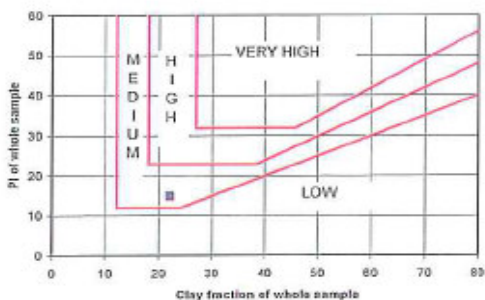


PARTICLE SIZE ANALYSIS

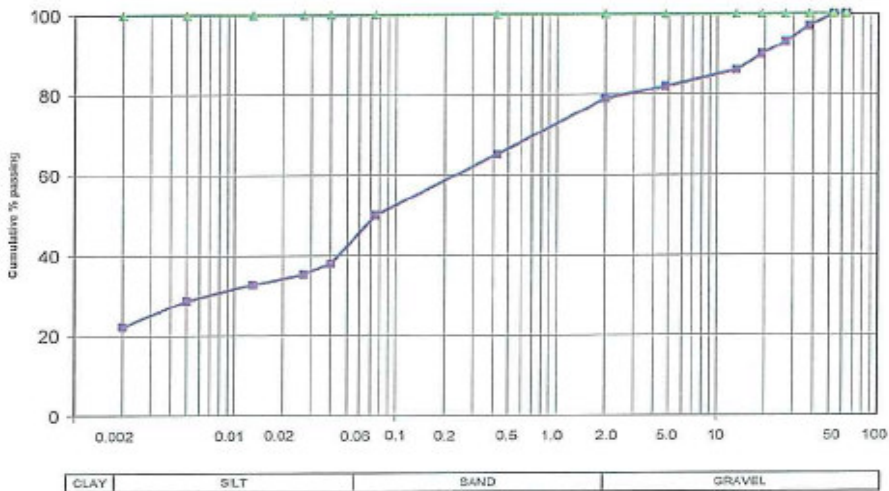
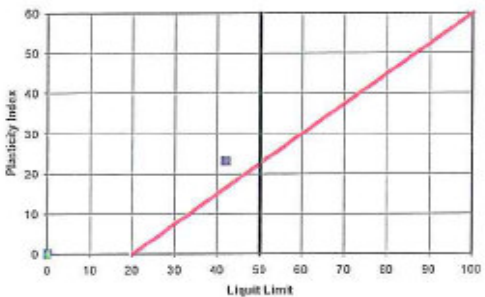
| | | |
|---|--|--|
| Sample No. | 23347 | |
| Soilab sample no. | S06-1035-11 | |
| Depth (m) | 1.5 | |
| Position | PL21 | |
| Material Description | PALE RED S/STONE SILTY SAND | |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | |
| 53.0 mm | 100 | |
| 37.5 mm | 97 | |
| 25.5 mm | 93 | |
| 19.0 mm | 90 | |
| 13.2 mm | 85 | |
| 4.75 mm | 82 | |
| 2.00 mm | 79 | |
| 0.425 mm | 65 | |
| 0.075 mm | 50 | |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 38 | |
| 0.027 mm | 35 | |
| 0.013 mm | 33 | |
| 0.005 mm | 29 | |
| 0.002 mm | 22 | |
| % Clay | 22 | |
| % Silt | 23 | |
| % Sand | 34 | |
| % Gravel | 21 | |
| ATTERBERG LIMITS | | |
| Liquid Limit | 42 | |
| Plasticity Index | 23 | |
| Linear Shrinkage (%) | 10.5 | |
| Grading Modulus | 1.05 | |
| Classification | A-7-5 (8) | |
| Unified Classification | CL | |
| Chart Reference | | |

PROJECT : PROJECT LIMA PHASE 2
 JOB NR. : S06-1035
 DATE : 2005-10-19

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



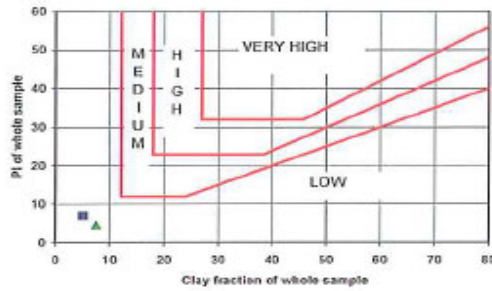
HIDROMETER/1035-04

PARTICLE SIZE ANALYSIS

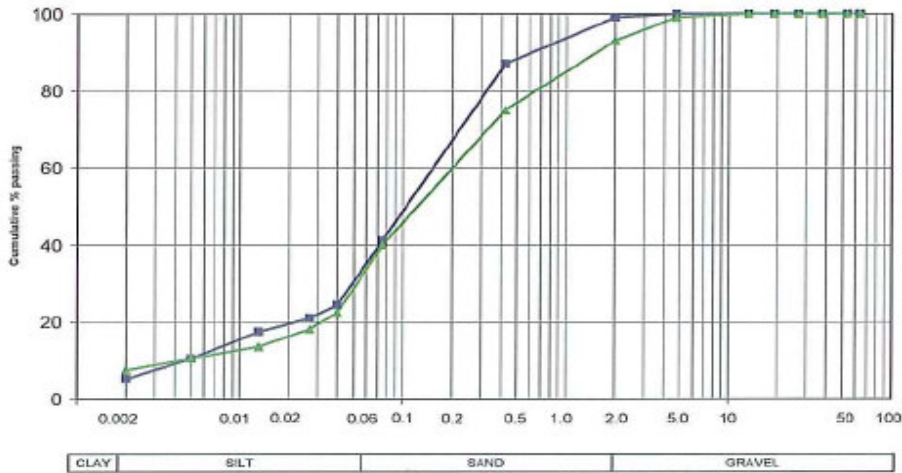
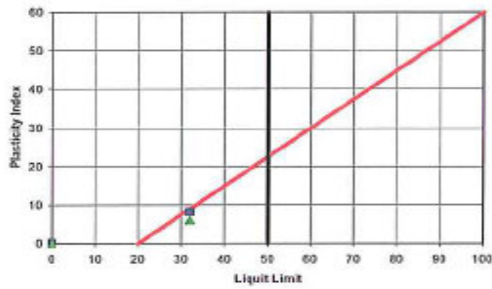
| | | |
|--|-------------------|--------------------|
| Sample No. | 24193 | 24194 |
| Soil lab sample no. | S06-1035A-01 | S06-1035A-02 |
| Depth (m) | 1.2 | 3.5 |
| Position | PL22 | PL23 |
| Material Description | PALE RED CHERT | DARK Y/O SHALES |
| | SILTY SAND | SILTY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 100 |
| 4.75 mm | 100 | 99 |
| 2.00 mm | 99 | 93 |
| 0.425 mm | 87 | 75 |
| 0.075 mm | 41 | 40 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 24 | 23 |
| 0.027 mm | 21 | 18 |
| 0.013 mm | 17 | 14 |
| 0.005 mm | 10 | 11 |
| 0.002 mm | 5 | 8 |
| % Clay | 5 | 8 |
| % Silt | 29 | 25 |
| % Sand | 65 | 61 |
| % Gravel | 1 | 7 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 32 | 32 |
| Plasticity Index | 8 | 5 |
| Linear Shrinkage (%) | 4.0 | 3.0 |
| Grading Modulus | 0.73 | 0.92 |
| Classification | A-4 (1) | A-4 (1) |
| Unified Classification | SC | |
| Chart Reference | ■-■-■ | ▲-▲-▲ |

PROJECT : PROJECT LIMA (STEELPOORT PSS) PHASE
 JOB NR. : S06-1035A
 DATE : 2008-11-08

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



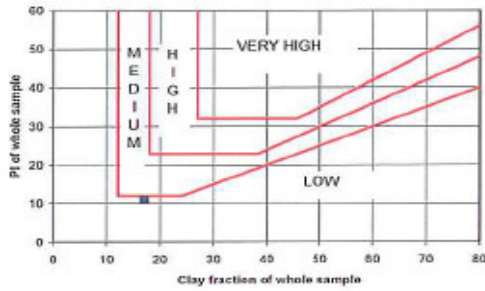
HIDROMETER 1035A.01

PARTICLE SIZE ANALYSIS

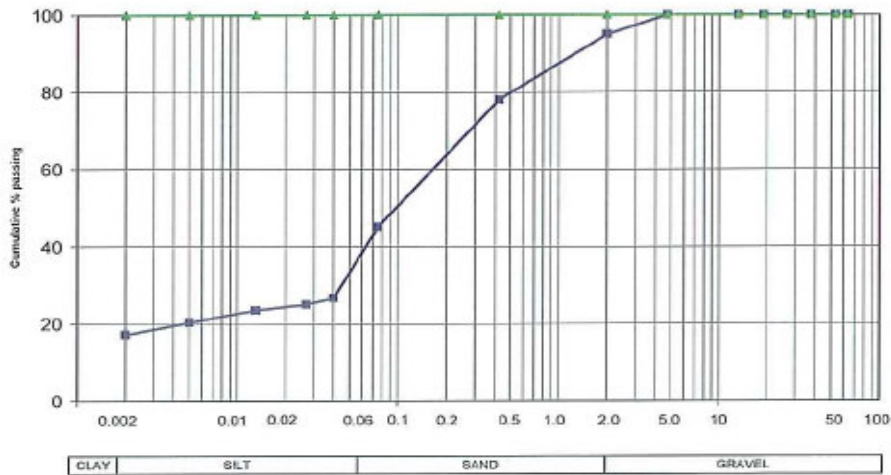
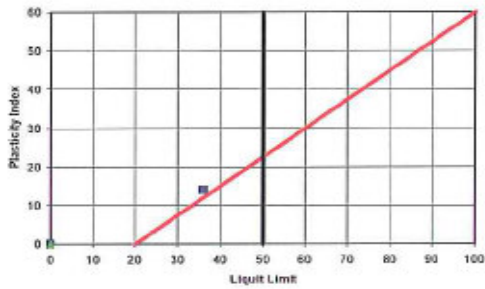
| | | |
|--|------------------|-------|
| Sample No. | 24201 | |
| Soillab sample no. | S06-1035-09 | |
| Depth (m) | | |
| Position | PL24, PL25, PL26 | |
| Material Description | DARK R/O SHALE | |
| | SILTY SAND | |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | |
| 53.0 mm | 100 | |
| 37.5 mm | 100 | |
| 28.5 mm | 100 | |
| 19.0 mm | 100 | |
| 13.2 mm | 100 | |
| 4.75 mm | 100 | |
| 2.00 mm | 95 | |
| 0.425 mm | 78 | |
| 0.075 mm | 45 | |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 27 | |
| 0.027 mm | 25 | |
| 0.013 mm | 23 | |
| 0.005 mm | 20 | |
| 0.002 mm | 17 | |
| % Clay | 17 | |
| % Silt | 20 | |
| % Sand | 58 | |
| % Gravel | 5 | |
| ATTERBERG LIMITS | | |
| Liquid Limit | 35 | |
| Plasticity Index | 14 | |
| Linear Shrinkage (%) | 6.5 | |
| Grading Modulus | 0.82 | |
| Classification | A-6 (3) | |
| Unified Classification | SC | |
| Chart Reference | ■-■-■ | ▲-▲-▲ |

PROJECT : PROJECT LIMA (STEELPOORT PSS) PHASE
 JOB NR. : S06-1035A
 DATE : 2006-11-08

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



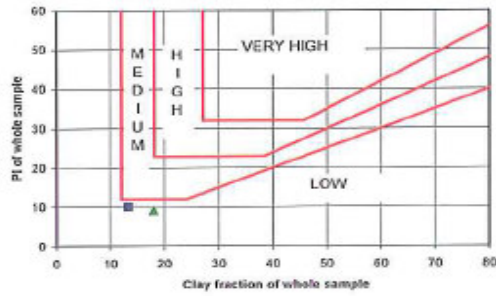
HYDROMETER/1035A-05

PARTICLE SIZE ANALYSIS

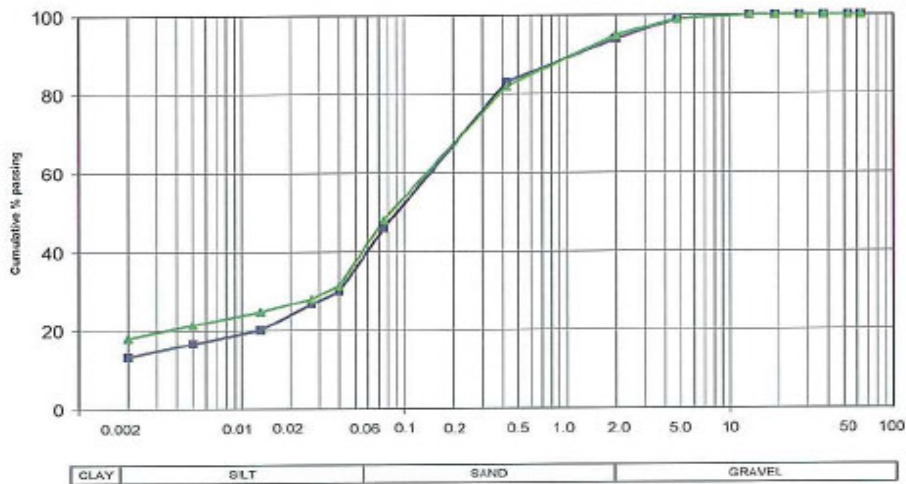
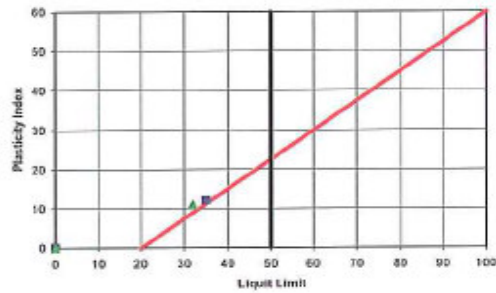
| | | |
|---|--------------------|------------------------|
| Sample No. | 24195 | 24196 |
| Soillab sample no. | S06-1035A-03 | S06-1035A-04 |
| Depth (m) | 0.5-3.0 | 0.5-4.0 |
| Position | PL27 | PL28 |
| Material Description | DARK Y/O SHALES | DARK Y/O FERRICRETE |
| | SILTY SAND | SILTY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 100 |
| 4.75 mm | 99 | 99 |
| 2.00 mm | 94 | 95 |
| 0.425 mm | 83 | 82 |
| 0.075 mm | 46 | 48 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 30 | 31 |
| 0.027 mm | 27 | 28 |
| 0.013 mm | 20 | 25 |
| 0.005 mm | 17 | 21 |
| 0.002 mm | 13 | 18 |
| % Clay | 13 | 18 |
| % Silt | 26 | 23 |
| % Sand | 55 | 54 |
| % Gravel | 6 | 5 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 35 | 32 |
| Plasticity Index | 12 | 11 |
| Linear Shrinkage (%) | 6.0 | 5.0 |
| Grading Modulus | 0.77 | 0.75 |
| Classification | A-6 (3) | A-6 (3) |
| Unified Classification | SC | SC |
| Chart Reference | ■-■-■ | ▲-▲-▲ |

