MACCAFERRI

CASE HISTORY

Rev: 1, Issue Data 20.10.2020

REINFORCED SOIL WALL FOR ASH POND IN BELLARY

BELLARY THERMAL POWER STATION, KARNATAKA, INDIA

Vertical Walls with Concrete Facing Panels

Problem

The BTPS is located at Kudatini Village of Bellary district in state of Karnataka. The client KPCL wanted to increase the capacity of the ash pond by increasing the height of existing embankment on the upstream side .The Pipe rack structure supporting the pipe carrying water to thermal power plant was running immediately after the toe of the existing embankment at downstream side. The protection on downstream side for pipe rack structure was also required to be done within available width of existing embankment. The stretch length which was required to be protected was 716 m.

Providing stable embankment ensuring the overall stability considering submergence effect from ash pond water was the major challenge in this project.

Solution

Reinforced soil panel wall using Paraweb® (MacRes® system) was proposed to build the embankment within available width. The system is comprised of discrete concrete panels as fascia connected to Paraweb® placed within soil layers.

As the embankment was prone to water submergence, the peripheral joints of panels were sealed from inside using impervious geosynthetic material (geomembrane) known as MacLine®, having a thickness of 1.5mm. MacLine® was placed on the inner face of panels by cutting at the location of connector.

The proposed embankment was modelled in MacStars & checked for the global stability considering the submerged condition & full drawdown. It was found that the ground improvement needs to be provided as the safe bearing capacity of soil was not sufficient to withstand the load over it. It was decided to provide a sand pile at grid spacing of 1x1m to improve the bearing capacity. A geogrid of 300 KN/m was suggested over sand piles to increase bearing capacity and to control differential settlement. However, on downstream side the soil replacement of 600mm was proposed below leveling pad as ground improvement.

The project is blend of different civil engineering solutions, which includes water containment, earth retaining & foundation soil treatment. This project is the first of its type in India in which reinforced soil wall technology using concrete panels is used to retain water and augmentation of capacity.

Client: Karnataka Power Corp Ltd (KPCL)

Designer / Consultant: Maccaferri (Designer) / IIT Bombay

Contractor: M/s PJB Engineers Pvt. Ltd.

Products used (Qty.)

- MacLine Smooth 5,000 sqm
- MacRes 14,512.2 sqm

Date of construction: 09/2016 - 03/2017

Photo 1: Site before construction of RS wall

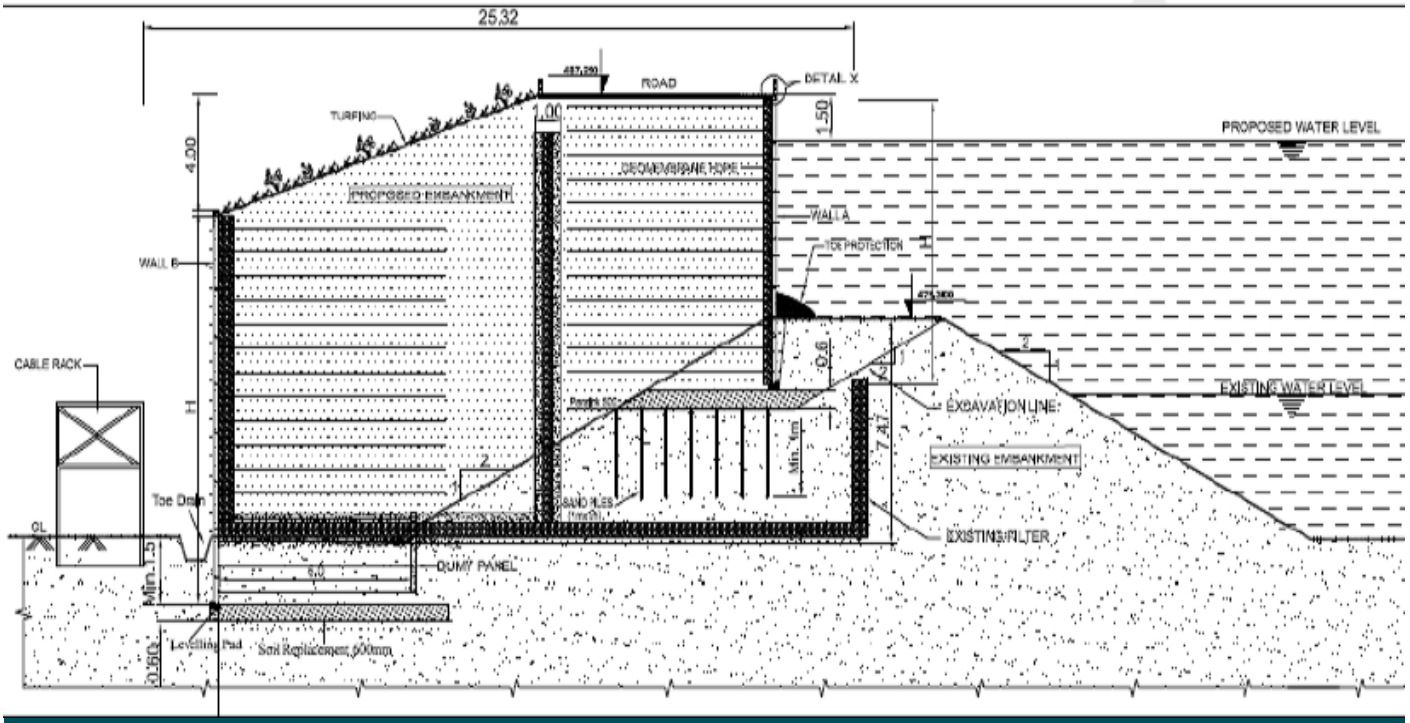
Photo 2: Cutting of embankment toe and laying of levelling pad

Photo 3: Sand piling

Photo 4: Laying of geogrid

Photo 5: Laying of ParaWeb®

Photo 6: Compaction of soil



Typical project drawing section

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