



Flexural Toughness Equal to Steel

INTRODUCTION

This is a summarised report based upon extracts from research testing conducted by Dr. Stefan Bernard at the University of Western Sydney and at the M5 Motorway Tunnel Project in Sydney AUSTRALIA.

The three specimens in this report were selected to provide comparative data on alternative materials for the reinforcement of shotcrete linings used in underground support:

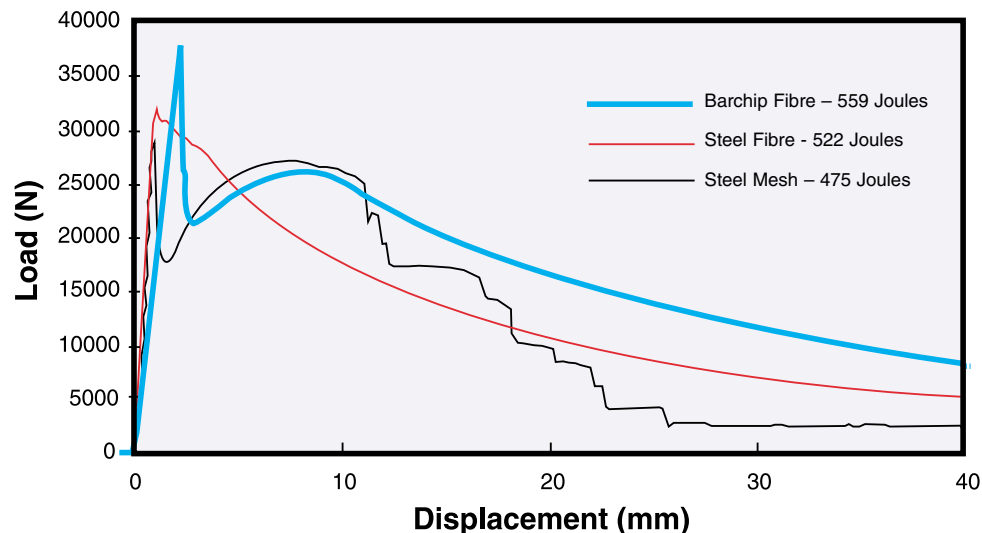
No.	Specimen	Description
1	Barchip MHT 48mm Synthetic fibre	Dosage rate of 10 kg / m ³
2	Steel Fibre – High Performance Hooked end	Dosage rate 40 kg / m ³
3	Steel Mesh (Type F41)	4 mm wire at 100 mm centres

EXPERIMENTAL PROGRAMME

Round Determinate Panels of nominal 800mm diameter and 75mm depth were prepared for each of the three reinforcing materials to simulate sections of a shotcrete lining. All specimens were cured under standard laboratory conditions for 28 days prior to testing.

Results are expressed as load vs displacement graphs where the area under the curve can be calculated to provide a total energy absorption (Joules) for a 40 mm central displacement of the specimen.

RESULTS



CONCLUSION

Barchip fibre reinforced shotcrete is capable of sustaining superior energy absorption values when compared to steel fibre or steel mesh reinforced shotcrete and is undoubtedly the most suitable reinforcement selection where high ground deformations are expected.

References: 1. UWS Engineering Report CE9 • 2. UWS Engineering Report CE15 • 3. TSE Report on Age Dependent Performance of Fibre Reinforced Shotcrete.

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