

## CASE HISTORY

Rev:00, Date : 26.02.2025

### SLOPE PROTECTION WORKS USING TECHFAB GREEN RETAINING WALL (GREEN GABION WALL SYSTEM) AND GEOCELL AT JSW STEEL LTD., VIJAYANAGAR WORKS, BELLARY, KARNATAKA

BELLARY, KARNATAKA, INDIA



#### Slope Protection

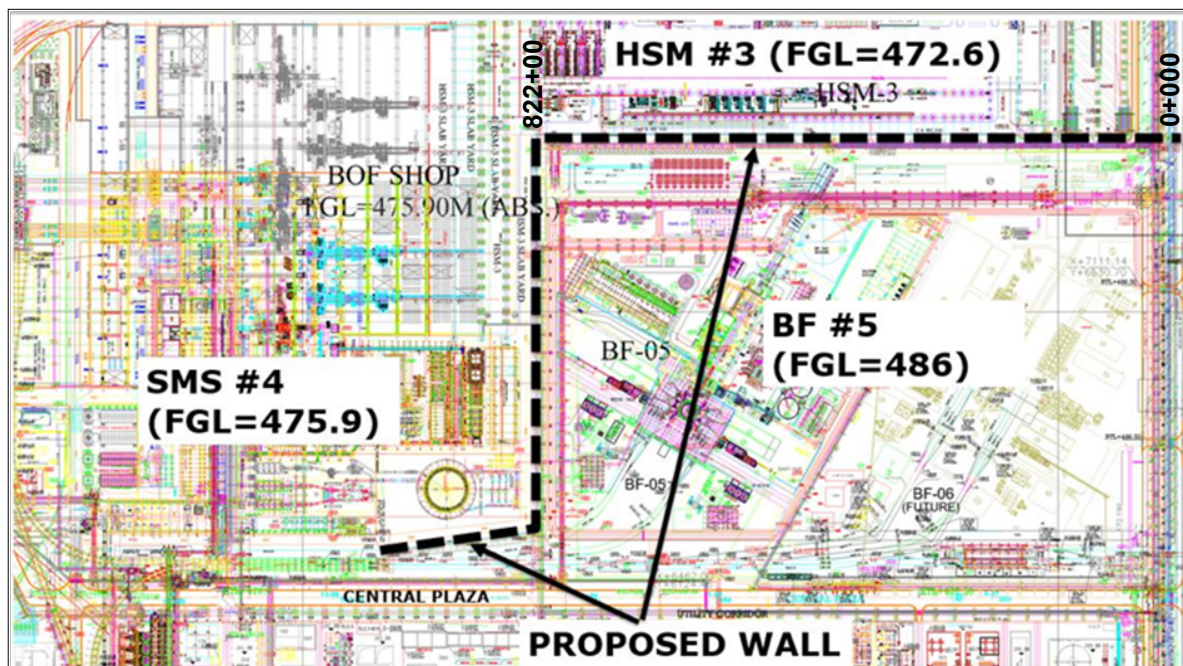
|                                      |                                                                                                                                                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client:                              | Products used :                                                                                                                                                 |
| JSW STEEL LTD, BELLARY               | <ul style="list-style-type: none"><li>• TECHFAB METAL GABIONS</li><li>• TECHCELL GEOCELL (712 X 75mm Type)</li><li>• TECHGEO NONWOVEN GEOTEXTILE PR20</li></ul> |
| Contractor:                          |                                                                                                                                                                 |
| IMPERIAL TECHNICAL SERVICES PVT. LTD |                                                                                                                                                                 |
| Manufacturer & Supplier:             | Year of construction                                                                                                                                            |
| TECHFAB (INDIA) INDUSTRIES LTD.      | 2024                                                                                                                                                            |

#### Project brief

JSW Steel Ltd.'s Vijayanagar Works, located in Toranagallu, Bellary, Karnataka, is one of India's most advanced integrated steel manufacturing facilities. As part of its expansion, the construction of a new Hot Strip Mill (HSM) is already underway. The site also includes a newly constructed Blast Furnace (BF). However, there is a significant elevation difference of approximately 13 meters between these two structures - BF at 486m and HSM at 472.6m. To ensure the stability and safety of the ongoing Hot Strip Mill construction, slope protection measures must be implemented immediately to prevent erosion, soil movement, and potential failures that could impact the structural integrity and progress of the project.

