

# *Interface Bond Values for Micropile Design*

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# ***Background:***

- Micropiles up to 2500kN (250 metric tonnes; 280 US tons) compression
- 500kN tension
- Base of 500-750mm (20 to 30 inch) tubular piles
- Replace large diameter rock sockets

## *Design of interfaces:*

### *(1) Compression:*

- *End-bearing on micropile head*
- *Grout-to-reinforcement bond*
- *Grout-to-rock bond*

# *Design of interfaces:*

## (2) Tension

- Grout-to-rock bond
- Grout to reinforcement bond
- Grout-to-tubular steel pile bond

## *Grout-to-rock bond:*

### *Sources of test information:*

- *Ground anchors*
- *Soil nails*
- *Rock bolts*
- *Rock dowels*
- *Conventional bored piles*

## *Common reference sources:*

- *BS8081:1989 /*
- *Littlejohn & Bruce 1977*
- *Barley 1988*
- *Littlejohn 1980*
- *Cole & Stroud 1977*  
+ *Stroud 1988*

## ***Other test data:***

- From Turner *et al* since 1980
- Attached as Tables 1 and 2
- Table 1: covers rock anchor tests up to 1980
- Table 2: covers ground anchor and micropile tests up to present-day

## *Identifiers:*

- *Rock type (mainly)*
- *Geological formation, age etc*
- *Weathering grades*
- *Young's Modulus*
- *UCS*
- *TCR*
- *RQD*



## ***Test values recorded:***

- *Max bond stress (no failure)*
- *Ult bond stress, where achieved*
- *Max applied test force*
- *Design bond stress adopted*
- *(+ drill-hole diameter)*

## ***Rough conclusions:***

- *RQD <25% affects bond*
- *Chalk bond correlates with SPT*
- *Weak mudrocks correlate with SPT*
- *UCS/10 correlates 'roughly'*

## *Further rough conclusions:*

- *Micropiles in near surface rocks:  
reduce bond value by half*
- *Expect increasing hole diameter  
= decreasing bond value.*
- *Degree of weathering should  
affect bond*