

CASE HISTORY

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RIVER TRAINING WITH GABION FASCIA REINFORCED SOIL WALL FOR GADHI RIVER ALONG NAVI MUMBAI INTERNATIONAL AIRPORT, NAVI MUMBAI NAVI MUMBAI, MAHARASHTRA, INDIA



River Training Works

Client:

CITY AND INDUSTRIAL DEVELOPMENT CORPORATION (CIDCO), NAVI MUMBAI

Main contractor:

Manufacturer & Supplier:

TECHFAB (INDIA) INDUSTRIES LTD.

Year of construction:

2019

Products used & Quantity Supplied:

- TECHFAB METAL GABION (ZINC 90% + AL 10%)+ PVC COATED
- TECHGEO NON WOVEN GEOTEXTILE PR-20
- TECHFAB GABION MATTRESS (ZINC 90% + AL 10%)+PVC COATED
- TECHGRID HIGH STRENGTH POLYESTER GEOGRID TGU - 100 & 200

Project description:

Due to the increased air-traffic at existing Mumbai Airport, a need for a new airport was suggested since many decades. To meet the growing need of the requirement, City and Industrial Development Corporation (CIDCO) proposed an International airport at Kopar in Raigad District of Maharashtra.

The Proposed Navi Mumbai International Airport is located on the banks of Gadhi River near Panvel Creek. Around 1600 hectares of land is required to be reclaimed in the region of Panvel Creek including Gadhi River basin. Therefore it is decided to train the Gadhi River along the airport premises to retain the Backfill soil material on upstream side from the flooding during heavy monsoons and drawdown during the dry season. (Ref below figure left portion shows reclaimed land and Trained Gadhi River)



Figure 1 : Proposed plan of River training work at Gadhi River, Navi Mumbai International Airport

Problem:

Gadhi River is the main river of the Panvel creek with a hard rock bedding surface as shown in Figure 1. Due to Industrial and Residential development around adjacent Panvel city, The Gadhi River is frequently subjected with storms from Thane creek resulting in rise of water levels.

The river had a HFL (high flood level) of 6.50m during the July 2005 flood. Thus a safe-grade elevation of 9m from bed rock level was proposed for Airport location. A Retaining wall was proposed to train the Gadhi River along the Panvel creek.



Figure 2 : Photographs of Catchment area of Gadhi River with Inundated rock formations

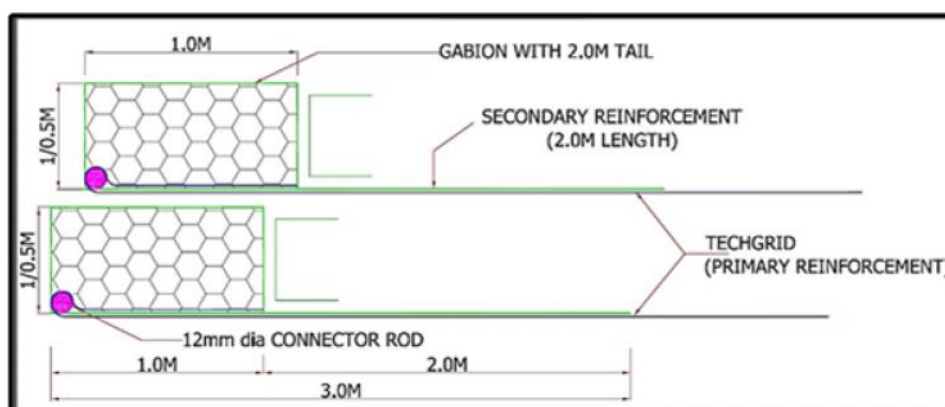
Solution:

Looking to the site conditions and project needs it is decided to go for solution which is sustainable and environment friendly which blend with the nature, so it is decided to go for composite reinforced soil wall with gabion as fascia which is most viable solution for land reclamation and river training project.

Composite Reinforced soil wall consists of high strength Polyester Uniaxial Geogrid i.e. TechGrid (TGU) as reinforcing material and TechFab Metal Gabion as fascia with GI wire mesh having special coating of zinc90% +Al10%+ PVC Coating.

The Techgrid Geogrid Uniaxial acts as soil reinforcement & TechFab Metal Gabion with stone fillings gives strong, durable and flexible fascia which also give excellent erosion protection to the entire system and protect the backfill material, porosity of Gabion fascia system allow the dissipation of pore water pressure from the backfill material as and when require, and TechGeo Nonwoven Geotextile permits the water to move through the soil while retaining all upstream soil particles. It is used to prevent soils from migrating into drainage aggregate or pipes while maintaining flow throughout the system and maintain system integrity.

Techgrid were laid with the TechFab Metal Gabion along with 12mm connector rod as shown in the sketch below, U-pins were used to fix the position in the reinforcing zone.



The reinforced soil wall was designed using BS 8006 design standards and Gabion mattress were provided with a height of 2.5m from the hard Rock level to prevent inundation and sliding at the Toe portion of the Retaining wall. Maximum height of Reinforced soil wall constructed here is of 11.5 m.



Figure 5 & 6 : Installation, Filling of Gabion mesh with stone in progress



Figure 7 : Compaction behind the wall in progress



Figure 8 & 9 : Installation, Filling of Gabion mesh with stone in progress

The benefits of Gabion Fascia Composite Reinforced Soil Wall System:

- Compare to other Conventional/ classical walls, no heavy or deeper foundation requires.
- The permeable nature of the TechFab Metal Gabion eliminates buildup of hydrostatic pressure behind the retaining structure and uplifts caused by turbulent flows.
- As the reinforced soil wall is with flexible fascia it withstands differential settlement without fracturing the structure particularly when a structure is installed on unstable and uneven ground or in an area where scours from waves or current can undermine etc.
- Permit the growth of vegetation and blend with the existing environment.
- More cost-efficient and efficient structures than any other rigid similar function structures.
- Compared to conventional concrete walls the construction period required to carry out the Composite RS wall is fast and cheap.



Figure 10 & 11 : Photographs of Completed Reinforced soil wall with Gabion Fascia



Figure 12 : Completed Structure

Conclusion:

The project was completed successfully. The client was very happy and satisfied with product quality as well as quality of work by TechFab India industries Ltd.

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