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Geotechnical Evaluation and Sizing of the Reinforcement Layer on Soft Soil in the Construction of the North Triage Road Clover, in Brasilia Federal District, Brazil

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Abstract : The constant growth of the fleet of vehicles in the big cities, makes that the Engineering is dynamic, with respect to the new solutions for traffic flow in general. In the Federal District (DF), Brazil, it is no different. The city of Brasilia, Capital of Brazil, and Cultural Heritage of Humanity by UNESCO, is projected to 500 thousand inhabitants, and today circulates more than 3 million people in the city, and with a fleet of more than one vehicle for every two inhabitants. The growth of the city to the North region, made that the urban planning presented solutions for the fleet in constant growth. In this context, a complex of viaducts, road accesses, creation of new rolling roads and duplication of the Bragueto bridge over Paranoa lake in the northern part of the city was designed, giving access to the BR-020 highway, denominated Clover of North Triage (TTN). In the geopedological context, the region is composed of hydromorphic soils, with the presence of the water level at some times of the year. From the geotechnical point of view, are soils with SPT < 4 and Resistance not drained, Su < 50 kPa. According to urban planning in Brasília, special art works can not rise in the urban landscape, contrasting with the urban characteristics of the architects Lúcio Costa and Oscar Niemeyer. Architects hired to design the new Capital of Brazil. The urban criterion then created the technical impasse, resulting in the technical need to 'bury' the works of art and in turn the access greenhouses at different levels, in regions of low support soil and water level Outcrossing, generally inducing the need for this study and design. For the adoption of the appropriate solution, Standard Penetration Test (SPT), Vane Test, Diagnostic peritoneal lavage (DPL) and auger boring campaigns were carried out. With the comparison of the results of these tests, the profiles of resistance of the soils and water levels were created in the studied sections. Geometric factors such as existing sidewalks and lack of elevation for the discharge of deep drainage water have inhibited traditional techniques for total removal of soft soils, thus avoiding the use of temporary drawdown and shoring of excavations. Thus, a structural layer was designed to reinforce the subgrade by means of the 'needling' of the soft soil, without the need for longitudinal drains. In this context, the article presents the geological and geotechnical studies carried out, but also the dimensioning of the reinforcement layer on the soft soil with a view to the main objective of this solution that is to allow the execution of the civil works without the interference in the roads in use, Execution of services in rainy periods, presentation of solution compatible with drainage characteristics and soft soil reinforcement.

Keywords : layer, reinforcement, soft soil, clover of north triage
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