PROJECT : PROJECT LIMA (STEELPOORT PSS) PHASE
 JOB NR. : S06-1035A
 DATE : 2006-11-08

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



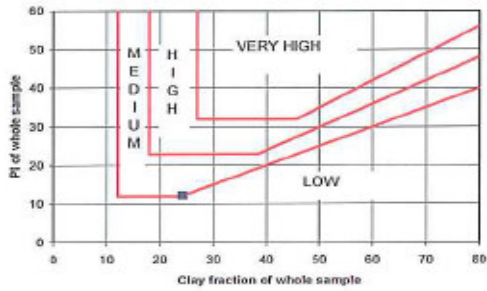
H.DROMETER-1035A-02

PARTICLE SIZE ANALYSIS

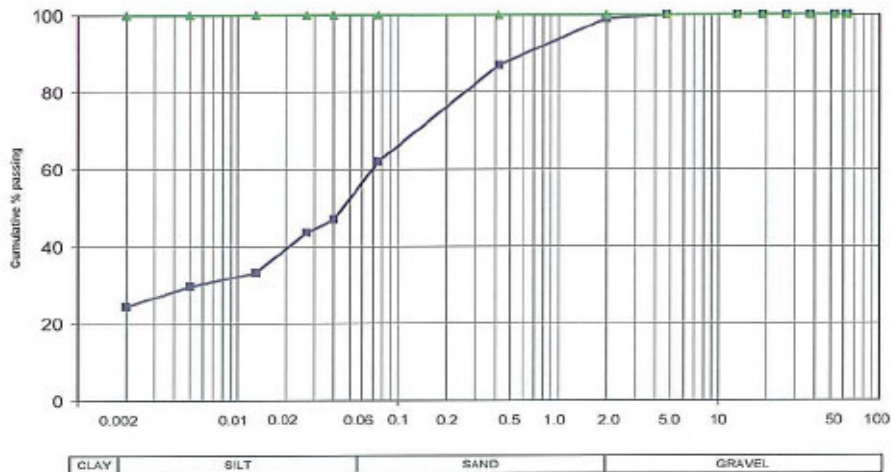
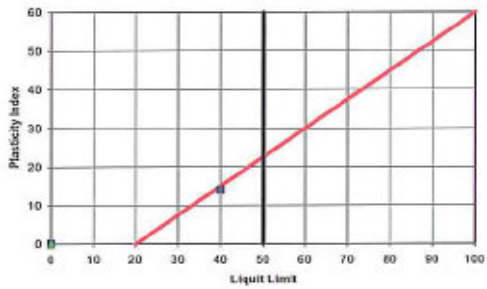
| | |
|--|----------------------------------|
| Sample No. | 24198 |
| Soillab sample no. | S06-1035A-06 |
| Depth (m) | 1.4-2.8 |
| Position | PL30 |
| Material Description | DARK R/O SHALE SILTY SAND |
| Moisture (%) | |
| SG | |
| SCREEN ANALYSIS (% PASSING) | |
| 63.0 mm | 100 |
| 53.0 mm | 100 |
| 37.5 mm | 100 |
| 28.5 mm | 100 |
| 19.0 mm | 100 |
| 13.2 mm | 100 |
| 4.75 mm | 100 |
| 2.00 mm | 99 |
| 0.425 mm | 87 |
| 0.075 mm | 62 |
| HYDROMETER ANALYSIS (% PASSING) | |
| 0.040 mm | 47 |
| 0.027 mm | 44 |
| 0.013 mm | 33 |
| 0.005 mm | 30 |
| 0.002 mm | 24 |
| % Clay | 24 |
| % Silt | 31 |
| % Sand | 43 |
| % Gravel | 1 |
| ATTERBERG LIMITS | |
| Liquid Limit | 40 |
| Plasticity Index | 14 |
| Linear Shrinkage (%) | 6.5 |
| Grading Modulus | 0.52 |
| Classification | A-6 (7) |
| Unified Classification | ML |
| Chart Reference | ■-■-■ ▲-▲-▲ |

PROJECT : PROJECT LIMA (STEELPOORT PSS) PHASE
 JOB NR. : S06-1035A
 DATE : 2006-11-08

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



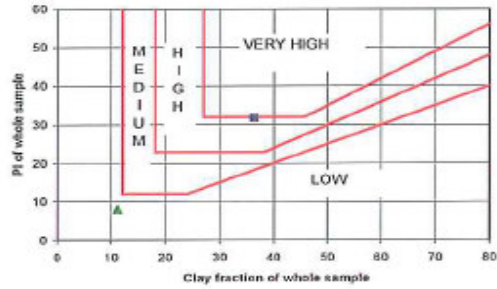
HIDROMETER/1035A-03

PARTICLE SIZE ANALYSIS

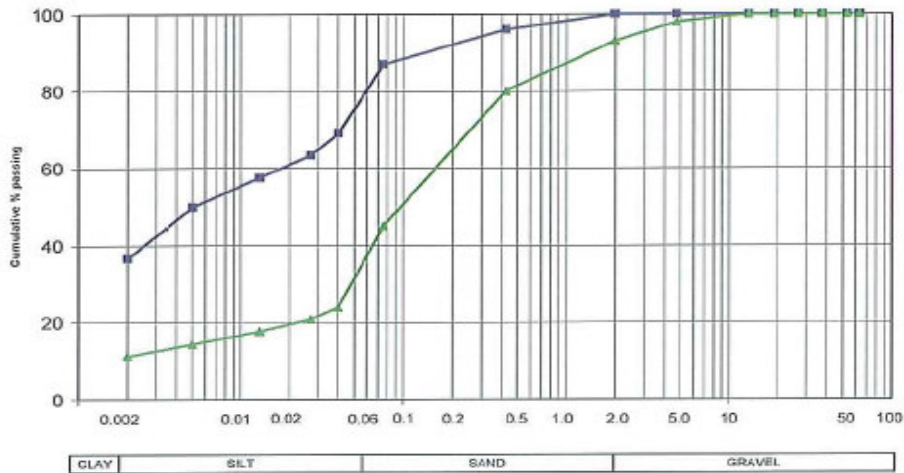
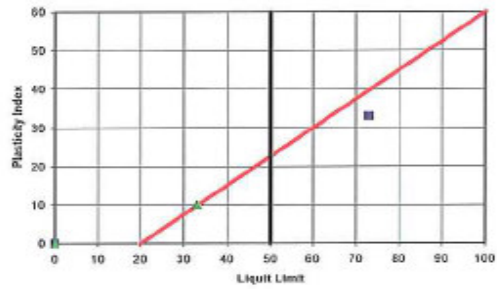
| Sample No. | 24199 | 24200 |
|---|------------------------------------|---------------------------------------|
| Soillab sample no. | S06-1035A-07 | S06-1035A-08 |
| Depth (m) | 2.8-5.0 | 0.2-2.7 |
| Position | PL31 | PL32 |
| Material Description | DUSKY RED SHALE CLAYEY SILT | DARK R/O FERRICRETE SILTY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 25.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 100 |
| 4.75 mm | 100 | 98 |
| 2.00 mm | 100 | 93 |
| 0.425 mm | 98 | 80 |
| 0.075 mm | 87 | 45 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 68 | 24 |
| 0.027 mm | 63 | 21 |
| 0.013 mm | 58 | 18 |
| 0.005 mm | 50 | 14 |
| 0.002 mm | 36 | 11 |
| % Clay | 36 | 11 |
| % Silt | 43 | 25 |
| % Sand | 21 | 57 |
| % Gravel | 0 | 7 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 73 | 33 |
| Plasticity Index | 33 | 10 |
| Linear Shrinkage (%) | 15.5 | 5.0 |
| Grading Modulus | 0.17 | 0.82 |
| Classification | A-7-5 (20) | A-4 (2) |
| Unified Classification | MH | SC |
| Chart Reference | ■-■-■ | ▲-▲-▲ |

PROJECT : PROJECT LIMA (STEELPOORT PSS) PHASE
 JOB NR. : S06-1035A
 DATE : 2006-11-08

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



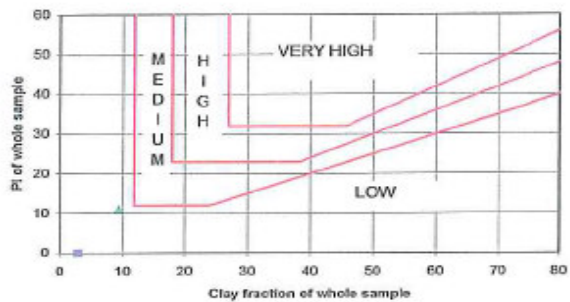
HIDROMETER/1035A-04

PARTICLE SIZE ANALYSIS

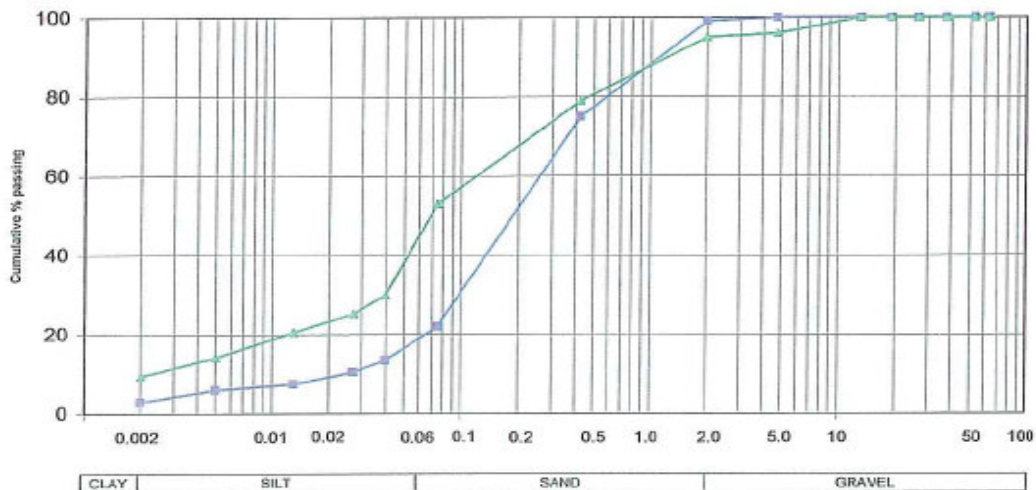
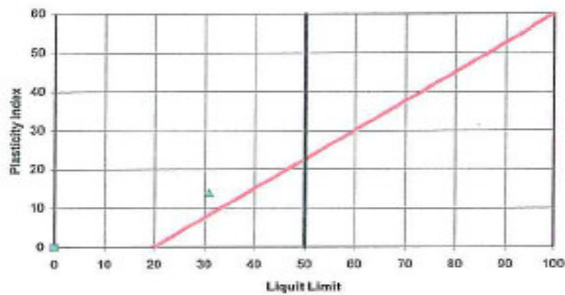
| Sample No. | 23169 | 23170 |
|--|-------------------------|-------------------------|
| Soillab sample no. | S06-0954-01 | S06-0954-02 |
| Depth (m) | 1.0 | 3.0 |
| Position | PL1 | PL2 |
| Material Description | DUSKY RED FERRICRETE | DUSKY RED FERRICRETE |
| | SILTY SAND | SILTY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 100 |
| 4.75 mm | 100 | 96 |
| 2.00 mm | 99 | 95 |
| 0.425 mm | 75 | 79 |
| 0.075 mm | 22 | 53 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 14 | 30 |
| 0.027 mm | 11 | 25 |
| 0.013 mm | 8 | 21 |
| 0.005 mm | 6 | 14 |
| 0.002 mm | 3 | 9 |
| % Clay | 3 | 9 |
| % Silt | 15 | 34 |
| % Sand | 81 | 52 |
| % Gravel | 1 | 5 |
| ATTERBERG LIMITS | | |
| Liquid Limit | | 31 |
| Plasticity Index | SP | 14 |
| Linear Shrinkage (%) | 1.0 | 7.0 |
| Grading Modulus | 1.04 | 0.73 |
| Classification | A-2-4 (0) | A-5 (5) |
| Unified Classification | SC | CL |
| Chart Reference | ■—■ | ▲—▲ |

