CONSTRUCTION OF THE DUQM REFINERY SERVICE CORRIDOR TO THE LIQUID J DUQM, AL WUSTA , OMAN

Basal Reinforcement

Problem

SEZAD plans to build a service corridor in the industrial zone of Dugm, Oman. The project aims to link Dugm refinery with a liquid jetty by allowing the Refinery to lay its pipes and connecting it to the Port. The project was awarded to Qurum Business Group LLC under the scope of Engineering. Procurement & Construction. The last 3 km stretch of the project lies close and parallel to the Dugm Road Nos. 1 and 5 project. This location is characterized by the significant presence of 'soft clay/sabkha' soil, which influences the construction of foundations of the proposed service corridor that consists of concrete sleepers supporting pipelines, service roads, etc. The FEED design requires the EPC contractor to replace the entire Sabkha soil with engineered fill if the depth of Sabkha is less than 4 m. For locations where Sabkha depth is more than 4 m, ground improvement techniques like stone columns shall be adopted. Nonetheless, the potential cost of doing stone columns is very high, and this prompted the EPC contractor to look for alternate viable options.

Solution

From the successful application of Basal Reinforcement technique in the neighboring project; "Dugm Roads 1 & 5", the EPC contractor was aware of the potential benefits of using geosynthetics to solve problems in similar ground conditions and subsequently approached Maccaferri Middle East (MME) propose a suitable alternate scheme of ground stabilization. After making the required studies, MME suggested a ground stabilization solution consisting of high strength ParaLink geogrids as basal reinforcements, underlaid by a layer of thick boulder layer. In the required sequence of works, pile driving activity is required to be done after completion of embankments. Since the expected static & dynamic loading during the pile driving activity were significant (up to 250 KPa), additionally three layers of Macgrid EG geogrid were provided below the zone of movement of pile rig machine. These three layers of Macgrid EG geogrids would disparate the pile driving loads into a wider area, thereby limiting the rut depth at the embankment top. MME was involved in the design, supply, and site assistance of the project.

Client: Special Economic Zone Authority, Duqm Designer / Consultant: National Engineering Office Contractor: QBG Contracting / PATEL JV Products used (Oty.)

- MacGrid EG 140,00	0 sq.m
- ParaLink 150,00	0 sq.m

Date of construction: 01/2019 - 12/2019





Macgrid EG geogrids





Various stages of construction



Pile driving above geogrid stabilized embankment



Macgrid EG geogrid laying at concrete sleeper locations



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Concrete sleepers completed
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Completed service corridor with various pipelines above concrete sleepers

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