#### Problem Description:

The existing slope between the Blast Furnace and the Hot Strip Mill had a steep inclination of approximately 60 degrees with the horizontal and a total length of about 1,900 meters. Due to the significant height difference, this steep slope was vulnerable to erosion, soil movement, and potential failure caused by external loads, weathering, and construction activities. Without proper stabilization, there was a high risk of soil erosion, slope failure, and operational delays. To mitigate these risks, an engineered slope protection solution must be designed and implemented to ensure long-term stability, safety, and sustainability of the site, enabling smooth and secure construction of the Hot Strip Mill while maintaining the integrity of the Blast Furnace and surrounding infrastructure.



Site Layout Showing Proposed Slope Protection Wall



**Photo 1 : Pre-Construction Site Condition : Unstable Slope**

### **Solution Proposed:**

The client required a sustainable slope protection solution utilizing iron ore slag. Additionally, they emphasized the need for an environmentally friendly and aesthetically appealing solution. Due to these requirements, rigid retaining structures such as reinforced concrete walls and other conventional solutions were not feasible.

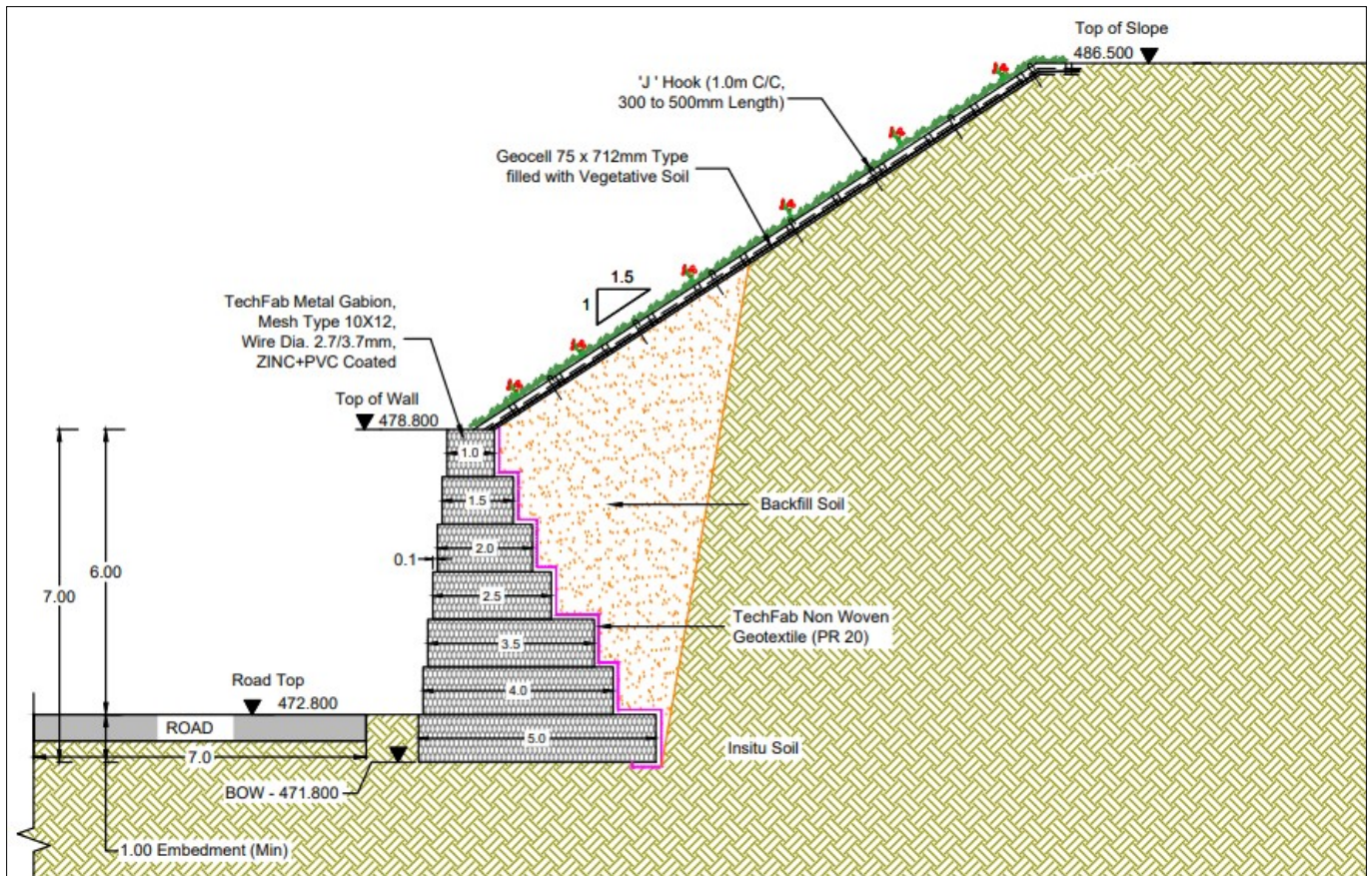
To fulfill the client's needs, TechFab India proposed a Gabion retaining wall as the only viable solution. The design includes a 6.0m high TechFab Metal Gabion toe wall, utilizing iron ore slag as infill material. This modular, permeable, and durable structure effectively counteracts lateral soil pressure while ensuring long-term slope stability. Above the toe wall, the remaining 7.5m of the slope is protected using Geocell, which enhances erosion control, reinforces the soil, and improves overall structural integrity. This combined system provides a total slope protection height of 13.5m, ensuring a sustainable and resilient solution.