PROJECT : STEELPOORT PSS
 JOB NR. : S06-0954
 DATE : 2006-09-28

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



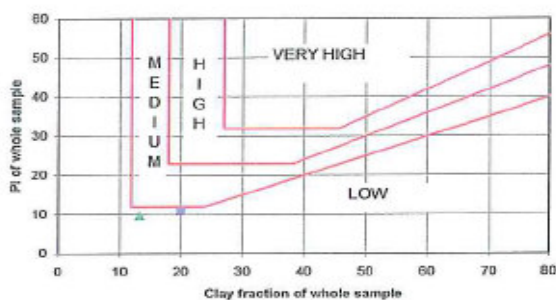
HIDROMETER/0954-01

PARTICLE SIZE ANALYSIS

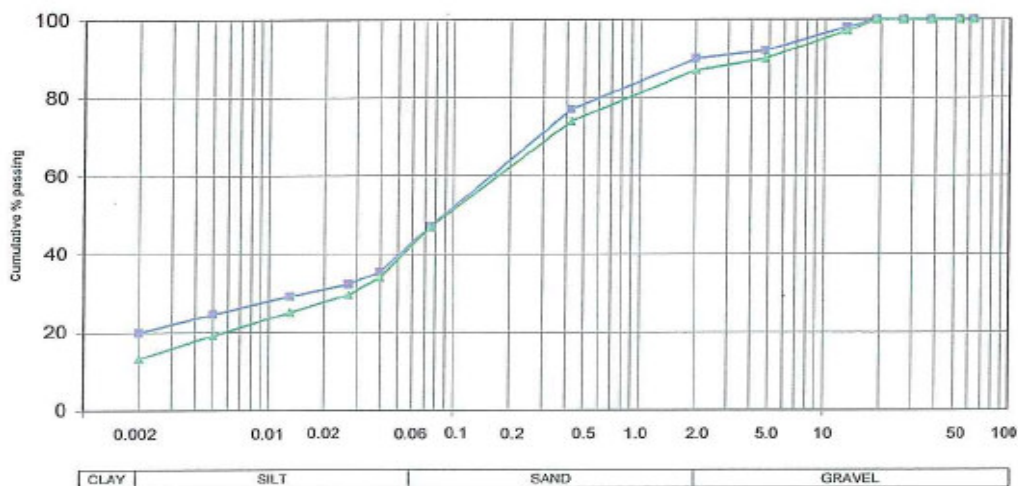
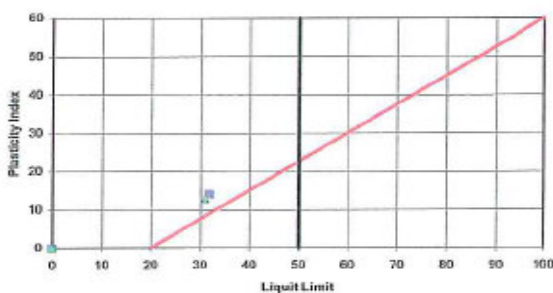
| Sample No. | 23171 | 23172 |
|---|-------------------------|-------------------------|
| Soillab sample no. | S06-0954-03 | S06-0954-04 |
| Depth (m) | 0.5 | 4.0 |
| Position | PL3 | PL4 |
| Material Description | DUSKY RED FERRICRETE | DUSKY RED FERRICRETE |
| | SILTY SAND | SILTY SAND |
| Moisture (%) | | |
| SC | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 98 | 97 |
| 4.75 mm | 92 | 90 |
| 2.00 mm | 90 | 87 |
| 0.425 mm | 77 | 74 |
| 0.075 mm | 47 | 47 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 35 | 34 |
| 0.027 mm | 32 | 30 |
| 0.013 mm | 29 | 25 |
| 0.005 mm | 25 | 19 |
| 0.002 mm | 20 | 13 |
| % Clay | 20 | 13 |
| % Silt | 22 | 28 |
| % Sand | 48 | 46 |
| % Gravel | 10 | 13 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 32 | 31 |
| Plasticity Index | 14 | 13 |
| Linear Shrinkage (%) | 6.5 | 6.5 |
| Grading Modulus | 0.86 | 0.92 |
| Classification | A-6 (4) | A-6 (3) |
| Unified Classification | SC | SC |
| Chart Reference | ■—■ | ▲—▲ |

PROJECT : STEELPOORT PSS
 JOB NR. : S06-0954
 DATE : 2006-09-28

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



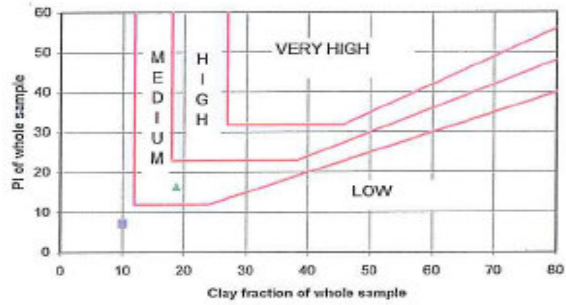
HYDROMETER/0954-02

PARTICLE SIZE ANALYSIS

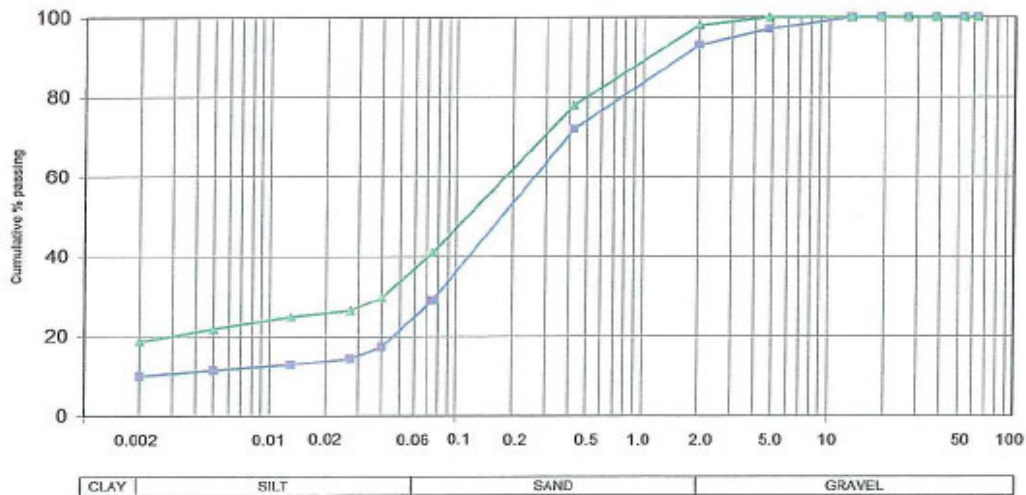
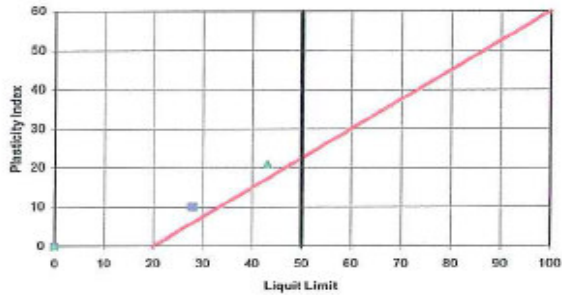
| | | |
|---|---|--|
| Sample No. | 23173 | 23174 |
| Soillab sample no. | S06-0954-05 | S06-0954-06 |
| Depth (m) | 0.5 | 0.55 |
| Position | PL5 | PL6 |
| Material Description | DARK BROWN FERRICRETE SILTY SAND | DARK BROWN FERRICRETE CLAYEY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 100 |
| 4.75 mm | 97 | 100 |
| 2.00 mm | 93 | 98 |
| 0.425 mm | 72 | 78 |
| 0.075 mm | 29 | 41 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 17 | 30 |
| 0.027 mm | 14 | 27 |
| 0.013 mm | 13 | 25 |
| 0.005 mm | 12 | 22 |
| 0.002 mm | 10 | 19 |
| % Clay | 10 | 19 |
| % Silt | 14 | 17 |
| % Sand | 69 | 62 |
| % Gravel | 7 | 2 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 28 | 43 |
| Plasticity Index | 10 | 21 |
| Linear Shrinkage (%) | 5.0 | 9.5 |
| Grading Modulus | 1.06 | 0.83 |
| Classification | A-2-4 (0) | A-7-6 (4) |
| Unified Classification | SC | SC |
| Chart Reference | | |

PROJECT : STEELPOORT PSS
 JOB NR. : S06-0954
 DATE : 2006-09-28

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



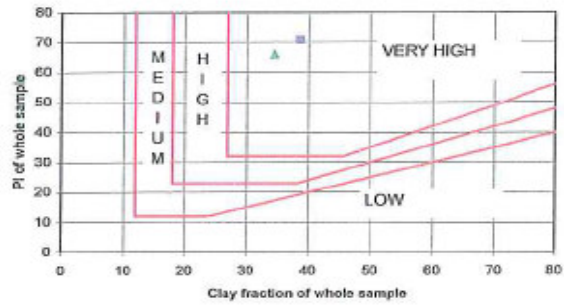
HIDROMETER0054-03

PARTICLE SIZE ANALYSIS

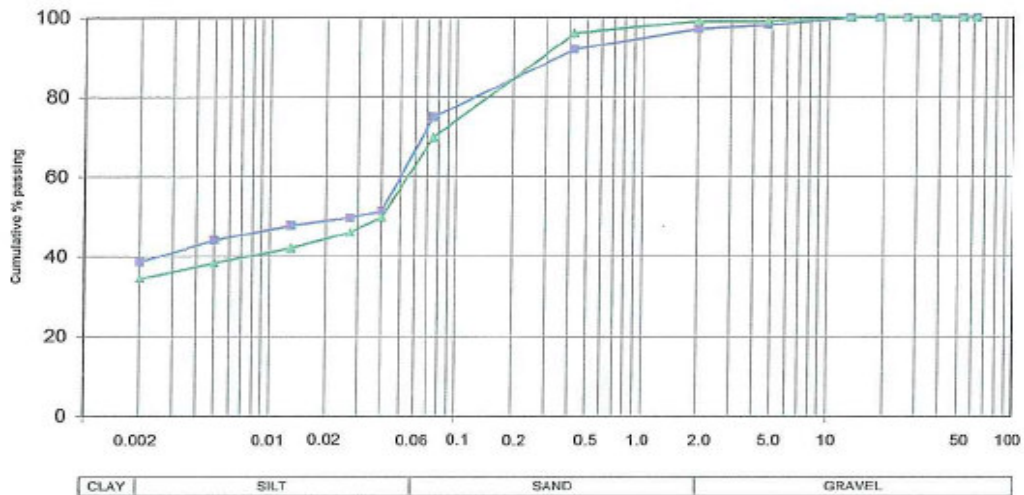
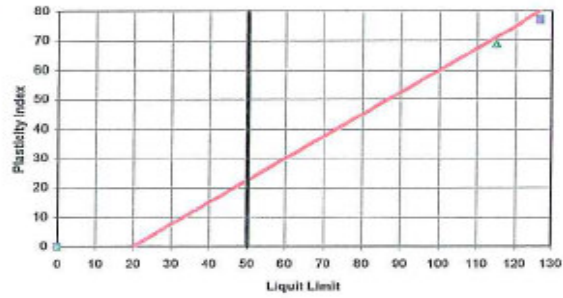
| Sample No. | 23175 | 23176 |
|---|---------------------------------------|--|
| Soillab sample no. | S06-0954-07 | S06-0954-08 |
| Depth (m) | 2.7 | 2.75 |
| Position | PL7 | PL8 |
| Material Description | DARK GREY QUARTZITE SANDY CLAY | DARK GREY QUARTZITE CLAYEY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 100 |
| 4.75 mm | 98 | 99 |
| 2.00 mm | 97 | 99 |
| 0.425 mm | 92 | 96 |
| 0.075 mm | 75 | 70 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 52 | 50 |
| 0.027 mm | 50 | 46 |
| 0.013 mm | 48 | 42 |
| 0.005 mm | 44 | 38 |
| 0.002 mm | 39 | 35 |
| % Clay | 39 | 35 |
| % Silt | 26 | 27 |
| % Sand | 32 | 38 |
| % Gravel | 3 | 1 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 127 | 115 |
| Plasticity Index | 77 | 69 |
| Linear Shrinkage (%) | 18.0 | 21.5 |
| Grading Modulus | 0.36 | 0.35 |
| Classification | A-7-5 (20) | A-7-5 (19) |
| Unified Classification | MH | MH |
| Chart Reference | | |

PROJECT : STEELPOORT PSS
 JOB NR. : S06-0954
 DATE : 2006-09-28

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



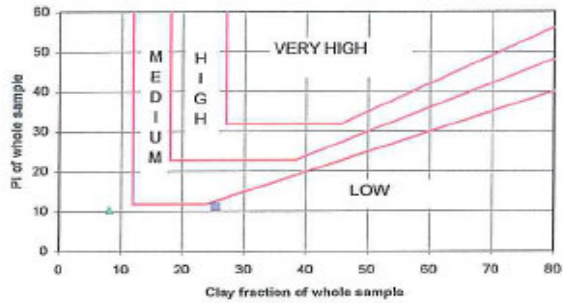
HDRMETER0954-04

PARTICLE SIZE ANALYSIS

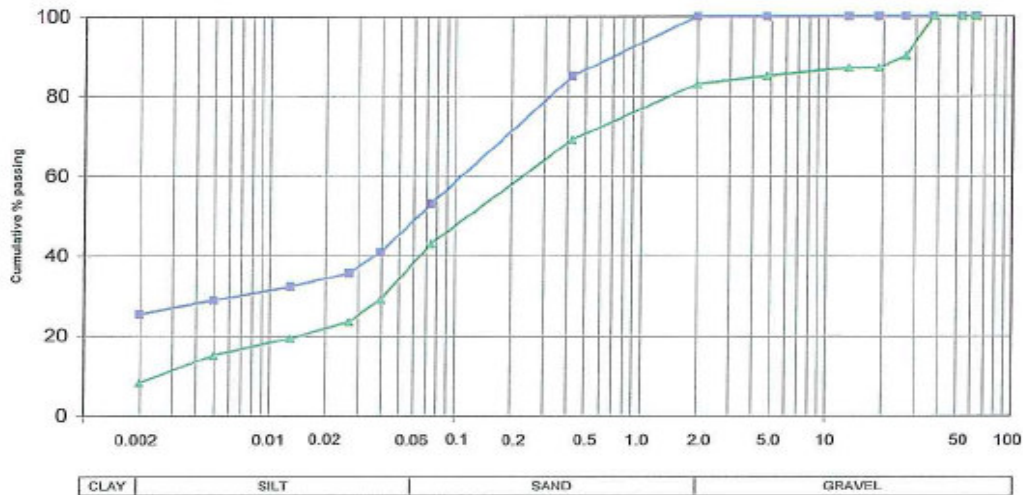
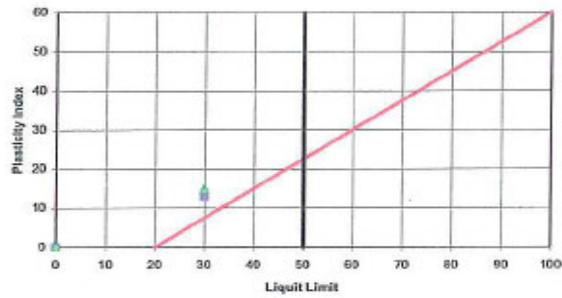
| | | |
|---|---|--|
| Sample No. | 23177 | 23178 |
| Soillab sample no. | S06-0954-09 | S06-0954-10 |
| Depth (m) | 0.55 | 4.1 |
| Position | PL9 | PL10 |
| Material Description | DUSKY RED FERRICRETE CLAYEY SAND | DUSKY RED FERRICRETE SILTY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 53.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 90 |
| 19.0 mm | 100 | 87 |
| 13.2 mm | 100 | 87 |
| 4.75 mm | 100 | 85 |
| 2.00 mm | 100 | 83 |
| 0.425 mm | 85 | 69 |
| 0.075 mm | 53 | 43 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 41 | 29 |
| 0.027 mm | 36 | 23 |
| 0.013 mm | 32 | 19 |
| 0.005 mm | 29 | 15 |
| 0.002 mm | 26 | 8 |
| % Clay | 26 | 8 |
| % Silt | 22 | 28 |
| % Sand | 52 | 46 |
| % Gravel | 0 | 17 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 30 | 30 |
| Plasticity Index | 13 | 15 |
| Linear Shrinkage (%) | 6.5 | 7.0 |
| Grading Modulus | 0.62 | 1.05 |
| Classification | A-5 (5) | A-6 (3) |
| Unified Classification | CL | SC |
| Chart Reference | ■—■ | ▲—▲ |

