











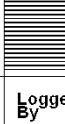
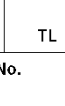







|  |            |  |            |                                    |   |  |                              |   |   |              |
|--|------------|--|------------|------------------------------------|---|--|------------------------------|---|---|--------------|
|  <b>British Geological Survey</b><br>NATURAL ENVIRONMENT RESEARCH COUNCIL |            |  |            |                                    |   | <b>Site</b><br>M1 WIDENING JUNCTION 21 TO 30 PRELIMINARY GI-CONTRACT 2 |                              |   | <b>Borehole Number</b><br>RC1231  |              |
| <b>Machine:</b><br>Flush :<br>Core Dia: mm<br>Method :   |            | <b>Casing Diameter</b><br>140mm cased to 3.00m |            | <b>Ground Level (mOD)</b><br>92.90 |   | <b>Client</b><br>Highways Agency                                       |                              | <b>Job Number</b><br>WAL060099  |   |              |
|  |            | <b>Location</b><br>445187 E 369057 N           |            | <b>Dates</b><br>07/09/2006         |   | <b>Engineer</b><br>Arup  |                              | <b>Sheet</b><br>1/2   |   |              |
| <b>Depth (m)</b>   | <b>TCR</b> | <b>SCR</b>                                     | <b>RQD</b> | <b>FI</b>                          | <b>Field Records</b>                                    | <b>Level (mOD)</b>   | <b>Depth (m) (Thickness)</b> | <b>Description</b>  | <b>Legend</b>   | <b>Water</b> |
| 0.00   |            |  | 0          | 0                                  | Groundwater was not apparent during boring(1) at 0.00m. | 92.70  | (0.20)<br>0.20               | TOPSOIL.  |    | ✓1           |
|  | 100        | 88   | 0          | 0                                  |   |  |                              | Very weak red brown/brown highly weathered SILTSTONE with very frequent extremely closely spaced very narrow clay filled fissures. Clay is generally stiff, variably soft to firm.  |    |              |
| 1.20   |            |  |            |                                    |   |  | (1.90)                       | Between 1.20m and 1.60m; plant rootlets.  |    |              |
|  |            |  | 0          | 0                                  |   |  |                              |   |    |              |
| 2.10   |            |  |            |                                    |   | 90.80  | 2.10                         | Very weak (variably weak) grey brown thinly laminated weathered SILTSTONE. Weathering: Frequent dark brown and orange discolouration penetrating throughout. Fractures: Horizontal (0 to 15 degrees) extremely closely to At 2.60m; pocket soft grey gravelly clay. (40mm). very closely spaced (5/15/40), smooth planar, frequently irregular, others subhorizontal to vertical, extremely closely   |   |              |
| 3.00   |            |  |            |                                    |   |  |                              | Between 3.00m and 3.40m; Non-intact.  |  |              |
| 3.40   |            |  | 0          | 0                                  |   |  |                              | to very closely spaced and irregular. Apparently random strike.   |  |              |
| 3.75   |            |  | 0          | 0                                  |   |  | (3.00)                       | Between 3.75m and 4.00m; Non-intact.  |  |              |
| 4.00   |            |  |            |                                    |   |  |                              |   |  |              |
| 4.20   |            |  |            |                                    | D101  |  |                              |   |  |              |
|  |            |  | 0          | 0                                  |   |  |                              |   |  |              |
| 5.10   |            |  |            |                                    |   | 87.80  | 5.10                         | At 5.00m; very thin bed ironstone. (30mm).  |  |              |
| 5.35   |            |  |            |                                    | P1  |  |                              | Weak (variably very weak) dark grey black thinly laminated MUDSTONE with rare very thin beds of moderately strong ironstone (50mm). Orange brown discolouration penetrating <1mm on fracture surfaces. Fractures: Horizontal (5 to 20 degrees) extremely closely and very closely spaced smooth, planar to irregular, tight to open, others, subvertical, vertical and irregular.   |  |              |
| 5.70   |            |  | 0          | 0                                  | D102  |  |                              |   |  |              |
| 5.65   | 100        | 50   | 0          | 0                                  |   |  |                              |   |  |              |
| 6.00   |            |  | 0          | 0                                  |   |  |                              |   |  |              |
| 6.15   |            |  | 0          | 0                                  |   |  |                              |   |  |              |
| 6.80   |            |  | 0          | 0                                  |   |  | (3.10)                       |   |  |              |
| 7.00   |            |  |            |                                    |   |  |                              | Between 7.20m and 7.45m; slightly carbonaceous. At 7.20m; very thin bed ironstone. (50mm).  |  |              |
|  |            |  | 0          | 0                                  |   |  |                              | Between 7.70m and 8.00m; non-intact, slightly carbonaceous, variably clayey.  |  |              |
| 8.20   |            |  |            |                                    |   | 84.70  | 8.20                         | Weak thinly laminated grey MUDSTONE. Thinly to medium interbedded with weak and occasionally moderately weak light and dark grey thinly colour laminated SILTSTONE. Siltstone contains occasional beds <30mm moderately strong brown ironstone. Occasional heavy red brown discolouration penetrating up to 2mm on fracture surfaces. Fractures: Horizontal (5 to 15 degrees) very closely to medium spaced, smooth, planar, irregular, moderately open, subvertical smooth, planar and irregular, typically very open, others vertical smooth and irregular. |  |              |
| 8.70   | 100        | 95   | 0          | 0                                  | D103  |  |                              | Between 8.50m to 8.75m; vertical and irregular fracturing.  |  |              |
| 8.80   |            |  |            |                                    | P2  |  |                              |   |  |              |
| 9.00   |            |  |            |                                    |   |  |                              |   |  |              |
| 9.50   |            |  |            |                                    | P3  |  |                              |   |  |              |
| <b>Remarks</b>   |            |  |            |                                    |   |  |                              | <b>Scale (approx)</b><br>1:50   | <b>Logged By</b><br>TL  |              |
|  |            |  |            |                                    |   |  |                              | <b>Figure No.</b>   |   |              |
|  |            |  |            |                                    |   |  |                              |   |   |              |



