CASE HISTORY

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ABUTMENT PROTECTION WORKS USING TECHFAB METAL GABIONS & MATTRESS ALONG SABARMATI RIVER AT PALDI, GUJARAT

PALDI, GUJARAT, INDIA

River Training Works

Client:	Products used:
PWD KHAMBHAT	• TECHFAB METAL GABION & MATTRESS • TECHGEO PR 20
Main contractors:	
KHUSHI INFRASTRUCTURE PVT LTD.	
Manufacturer & Supplier:	Year of Construction:
TECHFAB (INDIA) INDUSTRIES LTD.	2023

Project brief & Problem Description:

Paldi, situated along the Sabarmati River Coast in the Ahmedabad district of Gujarat, faced substantial challenges due to the continuous and forceful flow of Sabarmati River. The Paldi Abutment was susceptible to erosion, weathering, and scouring necessitating urgent intervention. The relentless flow of the river not only compromised the stability of the abutment but also posed potential threats to the surrounding environment, including the adjacent flood plains.

In response to these challenges, the Abutment Protection Works was initiated, focusing on the development of a robust protection system. The conventional erosion protection methods proved inadequate against high flow velocities and turbulence. Balancing the need for environmentally friendly solutions with the primary goal of bank stabilization is essential.

Challenges :

Erosion, weathering, and scouring pose constant threats, necessitating a solution capable of withstanding high flow velocities and turbulence. Achieving an environmentally acceptable protection system while ensuring effective bank stabilization adds complexity to the project. Striking the right balance between ecological considerations and structural stability is a key challenge.

Photo 1 : During Construction Photographs

Solution :

To protect the Abutment in case of flood situation, official authority wanted a solution to reduce the flood/erosion losses and protect the flood plains near the Abutment area. After discussion of Authority officials, consultant & TechFab Engineers it was decided to propose the system which will help to reclaim the eroded land.

Based upon the site conditions and project requirements, TechFab India has decided to construct Gabion Toe wall with stable slope (1V:2H) which will provide a sustainable, environmentally friendly solutions for this project. The maximum height of retention was 4m. This not only addresses the immediate threats posed by flooding but also ensures the long-term stability of the Abutment. To fortify the protective measures and safeguard the wall foundation from scouring, a flexible launching apron with Gabion Mattress is recommended at the river bed level. This comprehensive strategy integrates engineering expertise with environmental consciousness, offering a sustainable solution to reclaim eroded land and fortify the resilience of the Abutment against the forces of nature.

Photo 2 : During Construction Photographs

Advantages of Gabion walls:

- The proposed system did not require the heavier or/and deeper foundation that a conventional retaining wall would have.
- Gabion wall is permeable in nature and allows the water to drain off and Non-Woven Geotextile behind the gabion wall did not allow the soil to pass through so the combine system will drain off the excess water from the backfill and restrict the building up of hydrostatic pressure.
- The proposed system enables to withstand differential settlement without affecting the integrity of the structure.
- Vegetation was permitted to grow with the system, thus enabling it to blend into the natural environment and roots of the vegetation further increase the strength of the structure. which is not the case in RCC/Masonry Retaining Structure.
- Gabion Toe wall with stable slope more cost-efficient and can construct speedily compare to any other similar Rigid structure.

Application of TechGeo Nonwoven Geotextile:

- Acts as a “Filter” by preventing the backfill material from being washed out through Gabion face.
- Acts as a “Separator” between the backfill material and the Gabion facia and thereby prevents the mixing of the tow.

Photo 3 & 4 : Completed Structure - TechFab Metal Gabion & Mattress

Photo 5 : Structure After Construction

Conclusion:

The project was successfully completed and the structure is serving the desired objectives.

For further details kindly contact :

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