PROJECT : STEELPOORT PSS
 JOB NR. : S06-0954
 DATE : 2006-09-28

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



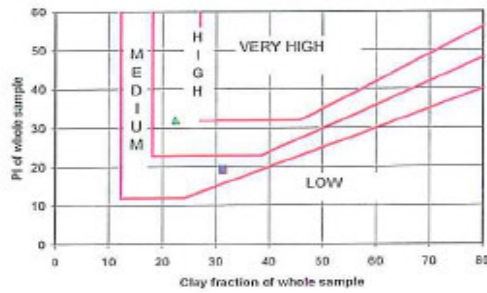
HIDROMETER/0954-05

PARTICLE SIZE ANALYSIS

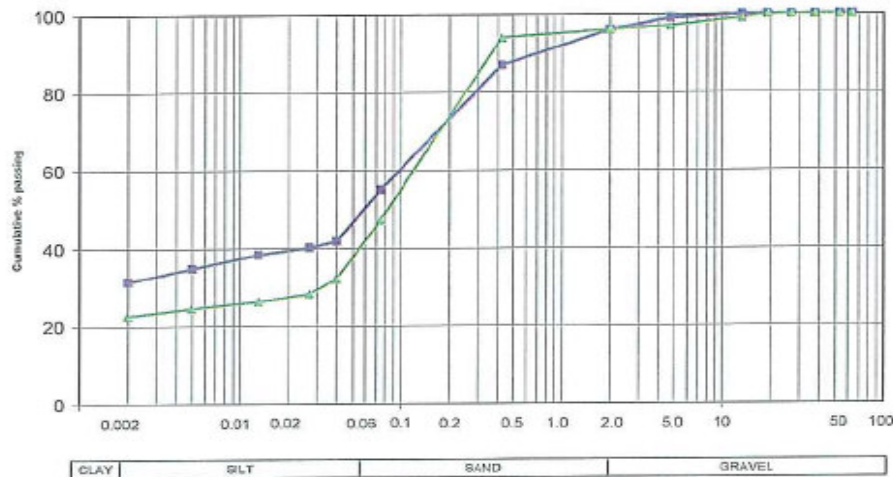
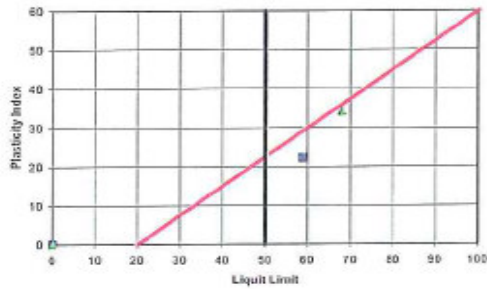
| | | |
|--|--|--|
| Sample No. | 23341 | 23342 |
| Soillab sample no. | S06-1035-02 | S06-1035-04 |
| Depth (m) | 0.55 | 1.7 |
| Position | PL12 | PL14 |
| Material Description | DARK BROWN FERRICRETE CLAYEY SAND | DARK GREY QUARTZITE CLAYEY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 99 |
| 4.75 mm | 99 | 97 |
| 2.00 mm | 95 | 96 |
| 0.425 mm | 87 | 94 |
| 0.075 mm | 55 | 47 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 42 | 32 |
| 0.027 mm | 40 | 28 |
| 0.013 mm | 38 | 26 |
| 0.005 mm | 35 | 24 |
| 0.002 mm | 31 | 23 |
| % Clay | 31 | 23 |
| % Silt | 18 | 18 |
| % Sand | 47 | 55 |
| % Gravel | 4 | 4 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 59 | 65 |
| Plasticity Index | 22 | 34 |
| Linear Shrinkage (%) | 10.0 | 15.5 |
| Grading Modulus | 0.62 | 0.63 |
| Classification | A-7-5 (11) | A-7-5 (10) |
| Unified Classification | MH | SC |
| Chart Reference | ■-■-■ | ▲-▲-▲ |

PROJECT : PROJECT LIMA PHASE 2
 JOB NR. : S06-1035
 DATE : 2006-10-19

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



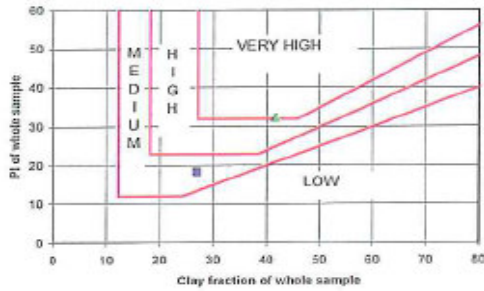
HOROMETER 1325-01

PARTICLE SIZE ANALYSIS

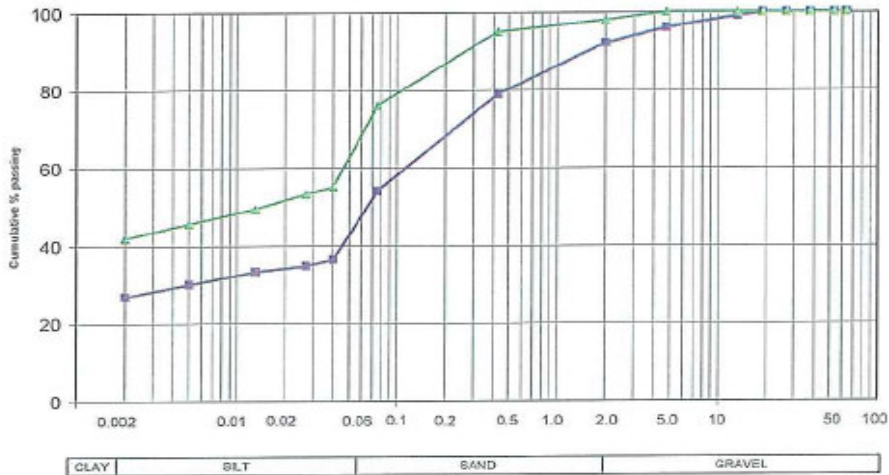
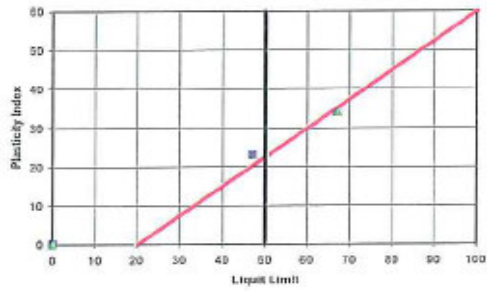
| | | |
|--|---|--|
| Sample No. | 23343 | 23344 |
| Soillab sample no. | S06-1035-06 | S06-1035-07 |
| Depth (m) | 0.3 | 1.5 |
| Position | PL15 | PL17 |
| Material Description | DARK BROWN CHERT CLAYEY SAND | DARK BROWN S/STONE SANDY CLAY |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 99 | 100 |
| 4.75 mm | 96 | 100 |
| 2.00 mm | 92 | 98 |
| 0.425 mm | 79 | 95 |
| 0.075 mm | 54 | 76 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 36 | 55 |
| 0.027 mm | 35 | 53 |
| 0.013 mm | 33 | 49 |
| 0.005 mm | 30 | 46 |
| 0.002 mm | 27 | 42 |
| % Clay | 27 | 42 |
| % Silt | 20 | 25 |
| % Sand | 46 | 31 |
| % Gravel | 8 | 2 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 47 | 67 |
| Plasticity Index | 23 | 34 |
| Linear Shrinkage (%) | 11.0 | 15.0 |
| Grading Modulus | 0.75 | 0.31 |
| Classification | A-7-5 (10) | A-7-5 (20) |
| Unified Classification | CL | MH |
| Chart Reference | ■-■-■ | ▲-▲-▲ |

PROJECT : PROJECT LIMA PHASE 2
 JOB NR. : S06-1035
 DATE : 2006-10-19

POTENTIAL EXPANSIVENESS



PLASTICITY CHART



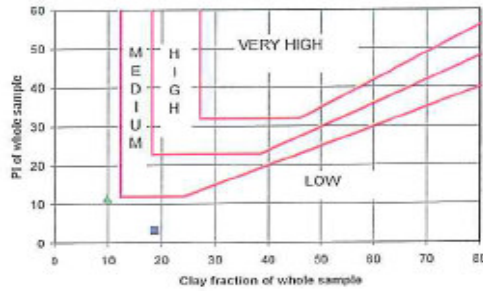
HYDROMETER/1035-02

PARTICLE SIZE ANALYSIS

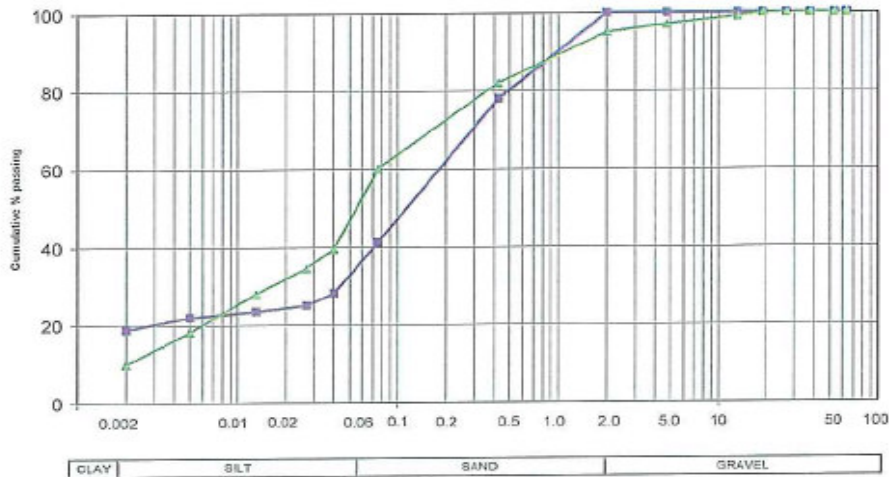
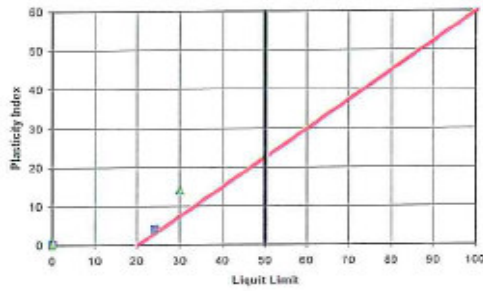
| | | |
|--|--|-------------------------------------|
| Sample No. | 23345 | 23346 |
| Soillab sample no. | S06-1035-09 | S06-1035-10 |
| Depth (m) | 0.5 | 2.0 |
| Position | PL19 | PL20 |
| Material Description | DARK BROWN FERRICRETE CLAYEY SAND | DUSKY RED S/STONE SILTY SAND |
| Moisture (%) | | |
| SG | | |
| SCREEN ANALYSIS (% PASSING) | | |
| 63.0 mm | 100 | 100 |
| 53.0 mm | 100 | 100 |
| 37.5 mm | 100 | 100 |
| 26.5 mm | 100 | 100 |
| 19.0 mm | 100 | 100 |
| 13.2 mm | 100 | 99 |
| 4.75 mm | 100 | 97 |
| 2.00 mm | 100 | 95 |
| 0.425 mm | 78 | 82 |
| 0.075 mm | 41 | 60 |
| HYDROMETER ANALYSIS (% PASSING) | | |
| 0.040 mm | 28 | 39 |
| 0.027 mm | 25 | 34 |
| 0.013 mm | 23 | 28 |
| 0.005 mm | 22 | 18 |
| 0.002 mm | 19 | 10 |
| % Clay | 19 | 10 |
| % Silt | 17 | 41 |
| % Sand | 65 | 44 |
| % Gravel | 0 | 5 |
| ATTERBERG LIMITS | | |
| Liquid Limit | 24 | 30 |
| Plasticity Index | 4 | 14 |
| Linear Shrinkage (%) | 2.0 | 7.0 |
| Grading Modulus | 0.81 | 0.63 |
| Classification | A-4 (1) | A-6 (7) |
| Unified Classification | SP & SC | CL |
| Chart Reference | ■-■-■ | ▲-▲-▲ |