|  <b>British Geological Survey</b><br>NATURAL ENVIRONMENT RESEARCH COUNCIL |                |     |   |                       |                             |                | Site<br>M1 WIDENING JUNCTION 21 TO 30 PRELIMINARY GI-<br>CONTRACT 2 |  |                    | Borehole<br>Number<br><b>RC1231</b> |  |
|--|----------------|-----|---|-----------------------|-----------------------------|----------------|---|--|--------------------|-------------------------------------|--|
| Machine:<br>Flush :<br>Core Dia: mm<br>Method :  |                |     | Casing Diameter<br>140mm cased to 3.00m |                       | Ground Level (mOD)<br>92.90 |                | Client<br>Highways Agency   |  |                    | Job<br>Number<br>WAL060099          |  |
|  |                |     | Location<br>445187 E 369057 N           |                       | Dates<br>07/09/2006         |                | Engineer<br>Arup  |  |                    | Sheet<br>2/2                        |  |
| Depth<br>(m)   | TCR            | SCR | RQD                                     | FI                    | Field Records               | Level<br>(mOD) | Depth<br>(m)<br>(Thickness)   | Description  | Legend             | Water                               |  |
| 10.20  | 100            | 85  | 0                                       | 0                     | D104                        |                |   |  |                    |                                     |  |
| 11.45  |                |     |   |                       | P4                          |                |   |  |                    |                                     |  |
| 11.70  |                |     |   |                       | D105                        |                | (5.50)  |  |                    |                                     |  |
| 12.00  |                |     |   |                       |                             |                |   |  |                    |                                     |  |
|  |                |     | 0                                       | 0                     |                             |                |   |  |                    |                                     |  |
| 13.15  |                |     |   |                       | P5                          |                |   | At 13.00m; very thin bed ironstone (60mm).   |                    |                                     |  |
| 13.70  | Sample / Tests |     | Casing<br>Depth<br>(m)                  | Water<br>Depth<br>(m) |                             | 79.20          | 13.70   | Weak thinly laminated dark grey to black carbonaceous<br>MUDSTONE with rare very thin beds ironstone (30mm).<br>Fractures: Horizontal (0 to 15 degrees) extremely closely to<br>closely spaced, smooth, planar, occasionally stepped and<br>incipient to open. |                    |                                     |  |
| 14.70  | D106           |     |   |                       |                             |                | (1.30)  |  |                    |                                     |  |
| 14.90  | P6             |     |   |                       |                             |                |   |  |                    |                                     |  |
|  |                |     |   |                       | 07/09/2006:                 | 77.90          | 15.00   | Complete at 15.00m   |                    |                                     |  |
|  |                |     |   |                       | 07/09/2006:                 |                |   |  |                    |                                     |  |
| Remarks  |                |     |   |                       |                             |                |   | Scale<br>(approx)<br>1:50  | Logged<br>By<br>TL |                                     |  |
|  |                |     |   |                       |                             |                |   | Figure No.   |                    |                                     |  |