

CRUSHER WALL AT SERAJUDDIN MINES
JODA, ORISSA INDIA

REINFORCED SOIL WALL AS CRUSHER WALL

Product: Terramesh[®], ParaLink[®], Terram

Problem

The clients, Serajuddin Mines, wanted to build a central ore handling plant at its facility in Joda, Orissa, in India. Joda is a city in the Kendujhar district of the state. It is an area that has rich iron ore deposits and the economy centres on the large-scale production of steel.

Solution

To facilitate the construction of the plant infrastructure, access works were required to accommodate a 22 m-high loading bin at the site of the primary crusher.

The terrain at the design location was extremely challenging and a retaining wall was necessary to create a safe platform for heavy duty unloading trucks. Here, as at many other mining sites, the reinforced soil structures within tip and crusher walls needed to withstand loaded vehicles in excess of 300 tonnes.

The structure selected also had to be flexible due to:

- High vertical and horizontal loads (175kPa & 900kN respectively), imposed by the mine dump trucks
- Presence of a layer of softer soil with low bearing capacity in close proximity to the base of the structure increasing the risk of differential settlement

Maccaferri's Terramesh[®] System was selected for its inherent flexibility, including in tall walls. The system, made from heavily galvanised steel wire mesh with an additional polymer coating, is engineered for long-term design strength and technical performance whilst being resistant to chemical, biological and environmental degradation.

Used in combination with reinforcement geogrids, it can create, tall, vertical or near vertical walls for difficult applications like mine crusher walls and other infrastructure. These hybrid 'Paramesh' structures feature combinations of Maccaferri products, carefully selected to optimise design and construction efficiency.

For Serajuddin, a 22 m-high vertical wall was designed using the MacStars W design software.

The engineered solution utilised:

- Terramesh[®] System modular soil reinforcement system
- ParaLink[®] high performance geogrid

Client:

SERAJUDDIN MINES

Main contractor:

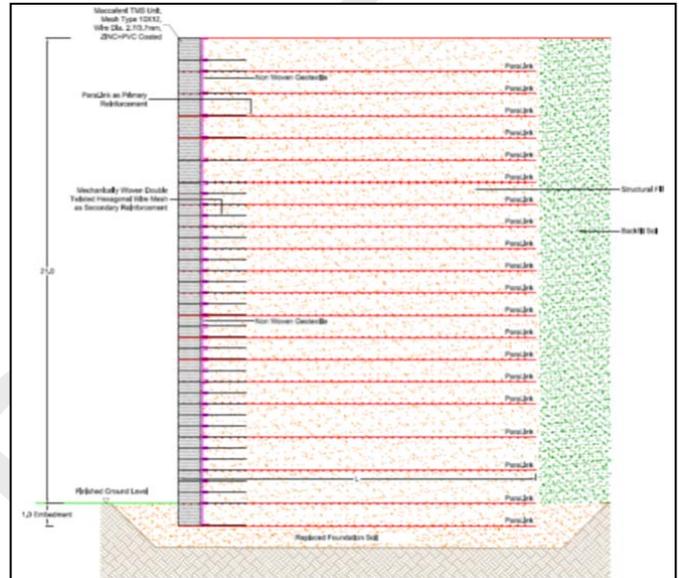
M/S THRIVENI EARTHMOVERS PVT.LTD

Products used:

Terramesh[®] System, PARALINK

Date of construction

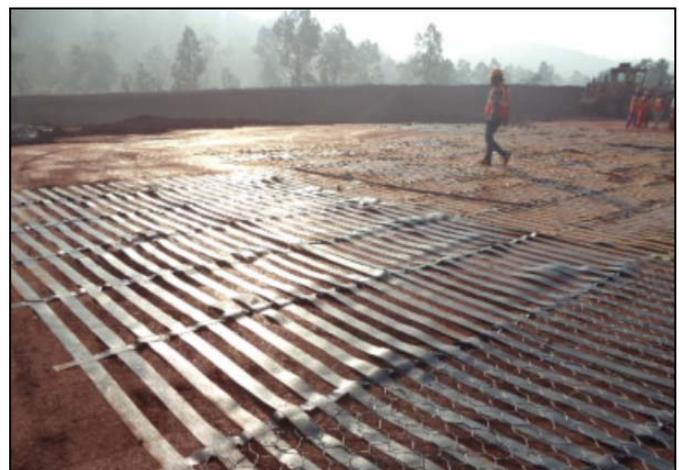
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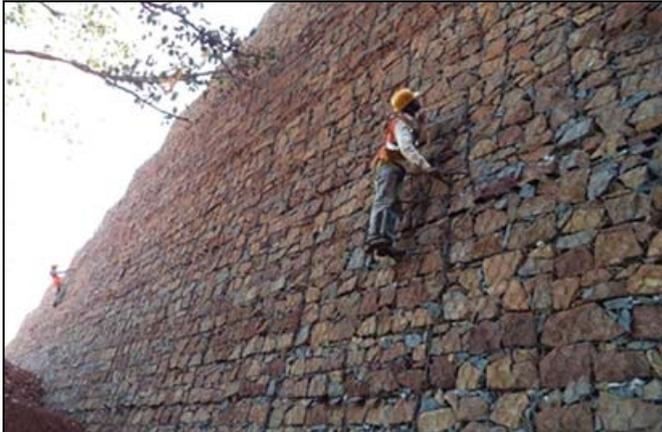
Cross sectional details of 22m high Crusher Wall (Main Wall)