PROJECT : PROJECT LIMA PHASE 2
 JOB NR. : S06-1035
 DATE : 2006-10-19

POTENTIAL EXPANSIVENESS



PLASTICITY CHART

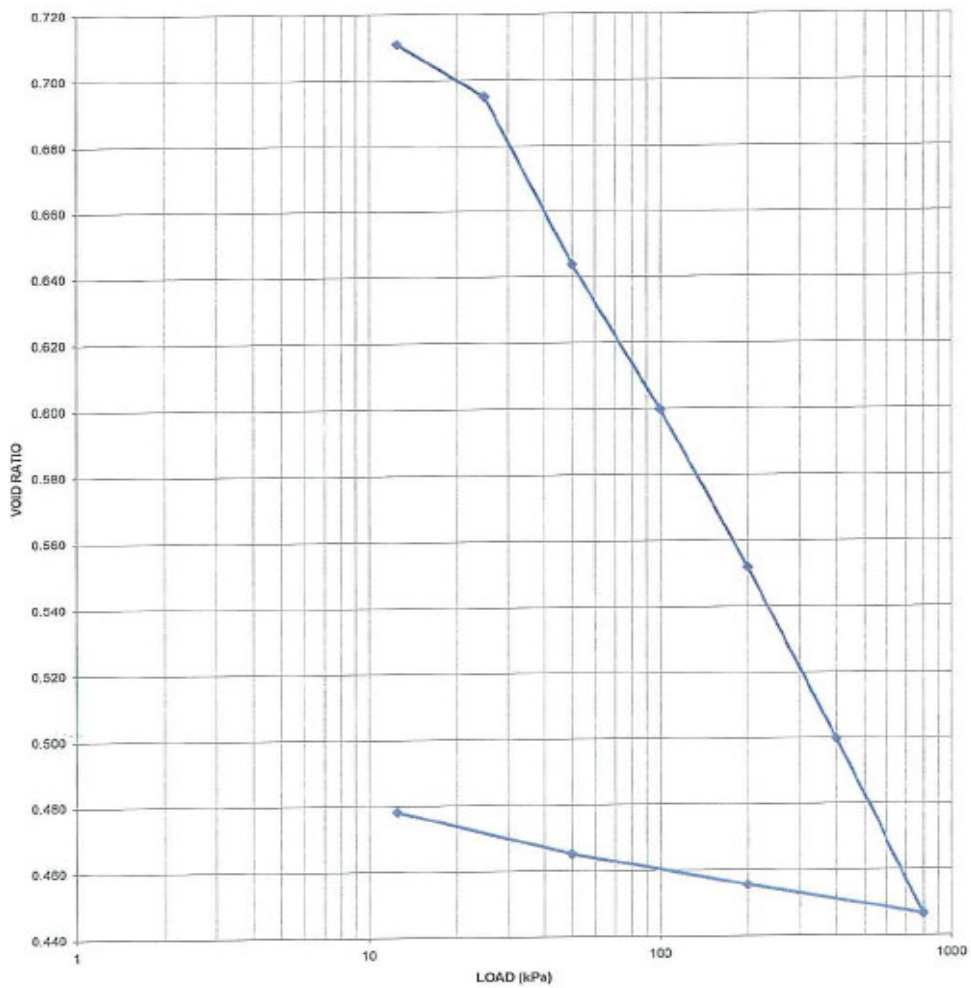


H:\DRUMETER\1035-09

CONSOLIDATION TEST

| | | | |
|--------------------------------|----------------|---|-------|
| PRCJECT: | STEELPOORT PSS | INITIAL DRY DENSITY (kg/m ³): | 2025 |
| SAMPLE NO.: | TPL 11 PL 5 | INITIAL MOISTURE CONTENT (%): | 4.8 |
| DEPTH (m): | 0.5 | MOISTURE CONTENT AFTER TEST (%): | 14.9 |
| INITIAL HEIGHT OF SAMPLE (mm): | 19.4 | RELATIVE DENSITY: | 3.39 |
| SAMPLE STATE: | UNDISTURBED | INITIAL VOID RATIO: | 0.674 |
| SOILLAB SAMPLE No.: | S06-0954-05 | VOID RATIO AFTER SOAKING: | 0.729 |
| | | SATURATION (%): | 113.5 |

| | | | | | | | | | | | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| LOAD (kPa): | 0 | W | 12.5 | 25 | 50 | 100 | 200 | 400 | 800 | 200 | 50 | 12.5 |
| HEIGHT (mm) | 19.400 | 20.034 | 19.826 | 19.640 | 19.048 | 18.536 | 17.982 | 17.378 | 16.760 | 16.864 | 16.976 | 17.128 |
| VOID RATIO: | 0.674 | 0.729 | 0.711 | 0.695 | 0.644 | 0.600 | 0.552 | 0.500 | 0.446 | 0.455 | 0.465 | 0.478 |

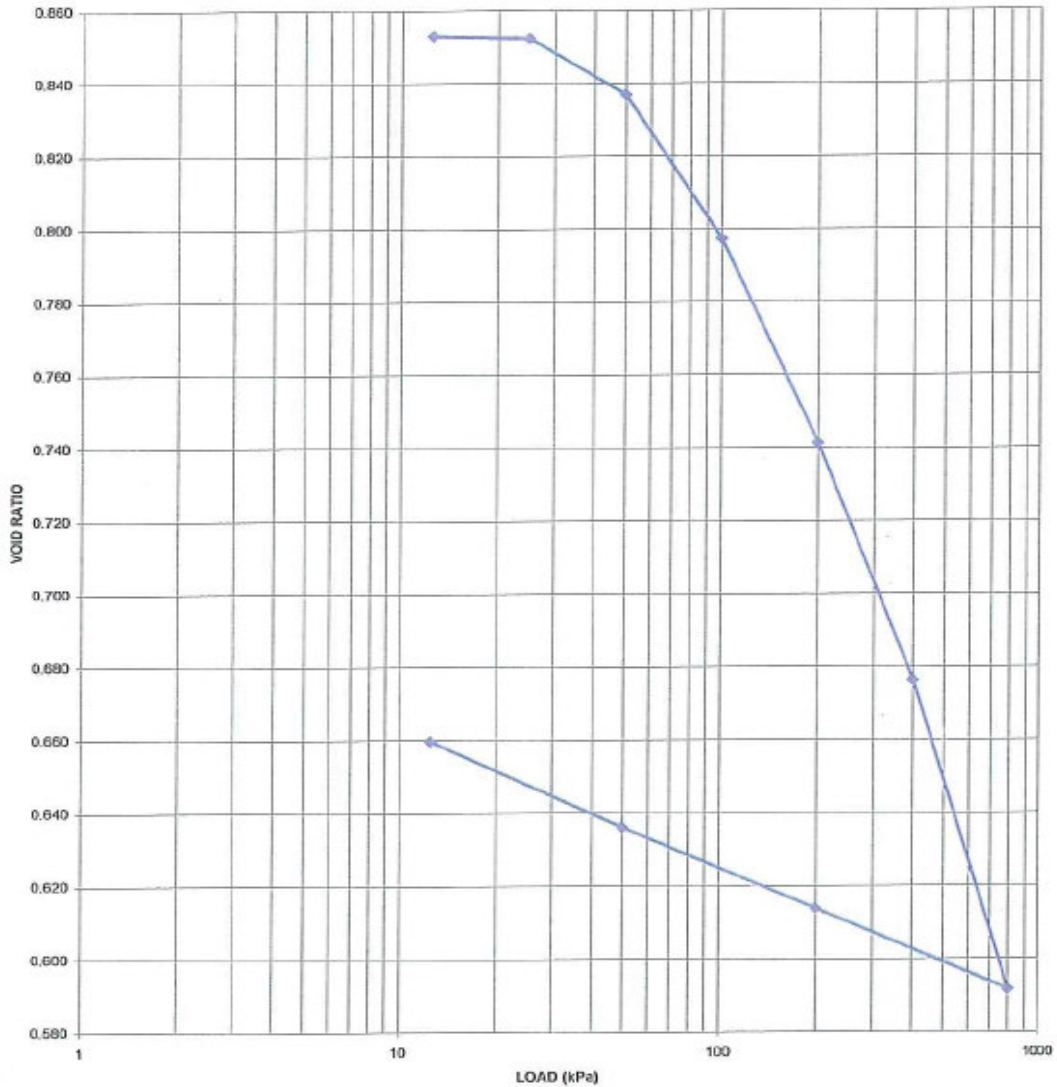


KONSOLIDASIE-GEWOON/0954-05

CONSOLIDATION TEST

| | | | |
|--------------------------------|----------------|---|-------|
| PROJECT: | STEELPOORT PSS | INITIAL DRY DENSITY (kg/m ³): | 1774 |
| SAMPLE NO: | PL 6 | INITIAL MOISTURE CONTENT (%): | 16.5 |
| DEPTH (m): | 0.55 | MOISTURE CONTENT AFTER TEST (%): | 23.2 |
| INITIAL HEIGHT OF SAMPLE (mm): | 19.4 | RELATIVE DENSITY: | 3.172 |
| SAMPLE STATE: | UNDISTURBED | INITIAL VOID RATIO: | 0.788 |
| SOILLAB SAMPLE No.: | S06-0954-06 | VOID RATIO AFTER SOAKING: | 0.856 |
| | | SATURATION (%): | 124.2 |

| | | | | | | | | | | | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| LOAD (kPa): | C | W | 12.5 | 25 | 50 | 100 | 200 | 400 | 800 | 200 | 50 | 12.5 |
| HEIGHT (mm) | 19.40C | 20.140 | 20.106 | 20.098 | 19.930 | 19.500 | 18.892 | 18.186 | 17.268 | 17.508 | 17.750 | 18.008 |
| VOID RATIO: | 0.788 | 0.856 | 0.853 | 0.852 | 0.837 | 0.797 | 0.741 | 0.676 | 0.591 | 0.614 | 0.636 | 0.660 |



KONS/KONSOLIDASIE-GEWOON/0954-06

TEST REPORT: S06-0954

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SOILLAB (PTY) LTD
Reg No 1971/000112/07

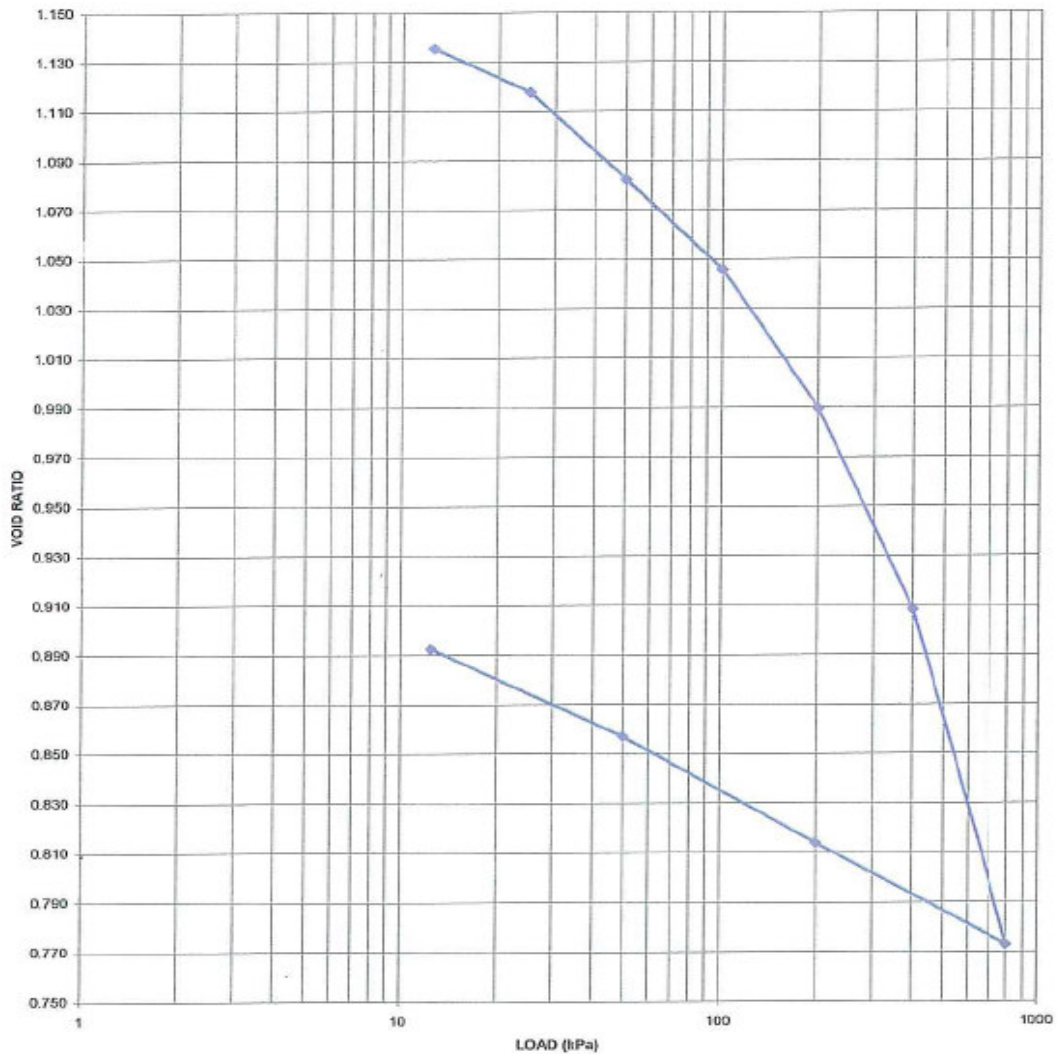
230 Albertus Street
La Montagne
Tel (012) 481-3999

P O Box 72928
Lynnwood Ridge 0040
Fax (012) 481-3812

CONSOLIDATION TEST

| | | | |
|--------------------------------|----------------|---|-------|
| PROJECT: | STEELPOORT PSS | INITIAL DRY DENSITY (kg/m ³): | 1386 |
| SAMPLE NO: | PL 6 | INITIAL MOISTURE CONTENT (%): | 29.2 |
| DEPTH (m): | 2.75 | MOISTURE CONTENT AFTER TEST (%): | 37.7 |
| INITIAL HEIGHT OF SAMPLE (mm): | 19.3 | RELATIVE DENSITY: | 2.669 |
| SAMPLE STATE: | UNDISTURBED | INITIAL VOID RATIO: | 0.925 |
| SOILLAB SAMPLE No.: | S06-0954-08 | VOID RATIO AFTER SOAKING: | 1.146 |
| | | SATURATION (%): | 130.3 |

| | | | | | | | | | | | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| LOAD (kPa): | 0 | W | 12.5 | 25 | 50 | 100 | 200 | 400 | 800 | 200 | 50 | 12.5 |
| HEIGHT (mm) | 19.300 | 21.510 | 21.408 | 21.230 | 20.874 | 20.508 | 19.944 | 19.128 | 17.770 | 18.182 | 18.614 | 18.970 |
| VOID RATIO: | 0.925 | 1.146 | 1.135 | 1.118 | 1.062 | 1.046 | 0.989 | 0.908 | 0.773 | 0.814 | 0.857 | 0.892 |



KONSKONSOLIDASIE-GEW00N0954-08

TEST REPORT: S06-0954

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SOILLAB (PTY) LTD
Reg No 1971/000112/07

