MARKET SECTOR:
RESIDENTIAL

LOCATION:
Barum Knoll / Raleigh Park, Barnstaple

DEVELOPER:
BARRATT DAVID WILSON HOMES

CONTRACTOR:
ROADFORM CIVIL ENGINEERING / CHAMPION GROUNDWORKS

Case

STUDY

STRATAGRID, LANDLOK, EKOTEX AND DUODRAIN

The

BACKGROUND

Barum Knoll is a residential development comprising 106 new homes in Barnstaple, Devon on a 4.17 hectare parcel of land to the south of North Devon District Hospital.

Champion Groundworks had been approached by Roadform Civil Engineering to supply and build a geogrid reinforced soil slope to create a development plateau on the sloping site.

In turn Champion Groundworks approached Geosynthetics Ltd. to discuss the scheme requirements, and to see how an initial proposal could be value-engineered.

Our Client's

REQUIREMENTS

A 265m long vegetated face reinforced soil slope was needed to create a development platform raised between 1.4m and 6.2m above the existing ground levels.

This solution had already chosen as it best provided what was required in terms of cost, sustainability and an appropriate face appearance for the location.

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Our Value Engineered

SOLUTION

Having been provided with all the necessary input information, Geosynthetics Ltd 'In-House' Engineering team ran internal and external stability calculations in accordance with BS8006:2010 and BSEN1997-1:2004 – Eurocode 7 to optimise the design for a series of slopes up to a maximum height of 6.2m, ensuring the sloping ground in front of the system was accounted for. Surcharge loading on the reinforced slope was predominantly from the rear gardens to the new properties, but in a few locations garages or parking spaces were close to the slope crest so this additional loading was included.

The Geosynthetics Ltd 'value-engineered' solution centred on uniaxial Stratagrid SGU60. The geogrid vertical spacings were designed so as not to exceed the maximum 500mm height of the rising formwork system. Additionally, the geogrid 'tail lengths' were progressively reduced in the upper layers of each cross section. Landlok 450 erosion control matting was used at the face to retain the topsoil necessary for vegetation establishment. There was some concern about groundwater movement so a geocomposite layer was detailed at the back of the reinforced soil block and also in 2-3 horizontal layers within the reinforced soil block

In order to neatly construct the required 70 degree face from the flexible geosynthetic components some kind of formwork was required. Typically this consists of Geosynthetics Ltd's sacrificial steel 'Rivel Mesh' system, however, being highly experienced in constructing reinforced soil solutions Champion Groundworks used their own 'rising formwork' system, so the Rivel Mesh system was not required. Instead, the rising formwork was used to construct each layer before being moved up to construct the next layer and so on, before eventually being taken off site to the 'next scheme'.

The reinforced soil slopes were constructed from around 12,000m3 of site-won granular Head deposit Class 1A/1B material as specified in the Standards for Highway Works Series 600. Given that the fill was stoney and angular in nature the relevant reduction factors were selected from BS8006 and the Stratagrid BBA certificate to be used in the calculations.

So as to not to hinder other activities on site Champion Groundworks constructed the almost 1,000m2 of exposed slope face in a tight 8 week build programme. Despite the tight deadline, the photographs clearly shown the quality of finish which is a testament to the expertise, care, and attention to detail of the site team.

Why Geosynthetics Ltd

STOOD OUT

- COST EFFECTIVE AND SUSTAINABLE 'GREEN ENGINEERED' SOLUTION
- 6.2M HIGH, 265M GEOGRID REINFORCED SOIL RAISED DEVELOPMENT PLATFORM
- RE-USE OF STONEY/ANGULAR SITE WON MATERIAL

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