

Bolt Products Anchor Test Report 5th October 2011

Introduction

This test report is for the Bolt Products 8mm twisted stainless steel bar anchor.



Ingleton Quarry 05th October 2011

Method

33 Bolt Products anchors were installed in limestone on 01st October 2011. The anchors were installed in compliance with the BCA E&T Committee document "Permanent Resin Bonded Anchors – Installation Procedure, Training and Documentation" (IPTD); which is the same as the recommend procedure by the manufacturer. The holes were drilled to 100mm deep and cleaned using water (pressure wash), brushed and washed until all the limestone dust had been removed, the holes were then dried using absorbent cloth. The anchors were secured in the substrate using R-KER Epoxy Acrylate Styrene free resin. This is manufactured by RAWL Fixings. The anchors were left unloaded for 4 days until test to failure on 05th October 2011. On 05th October 2011 twelve anchors were tested to destruction.



During the test period it became apparent that the chemical anchor mortar had not thoroughly mixed during application into a hole. The peak load to remove this anchor was 36KN. RAWL have been contacted and from the information supplied by us have initiated an investigation.

The failure mode initially is similar to a DMM Eco anchor with elongation of the eye towards the direction of the applied load. However, unlike an Eco anchor as it is extracted from the substrate the anchor twists until the load is released as the anchor suddenly egresses from the resin; the load is then gradually increased until the anchor starts to twist and the process is repeated until the anchor is extracted from the substrate.



Conclusions

From the test data gathered from this test comprising in total of 12 Bolt Products anchors. It is evident that the anchor and peak load force is consistently similar in performance and strength to the DMM Eco anchor.



Deformation

Deformation is the point at which the eye of the anchor starts to deform in the direction of the applied load, not the point at which the anchor eye lifts from the substrate.

Peak load

The ultimate failure load i.e. the peak load at which the anchor started to egress from the resin or the load required to extract the anchor from the resin, whichever was higher, was within the range 32-47kN. with a mean of 38.2kN.

Mean Deformation kN = 20.7kN. Range of Deformation kN = 18-23 i.e. 6kN
Mean Max Load = 38.2 kN. Range Max Load = 32-47 i.e.16kN

Anchor No.	Deformation kN	Peak/Max Load kN
1.	20	33
2.	18	35
3.	19	35
4.	21	47
5.	19	34
6.	21	47
7.	21	32
8.	23	47
9.	23	42
10.	21	36
11.	20	35
12.	22	35

Operatives:- L.Sykes (CNCC), G.Jones (CNCC), R.S.Dearman (DCA), S. Sykes.

Report compiled by L. Sykes & R. Dearman.