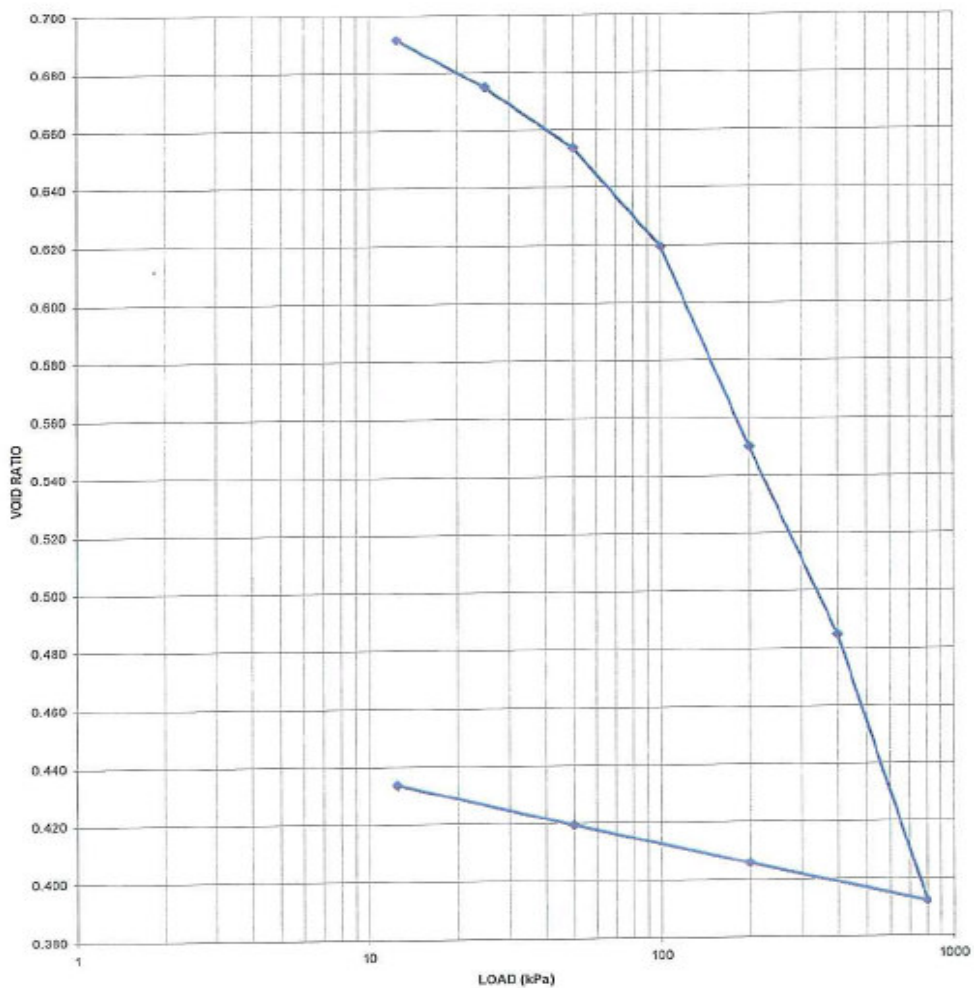
230 Albertus Street
La Montagne
Tel (012) 481-3999

P O Box 72928
Lynnwood Ridge 0040
Fax (012) 481-3812

CONSOLIDATION TEST

| | | | |
|--------------------------------|----------------|---|-------|
| PROJECT: | STEELPOORT PSS | INITIAL DRY DENSITY (kg/m ³): | 1616 |
| SAMPLE NO: | PL 9 | INITIAL MOISTURE CONTENT (%): | 11.7 |
| DEPTH (m): | 0.55 | MOISTURE CONTENT AFTER TEST (%): | 16.7 |
| INITIAL HEIGHT OF SAMPLE (mm): | 19.3 | RELATIVE DENSITY: | 2.76 |
| SAMPLE STATE: | UNDISTURBED | INITIAL VOID RATIO: | 0.708 |
| SOILLAB SAMPLE No.: | S06-0954-09 | VOID RATIO AFTER SOAKING: | 0.703 |
| | | SATURATION (%): | 117.6 |

| | | | | | | | | | | | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| LOAD (kPa): | 0 | W | 12.5 | 25 | 50 | 100 | 200 | 400 | 800 | 200 | 50 | 12.5 |
| HEIGHT (mm) | 19.300 | 19.236 | 19.108 | 18.922 | 18.882 | 18.294 | 17.510 | 16.770 | 15.724 | 15.878 | 16.032 | 16.194 |
| VOID RATIO: | 0.708 | 0.703 | 0.691 | 0.675 | 0.654 | 0.619 | 0.550 | 0.484 | 0.392 | 0.405 | 0.419 | 0.433 |

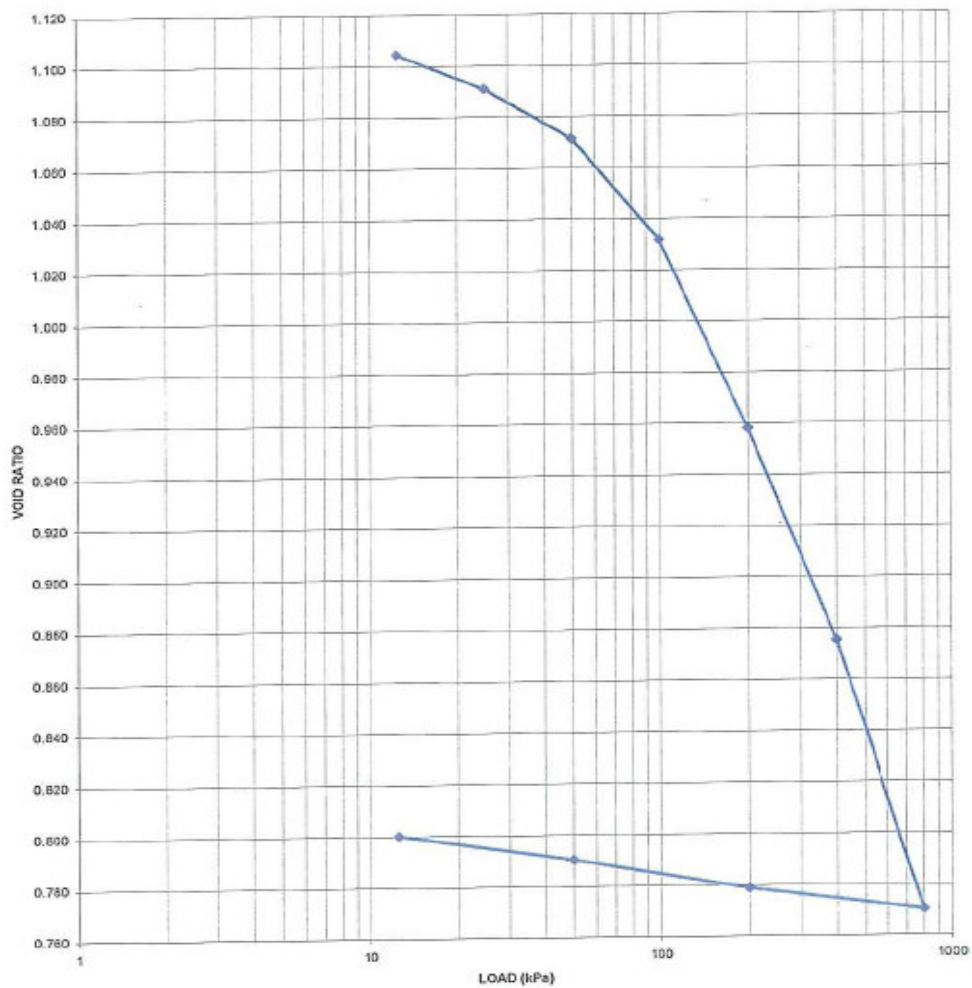


KONS/KONSOLIDASIE-GEWOON0954-09

CONSOLIDATION TEST

| | | | |
|--------------------------------|----------------|---|-------|
| PROJECT: | STEELPOORT PSS | INITIAL DRY DENSITY (kg/m ³): | 1375 |
| SAMPLE NO: | PL 10 | INITIAL MOISTURE CONTENT (%): | 12.0 |
| DEPTH (m): | 4.1 | MOISTURE CONTENT AFTER TEST (%): | 24.9 |
| INITIAL HEIGHT OF SAMPLE (mm): | 19.5 | RELATIVE DENSITY: | 2.914 |
| SAMPLE STATE: | UNDISTURBED | INITIAL VOID RATIO: | 1.120 |
| SOILLAB SAMPLE No.: | S06-0954-10 | VOID RATIO AFTER SOAKING: | 1.119 |
| | | SATURATION (%): | 94.3 |

| | | | | | | | | | | | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| LOAD (kPa): | 0 | W | 12.5 | 25 | 50 | 100 | 200 | 400 | 800 | 200 | 50 | 12.5 |
| HEIGHT (mm) | 13.500 | 19.496 | 19.360 | 19.236 | 19.056 | 18.690 | 18.012 | 17.250 | 16.282 | 16.362 | 16.468 | 16.558 |
| VOID RATIO: | 1.120 | 1.119 | 1.104 | 1.091 | 1.071 | 1.032 | 0.958 | 0.875 | 0.770 | 0.776 | 0.799 | 0.800 |



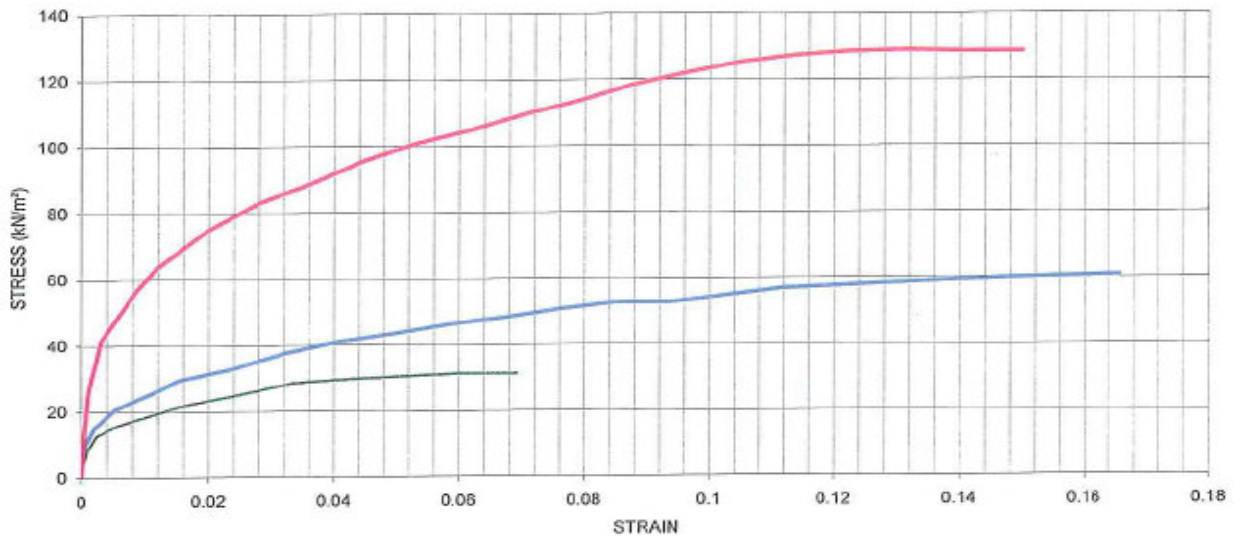
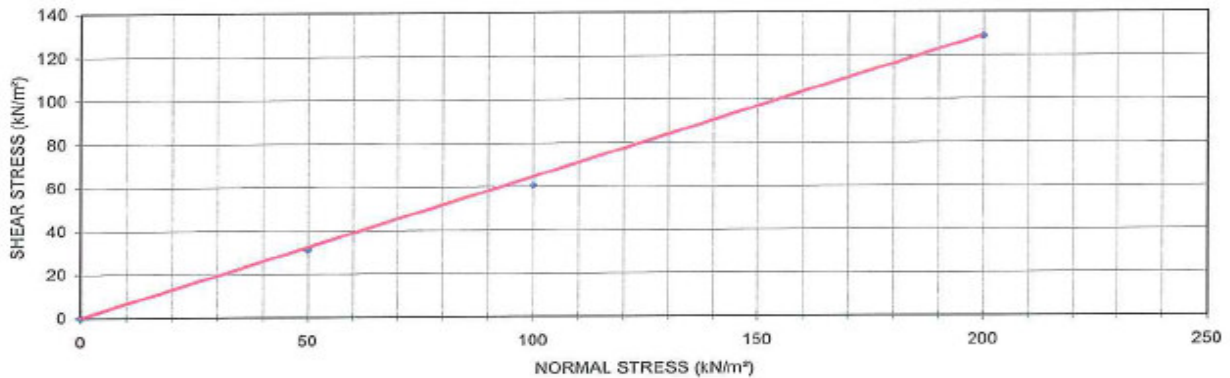
KONS/KONSOLIDASIE-GEWOON/0954-10

DRAINED DIRECT SHEAR TEST

PROJECT

STEELPOORT PSS

| SAMPLE NO. | SAMPLE DEPTH (m) | NORMAL STRESS (kN/m ²) | PEAK SHEAR | | PEAK ANGLE OF INTERNAL FRICTION (DEG) | COHESION (kN/m ²) | INITIAL MOISTURE (%) | MOISTURE AFTER TEST (%) | INITIAL DRY DENSITY (kg/m ³) |
|-------------|------------------|------------------------------------|-----------------------------|-------------------|---------------------------------------|-------------------------------|----------------------|-------------------------|--|
| | | | STRESS (kN/m ²) | DISPLACEMENT (mm) | | | | | |
| FL 5 TPL 11 | 0.5 | 50 | 31.1 | 3.01 | 33.2 | 0.0 | 3.6 | 19.3 | 2007 |
| | | 100 | 60.5 | 6.30 | | | | | |
| | | 200 | 128.7 | 6.60 | | | | | |



NOTE(1): THE ABOVE UNDISTURBED SOIL SAMPLE WERE TESTED IN A SATURATED CONDITION UNDER SELECTED NORMAL LOADS IN A 50.0 mm DIAMETER BOX USING A CONTROLLED RATE OF DISPLACEMENT OF 0.0906 mm PER MINUTE.

