Case Study – Rock Anchoring, Gibraltar

Project

- The stabilisation of fault-brecciated limestone cliffs in SW Gibraltar, which had previously suffered serious (15,000m^3) landslides.

Client Requirements

- The cost effective stabilisation of the landslip area and adjacent overhanging 70m high cliff, utilising multi-strand rock anchors.
- The contractor to work closely with the engineer determining anchor design on a hole-by-hole basis, depending on the ground conditions encountered.

CAN Solution

- The challenging access meant that the only economic solution was to use rope access techniques.
- CAN used bespoke drill rigs to facilitate drilling in vertical and sub-vertical locations.
- A requirement to work closely with the engineer to specify anchor length depending on localised ground conditions encountered. CAN then determined the necessary anchor bond length to meet design load criteria.

- DTH drilling systems were used to install 158 multi-strand rock anchors up to 32m in length, with a 500kN working load and typical bond length of 4m. These anchors were cyclically stressed in accordance with the British Standard, and fitted with epoxy-painted, grease-filled head assemblies.
- CAN also used rotary percussive drilling systems to install 154 high yield steel rock bolts with an average length of 7m and 100kN working load. All components were galvanised and anchored with either cementitious grout or polyester resin.
- Other ancillary works included the installation of rockfall netting and application of dry sprayed concrete to infill large fissures.

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