Compaction at Wing Wall area during construction



Laying of ParaLink[®]



The Quality Assurance Team checks the alignment



Crusher walls and wing walls that support on-site ore processing

High-strength ParaLink® reinforcement was installed at 1 m centres throughout the reinforced soil structure. This complemented the Terramesh® units, which provided the wall fascia element with their integral geogrid used as secondary soil reinforcement. The reinforcement length within the main wall section was 16 m.

A non-woven geotextile was inserted behind the gabion fascia units Terramesh® as a separator between the unit and the compacted backfill.

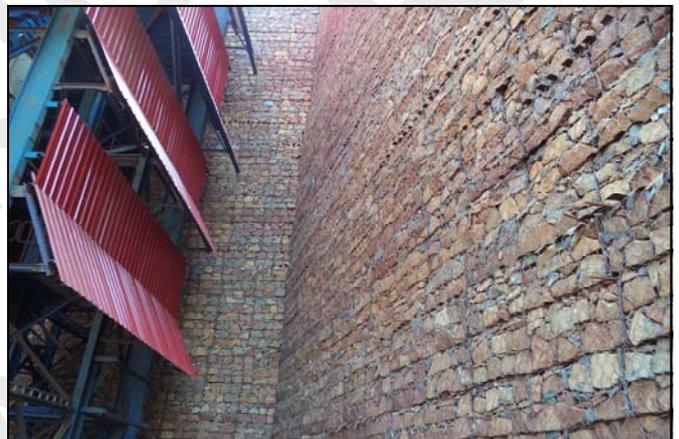
Once completed, the 22 m-high crusher wall had a surface area of 1771m². A wing wall on each side of the main wall tapered off at a slope of 1:2 (V:H) with an overall length of 82 m.

The wall was founded on a 1 m-thick foundation of compacted granular material. Only pre-approved selected soil was used as backfill and compacted to 95%(+/-2%) Proctor density. Quality control of compaction on-site was strictly monitored.

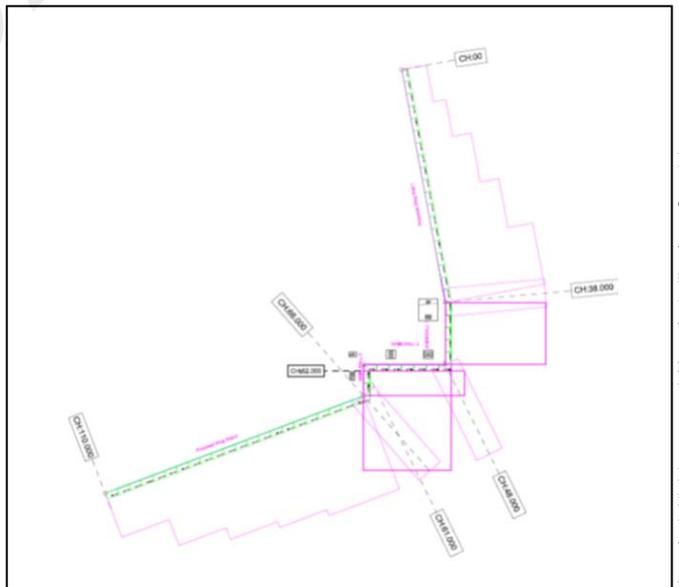
Benefits:

- The selection process included the reuse of site-won materials, which saved on project cost and helped to drive down the carbon footprint of the works considerably
- Additional time savings and project economy were realised through the supply of geogrid rolls with the correct 'tail length' measurements by the installation contractor, Thriveni Earthmovers Pvt.Ltd. This manufacturing flexibility from Maccaferri significantly reduced the material wastage
- The construction itself provided a much-needed local boost to the economy through the employment of 70 labourers a day.

The project was successfully completed in two months.



Vertical construction is possible with a strong, geosynthetic reinforcement system



General arrangement of Crusher Wall (incl. Main Wall & Wing)

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