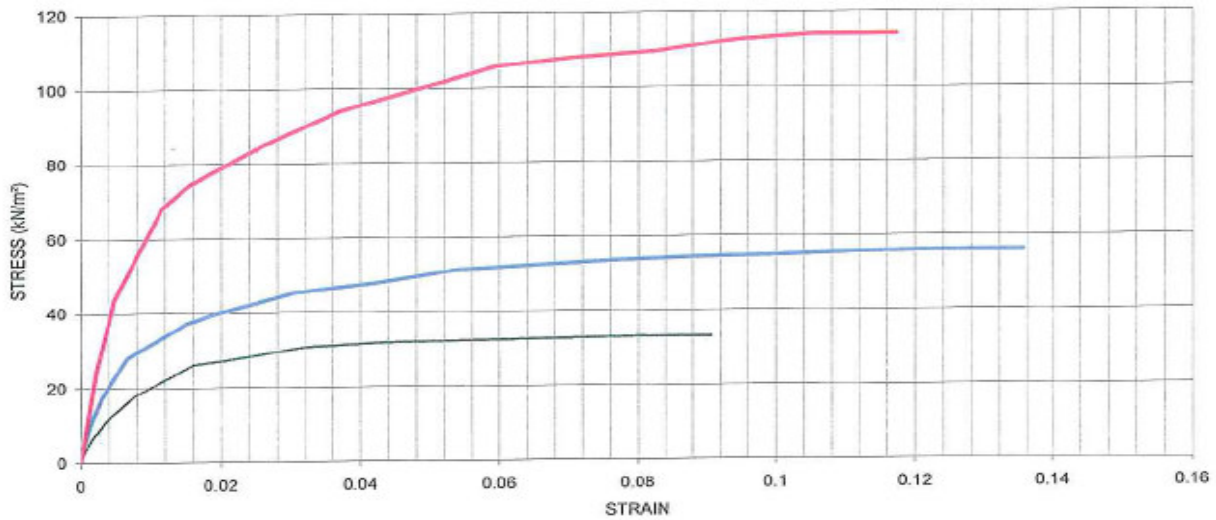
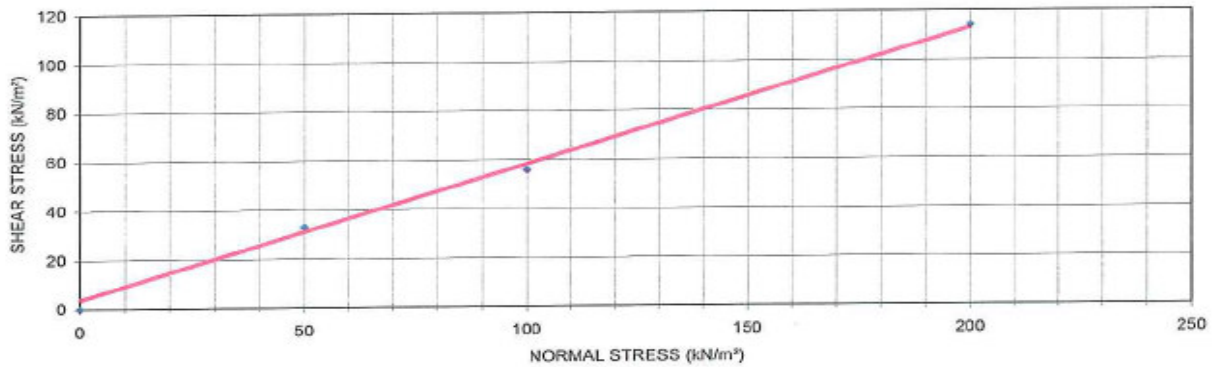
NOTE(2): SOILLAB SAMPLE No.: S06-0954-05

BOXSHR/0954-05

DRAINED DIRECT SHEAR TEST

PROJECT STEELPOORT

| SAMPLE NO. | SAMPLE DEPTH (m) | NORMAL STRESS (kN/m ²) | PEAK SHEAR | | PEAK ANGLE OF INTERNAL FRICTION (DEG) | COHESION (kN/m ²) | INITIAL MOISTURE (%) | MOISTURE AFTER TEST (%) | INITIAL DRY DENSITY (kg/m ³) |
|------------|------------------|------------------------------------|-----------------------------|-------------------|---------------------------------------|-------------------------------|----------------------|-------------------------|--|
| | | | STRESS (kN/m ²) | DISPLACEMENT (mm) | | | | | |
| PL 6 | 0.55 | 50 | 32.9 | 3.95 | 28.7 | 3.7 | 16.4 | 25.2 | 1777 |
| | | 100 | 55.7 | 6.20 | | | | | |
| | | 200 | 114.1 | 5.29 | | | | | |



NOTE(1): THE ABOVE UNDISTURBED SOIL SAMPLE WERE TESTED IN A SATURATED CONDITION UNDER SELECTED NORMAL LOADS IN A 50.0 mm DIAMETER BOX USING A CONTROLLED RATE OF DISPLACEMENT OF 0.1178 mm PER MINUTE.

NOTE(2): SOILLAB SAMPLE No.: S06-0954-06

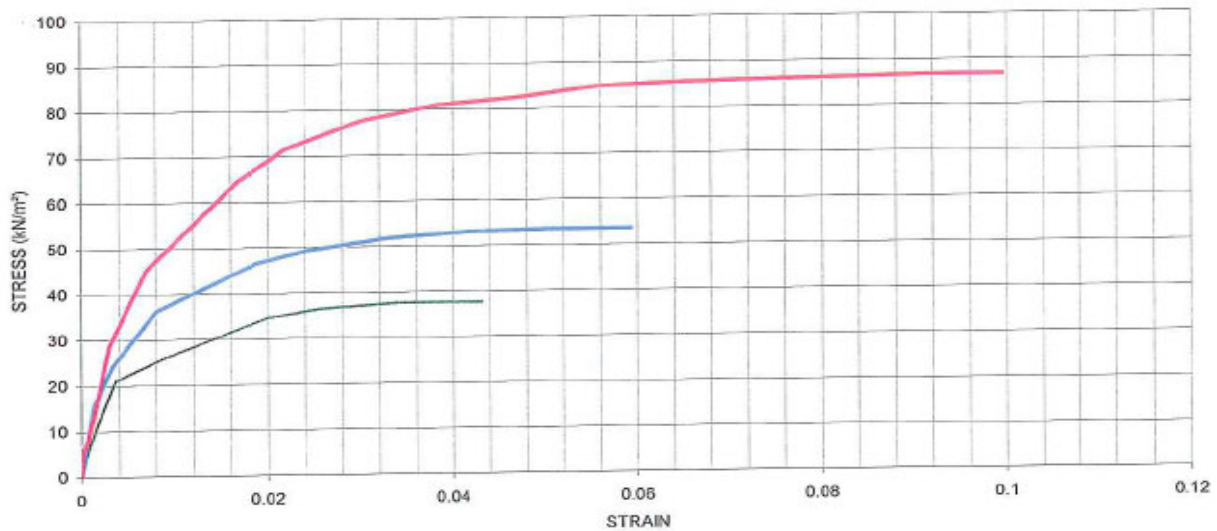
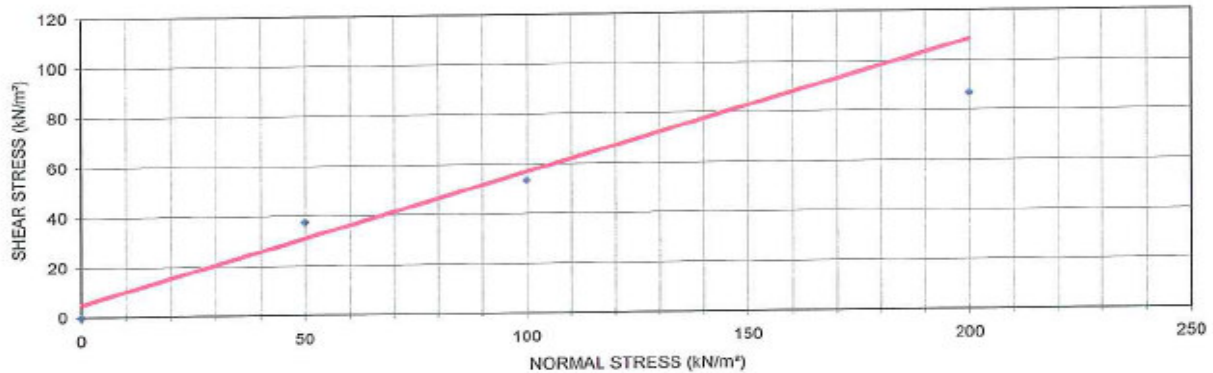
BOXSHR/0954-06

DRAINED DIRECT SHEAR TEST

PROJECT

STEELPOORT PSS

| SAMPLE NO. | SAMPLE DEPTH (m) | NORMAL STRESS (kN/m ²) | PEAK SHEAR | | PEAK ANGLE OF INTERNAL FRICTION (DEG) | COHESION (kN/m ²) | INITIAL MOISTURE (%) | MOISTURE AFTER TEST (%) | INITIAL DRY DENSITY (kg/m ³) |
|------------|------------------|------------------------------------|-----------------------------|-------------------|---------------------------------------|-------------------------------|----------------------|-------------------------|--|
| | | | STRESS (kN/m ²) | DISPLACEMENT (mm) | | | | | |
| PL 8 | 2.75 | 50 | 37.5 | 1.72 | 27.4 | 5.1 | 28.7 | 37.8 | 1366 |
| | | 100 | 53.3 | 2.53 | | | | | |
| | | 200 | 86.6 | 4.55 | | | | | |



NOTE(1): THE ABOVE UNDISTURBED SOIL SAMPLE WERE TESTED IN A SATURATED CONDITION UNDER SELECTED NORMAL LOADS IN A 50.0 mm DIAMETER BOX USING A CONTROLLED RATE OF DISPLACEMENT OF 0.1473 mm PER MINUTE.

NOTE(2): SOILLAB SAMPLE No.: S06-0954-08

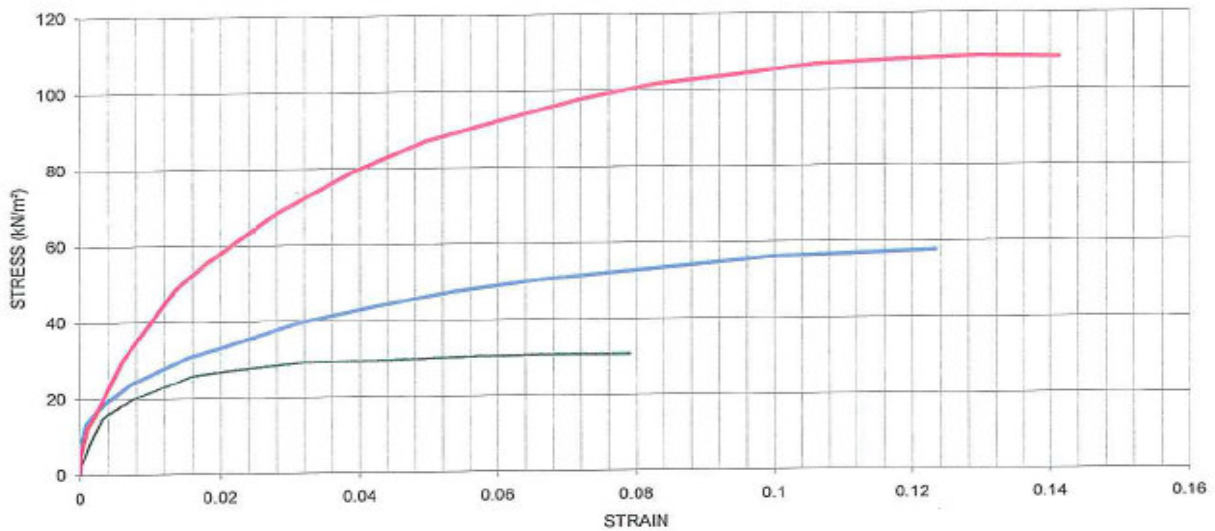
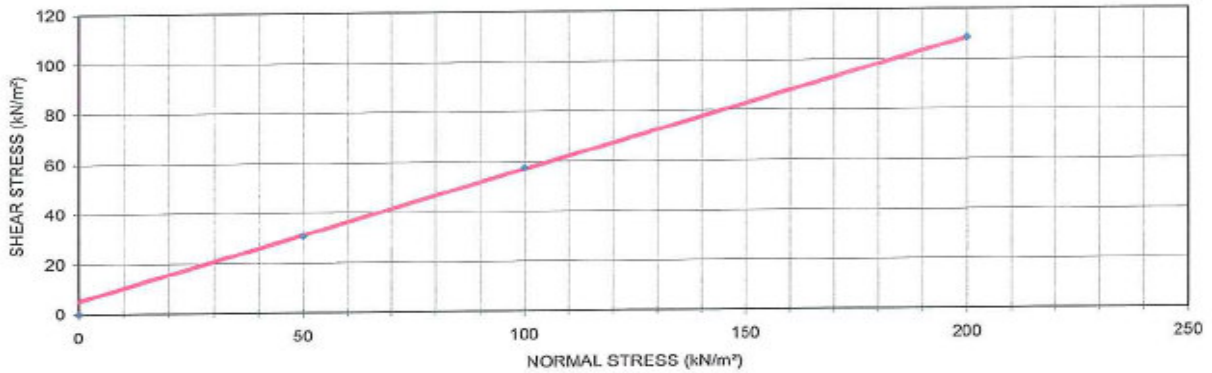
BOXSHR/0954-08

DRAINED DIRECT SHEAR TEST

PROJECT

STEELPOORT PSS

| SAMPLE NO. | SAMPLE DEPTH (m) | NORMAL STRESS (kN/m ²) | PEAK SHEAR | | PEAK ANGLE OF INTERNAL FRICTION (DEG) | COHESION (kN/m ²) | INITIAL MOISTURE (%) | MOISTURE AFTER TEST (%) | INITIAL DRY DENSITY (kg/m ³) |
|------------|------------------|------------------------------------|-----------------------------|-------------------|---------------------------------------|-------------------------------|----------------------|-------------------------|--|
| | | | STRESS (kN/m ²) | DISPLACEMENT (mm) | | | | | |
| PL 9 TPL 4 | 0.55 | 50 | 30.6 | 3.37 | 27.4 | 5.1 | 12.8 | 23.9 | 1528 |
| | | 100 | 57.3 | 6.18 | | | | | |
| | | 200 | 108.4 | 6.49 | | | | | |



NOTE(1): THE ABOVE UNDISTURBED SOIL SAMPLE WERE TESTED IN A SATURATED CONDITION UNDER SELECTED NORMAL LOADS IN A 61.8 mm DIAMETER BOX USING A CONTROLLED RATE OF DISPLACEMENT OF 0.1178 mm PER MINUTE.