To enhance drainage and filtration, TechGeo Nonwoven Geotextile PR 20 was installed behind the gabion wall. This geotextile prevents soil migration while allowing water to pass through freely, thereby maintaining wall stability and preventing erosion.

The Gabion Wall not only provides a structurally robust solution but also integrates seamlessly with the surrounding landscape. The permeable nature of gabions allows water drainage, reducing hydrostatic pressure and preventing slope failure. To further enhance environmental sustainability, vegetation is introduced above the slope and along the offset of the retaining wall, reducing erosion and promoting a green ecosystem.

Phase 1 of this project, covering Chainage 0+000 to 822+000, has been constructed, ensuring a stable foundation for the ongoing construction of the Hot Strip Mill.





Typical Cross Section Drawing



Photo 2, 3 & 4 : During Construction Photographs





**Photo 5 : Installation of Geocell above Gabion Wall**



**Photo 6 : Sustainable Slope Protection, Greenery Begins**



**Photo 7 : Slope Stabilized with Growing Vegetation**

### **Conclusion:**

Phase 1 (Chainage 0+000 to 822+000) of this project was successfully completed and is performing as expected, meeting the satisfaction of both the client and contractor. This demonstrates TechFab India's dedication to eco-friendly engineering solutions that ensure long-term slope stability, mitigate erosion risks, and facilitate smooth Hot Strip Mill construction. By incorporating Gabion Walls, Geocells, and Geotextiles, TechFab India provides a sustainable solution that seamlessly integrates durability, safety, and environmental harmony.

**For further details kindly contact :**

### **TechFab India Industries Ltd.**

46&47, Maker Chambers VI, Nariman Point, Mumbai - 400021

Tel: + 91- 22 - 2287 6224 / 6225

E: [info@techfabindia.com](mailto:info@techfabindia.com)

W: [www.techfabindia.com](http://www.techfabindia.com)