond Geosynthetics' engineers reviewed all the information and recommended using Enkamat R²M.



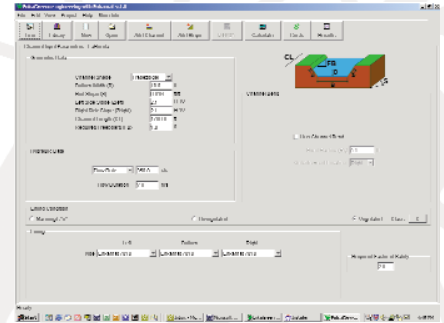
Enkamat is a three-dimensional, root reinforcement matrix that is sufficiently open to eliminate vegetation restriction. It is made from nylon, which will not float like polypropylene. Enkamat keeps the vegetation and soil from eroding during extreme hydraulic flow conditions. City officials and P&D also liked the fact that Enkamat would

“Choosing Enkamat for the rehab of the channel saved considerably over traditional methods of reconstruction and provided an environmentally friendly solution to the existing erosion problem. Rip rap would have cost an additional 15 - 20% and concrete about 40%. With these savings we were able to armor more of the channel - not to mention nearby homeowners were extremely satisfied with our solution. Adding native plants to the channel was much more pleasing to the eye than concrete or rip rap.” said Richard Wilson of P&D Consultants.

Once construction began, the project was completed in two weeks. Valley Coast Landscape was very satisfied with how conformable the Enkamat R²M was during installation and that the product didn't unravel or lose its structural integrity (reduction in performance) when cut in the field during installation. TRM's they have used in the past have tended to unravel upon arrival at the job site and during installation, making them more difficult for crews to work with. These same TRMs lose their fibers when cut, compromising the integrity of the product and causing environmental concerns when loose fibers migrate into ecological systems.

Since the installation, several 25 year storm events have occurred in this area. Both the channel and vegetation have not been damaged - even during peak rainfall and hydraulic activity. City officials in San Juan Capistrano are very pleased with the success of the project and that all of the federal and state requirements of the Phase II

Rules of the NPDES (EPA's National Pollutant Discharge Elimination System) were met.



EnkaGreen e-engineering with Enkamat design software was used to verify the engineer's calculations.

Eco Channels provide many benefits to your environment:

- Minimizes Sediment Loss
- Filters Pollutants
- Increases Aquatic Life
- Stimulates Oxygen Production
- Enhances Cooling Effect
- Creates Recreation Areas
- Beautifies your Surroundings

For more information about Enkamat R²M and other quality products manufactured and marketed by Colbond, Inc. please call our toll free number or visit our website.

COLBOND GEOSYNTHETICS

1301 Sand Hill Road
P.O. Box 1057
Enka, N.C. 28728
Tel. (+1) 828-665-5050
Toll Free: (+1) 800-365-7391
Fax (+1) 828-665-5009
EnkaTech Fax Back (+1) 888-288-2132
email: enka-engineered@colbond.com
website: www.colbond-usa.com