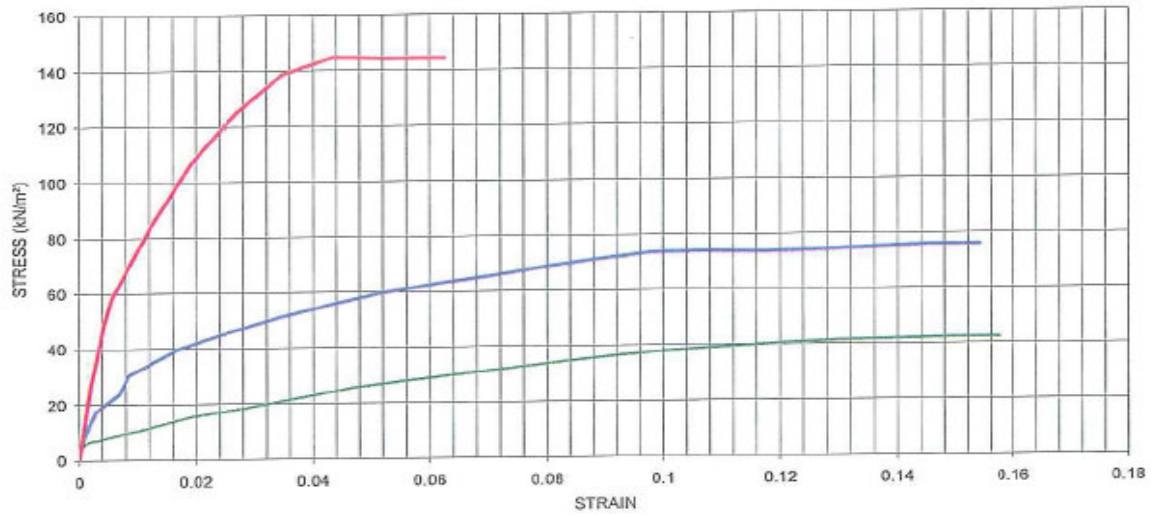
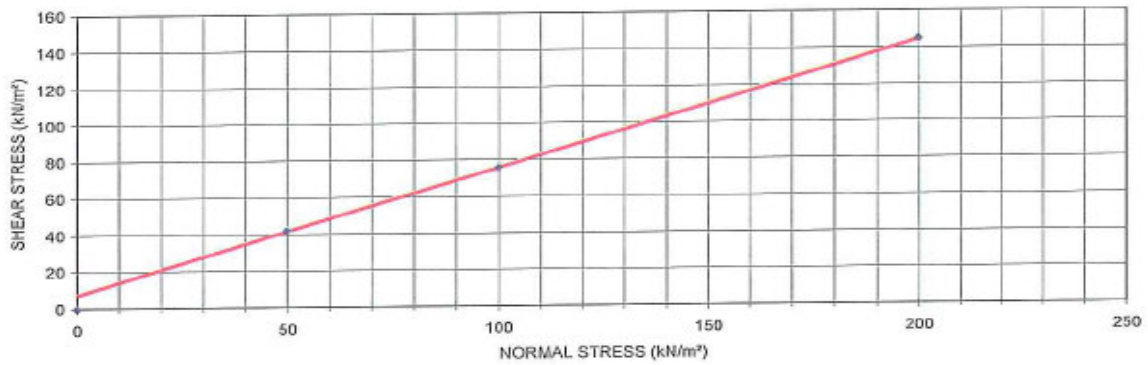
NOTE(2): SOILLAB SAMPLE No.: S06-0954-09

BOXSHR/0954-09

DRAINED DIRECT SHEAR TEST

PROJECT STEELPOORT

| SAMPLE NO. | SAMPLE DEPTH (m) | NORMAL STRESS (kN/m ²) | PEAK SHEAR | | PEAK ANGLE OF INTERNAL FRICTION (DEG) | COHESION (kN/m ²) | INITIAL MOISTURE (%) | MOISTURE AFTER TEST (%) | INITIAL DRY DENSITY (kg/m ³) |
|------------|------------------|------------------------------------|-----------------------------|-------------------|---------------------------------------|-------------------------------|----------------------|-------------------------|--|
| | | | STRESS (kN/m ²) | DISPLACEMENT (mm) | | | | | |
| PL 10 | 4.1 | 50 | 42.1 | 7.44 | 34.5 | 7.4 | 10.0 | 28.2 | 1413 |
| | | 100 | 75.6 | 7.26 | | | | | |
| | | 200 | 144.9 | 2.18 | | | | | |



NOTE(1): THE ABOVE UNDISTURBED SOIL SAMPLE WERE TESTED IN A SATURATED CONDITION UNDER SELECTED NORMAL LOADS IN A 50.0 mm DIAMETER BOX USING A CONTROLLED RATE OF DISPLACEMENT OF 0.0589 mm PER MINUTE.

NOTE(2): SOILLAB SAMPLE No.: S06-0954-10

CLIENT : BKS
PROJECT : STEELPOORT PSS
PROJECT NO. : S06-0954
DATE : 2006-10-11

PERMEABILITY ON UNDISTURBED SAMPLES

| Soillab No | Sample No | Depth (m) | Initial Dry Density (kg/m ³) | Initial Moisture Content (%) | Head of Water (cm) | Coëfficiënt of Permeability (cm/s) |
|-------------|-----------|-----------|--|------------------------------|--------------------|------------------------------------|
| S06-0954-05 | PL5 | 0.5 | 2215 | 2.9 | 510.0 | 1.184 x 10 ⁻⁶ |
| S06-0954-06 | PL6 | 0.55 | 1734 | 16.4 | Falling Head | 6.652 x 10 ⁻⁹ |
| S06-0954-08 | PL8 | 2.75 | 1435 | 30.8 | Falling Head | 7.089 x 10 ⁻⁹ |
| S06-0954-09 | PL9 | 0.55 | 1541 | 12.8 | 102.0 | 4.320 x 10 ⁻⁴ |
| S06-0954-10 | PL10 | 4.1 | 1457 | 10.3 | 102.0 | 2.252 x 10 ⁻⁴ |
| | | | | | | |

0954-01

CLIENT : BKS
 PROJECT : PROJECT LIMA PHASE 2
 PROJECT NO. : S06-1035
 DATE : 2006-11-15

PERMEABILITY TESTS

| Soillab No | Sample No | Depth (m) | Test Pit No | Max. Proctor Dry Density (kg/m ³) | Optimum Moisture Content (%) | Compaction As Percent Of Max. Proctor Dry Density (%) | Bentonite (%) | Coëfficiënt of Permeability (cm/s) |
|-------------|-----------|-----------|-------------|---|------------------------------|---|---------------|------------------------------------|
| S06-1035-01 | PL11 | 0.5 | TPL1 | 1610 | 15.8 | | | |
| S06-1035-03 | PL13 | 1.6 | TPL4 | 1649 | 17.7 | 98.0 | - | 2.026 X 10 ⁻⁸ |
| | | | | | | 98.0 | 5.0 | 1.859 X 10 ⁻⁸ |
| | | | | | | 98.0 | 8.0 | 1.261 X 10 ⁻⁸ |
| S06-1035-05 | PL15 | 0.3-1.4 | TPL11 | 1463 | 24.7 | | | |
| S06-1035-08 | PL18 | 1.0-1.5 | TPL11 | 1816 | 15.4 | 98.0 | - | 1.747 X 10 ⁻⁷ |
| | | | | | | | | |

Note : Tests performed with a Falling Head Permeameter.

1035-01

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SOIL ANALYSIS BY : SOILLAB (Pty) Ltd
 Lab reference No. : S06-1035A

Page : 1
 Date Printed : 2007-01-19

| | | | | | | | | |
|--|---------------------------------------|------------------------------|------------------------------|--------------------------------------|--------------------------------------|------------------------------|--------------|--|
| Customer | BKS | | | | | Job Number | S06-1035A | |
| Job Description | PROJECT LIMA (STEELPOORT PSS) PHASE 2 | | | | | Contract Number | | |
| Road Number | | | | | | Date | 2006-11-08 | |
| SAMPLE DESCRIPTION | 24193 | 24194 | 24195 | 24196 | 24200 | 24201 | | |
| Sample Number | PL22 | PL23 | PL27 | PL28 | PL32 | PL24, PL25, PL26 | | |
| Sample Position | | | | | | | | |
| Sample Depth (mm) | 1200 | 3500 | 500-3000 | 500-4000 | 200-2700 | DARK R/O SHALE | | |
| Material Description | PALE RED CHERT SANDY SILT | DARK Y/O SHALE SANDY SILT | DARK Y/O SHALE SANDY CLAY | DARK Y/O FERRICRETE SANDY CLAY | DARK R/O FERRICRETE SANDY SILT | DARK R/O SHALE SANDY CLAY | | |
| Max size of boulder (mm) | - | - | - | - | - | - | | |
| SCREEN ANALYSIS (% PASS) | | | | | | | | |
| 75,00 mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| 63,00 mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| 53,00 mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| 37,50 mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| 26,50 mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| 19,00 mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| 13,20 mm | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| 4,750 mm | 100 | 99 | 99 | 99 | 99 | 98 | 100 | |
| 2,000 mm | 99 | 93 | 94 | 95 | 93 | 93 | 95 | |
| 0,425 mm | 87 | 75 | 83 | 82 | 80 | 80 | 78 | |
| 0,075 mm | 41 | 40 | 46 | 48 | 45 | 45 | 45 | |
| SOIL MORTAR | | | | | | | | |
| Coarse Sand 2,000-0,425 | 12 | 18 | 12 | 14 | 13 | 18 | 18 | |
| Coarse Fine Sd 0,425-0,250 | 17 | 11 | 9 | 11 | 8 | 10 | 10 | |
| Medium Fine Sd 0,250-0,150 | 16 | 14 | 16 | 13 | 15 | 15 | 15 | |
| Fine Fine Sand 0,150-0,075 | 14 | 13 | 13 | 12 | 15 | 11 | 11 | |
| Material <0,075 | 41 | 44 | 50 | 50 | 49 | 46 | 46 | |
| CONSTANTS | | | | | | | | |
| Grading Modulus | 0.73 | 0.92 | 0.77 | 0.75 | 0.82 | 0.82 | 0.82 | |
| Liquid Limit | 32 | 32 | 35 | 32 | 33 | 36 | 36 | |
| Plasticity Index | 8 | 6 | 12 | 11 | 10 | 14 | 14 | |
| Linear Shrinkage (%) | 4.0 | 3.0 | 6.0 | 5.0 | 5.0 | 6.5 | 6.5 | |
| Sand Equivalent | | | | | | | | |
| Classification - TRB | A-4 (1) | A-4 (1) | A-6 (3) | A-6 (3) | A-4 (2) | A-6 (3) | A-6 (3) | |
| Classification - COLTO | >G9 | G7 | G7 | G7 | G7 | >G9 | >G9 | |
| CBR / UCS VALUES | CBR | CBR | CBR | CBR | CBR | CBR | CBR | |
| MOD. AASHTO | | | | | | | | |
| Max Dry Density (kg/m ³) | 1684 | 1806 | 1723 | 1853 | 1822 | 1783 | 1783 | |
| Optimum Moisture Cont (%) | 13.0 | 11.4 | 15.9 | 11.4 | 12.1 | 13.6 | 13.6 | |
| Moulding Moisture Cont (%) | 15.7 | 13.2 | 18.3 | 11.7 | 13.6 | 14.6 | 14.6 | |
| Dry Density (kg/m ³) | 1790 | 1783 | 1737 | 1825 | 1809 | 1786 | 1786 | |
| % of Max Dry Density | 106.3 | 98.7 | 100.8 | 98.5 | 99.3 | 100.2 | 100.2 | |
| 100% Mod CBR/UCS | 99 | 110 | 93 | 57 | 73 | 74 | 74 | |
| % Swell | 0.0 | 0.1 | 0.2 | 0.2 | 0.0 | 0.1 | 0.1 | |
| NRB | | | | | | | | |
| Dry Density (kg/m ³) | 1682 | 1679 | 1654 | 1747 | 1700 | 1712 | 1712 | |
| % of Max Dry Density | 99.9 | 93.0 | 96.0 | 94.3 | 93.3 | 96.0 | 96.0 | |
| 100% NRB CBR/UCS | 66 | 58 | 63 | 39 | 54 | 48 | 48 | |
| % Swell | 0.1 | 0.2 | 0.1 | 0.5 | 0.2 | 0.9 | 0.9 | |
| PROCTOR | | | | | | | | |
| Dry Density (kg/m ³) | 1603 | 1601 | 1577 | 1654 | 1618 | 1600 | 1600 | |
| % of Max Dry Density | 95.2 | 88.6 | 91.5 | 89.3 | 88.8 | 89.7 | 89.7 | |
| 100% Proc CBR/UCS | 41 | 30 | 39 | 14 | 27 | 20 | 20 | |
| % Swell | 0.1 | 0.1 | 0.1 | 0.6 | 0.2 | 0.2 | 0.2 | |
| CBR / UCS VALUES | | | | | | | | |
| 100% Mod AASHTO | 66 | 127 | 87 | 65 | 76 | 73 | 73 | |
| 98% Mod AASHTO | 55 | 101 | 74 | 55 | 68 | 59 | 59 | |
| 97% Mod AASHTO | 49 | 91 | 68 | 50 | 66 | 53 | 53 | |
| 95% Mod AASHTO | 40 | 73 | 57 | 42 | 59 | 42 | 42 | |
| 93% Mod AASHTO | 33 | 58 | 46 | 30 | 52 | 32 | 32 | |
| 90% Mod AASHTO | 24 | 37 | 33 | 16 | 32 | 21 | 21 | |
| Soillab No | S06-1035A-01 | S06-1035A-02 | S06-1035A-03 | S06-1035A-04 | S06-1035A-08 | S06-1035A-09 | S06-1035A-09 | |
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