GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF SAND | ASTM C 128 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 20.6.1987

Sample: TMK-1  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| NO. of Flask | ① | | 1 | 4 | |
| Weight of Flask (g) | ② | | 201.15 | 156.05 | |
| Weight of Specimen (g) | ③ | | 500 | 500 | |
| Weight of (Flask+Water +Specimen) (g) | ④ | | 1001.05 | 956.96 | |
| Weight of Poured Water into a Flask (g) | ⑤ | ④-(②+ ③) | 299.90 | 300.91 | |
| Specific Gravity | ⑥ | $\frac{③}{500-⑤}$ | 2.499 | 2.511 | |
| Mean Value | ⑦ | | 2.505 | | |
| Weight of Dried Specimen (g) | ⑧ | | 493.83 | 494.4 | |
| Absorption (%) | ⑨ | $\frac{③-⑧}{⑧}\times 100$ | 1.23 | 1.12 | |
| Mean Value (%) | ⑩ | | 1.19 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF SAND | ASTM C 128 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 20.6.1987

Sample: TMK-2  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| NO. of Flask | ① | | 5 | 8 | |
| Weight of Flask (g) | ② | | 156.48 | 199.75 | |
| Weight of Specimen (g) | ③ | | 500 | 500 | |
| Weight of (Flask+Water +Specimen) (g) | ④ | | 958.40 | 1001.12 | |
| Weight of Poured Water into a Flask (g) | ⑤ | ④-(②+ ③) | 301.92 | 301.37 | |
| Specific Gravity | ⑥ | $\frac{③}{500-⑤}$ | 2.524 | 2.517 | |
| Mean Value | ⑦ | | 2.521 | | |
| Weight of Dried Specimen (g) | ⑧ | | 494.30 | 494.95 | |
| Absorption (%) | ⑨ | $\frac{③-⑧}{⑧}\times 100$ | 1.14 | 1.01 | |
| Mean Value (%) | ⑩ | | 1.09 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF SAND | ASTM C 128 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 20.6.1987

Sample: TMK-3  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| NO. of Flask | ① | | 9 | 12 | |
| Weight of Flask (g) | ② | | 199.70 | 201.87 | |
| Weight of Specimen (g) | ③ | | 500 | 500 | |
| Weight of (Flask+Water +Specimen) (g) | ④ | | 998.92 | 1002.44 | |
| Weight of Poured Water into a Flask (g) | ⑤ | ④-(②+ ③) | 299.22 | 300.57 | |
| Specific Gravity | ⑥ | $\frac{③}{500-⑤}$ | 2.490 | 2.507 | |
| Mean Value | ⑦ | | 2.499 | | |
| Weight of Dried Specimen (g) | ⑧ | | 489.95 | 490.06 | |
| Absorption (%) | ⑨ | $\frac{③-⑧}{⑧}\times 100$ | 2.01 | 1.99 | |
| Mean Value (%) | ⑩ | | 2.04 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF SAND | ASTM C 128 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 20.6.1987

Sample: TMK-4  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| NO. of Flask | ① | | AE | F | |
| Weight of Flask (g) | ② | | 156.32 | 166.41 | |
| Weight of Specimen (g) | ③ | | 500 | 500 | |
| Weight of (Flask+Water +Specimen) (g) | ④ | | 962.31 | 971.28 | |
| Weight of Poured Water into a Flask (g) | ⑤ | ④-(②+ ③) | 305.99 | 304.87 | |
| Specific Gravity | ⑥ | $\frac{③}{500-⑤}$ | 2.577 | 2.562 | |
| Mean Value | ⑦ | | 2.570 | | |
| Weight of Dried Specimen (g) | ⑧ | | 495.02 | 495.10 | |
| Absorption (%) | ⑨ | $\frac{③-⑧}{⑧}\times 100$ | 1.01 | 0.99 | |
| Mean Value (%) | ⑩ | | 1.00 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF SAND | ASTM C 128 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 20.6.1987

Sample: TMK-5  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| NO. of Flask | ① | | AJ | AI | |
| Weight of Flask (g) | ② | | 201.09 | 200.71 | |
| Weight of Specimen (g) | ③ | | 500 | 500 | |
| Weight of (Flask+Water +Specimen) (g) | ④ | | 1000.61 | 998.90 | |
| Weight of Poured Water into a Flask (g) | ⑤ | ④-(②+③) | 299.52 | 298.19 | |
| Specific Gravity | ⑥ | $\frac{③}{500-⑤}$ | 2.494 | 2.478 | |
| Mean Value | ⑦ | | 2.486 | | |
| Weight of Dried Specimen (g) | ⑧ | | 493.0 | 492.80 | |
| Absorption (%) | ⑨ | $\frac{③-⑧}{⑧}\times 100$ | 1.42 | 1.46 | |
| Mean Value (%) | ⑩ | | 1.44 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF SAND | ASTM C 128 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 4-7-1987

Sample: TMK-6  Tested by: F.K.H.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| NO. of Flask | ① | | 21 | 22 | |
| Weight of Flask (g) | ② | | 166.50 | 156.56 | |
| Weight of Specimen (g) | ③ | | 500 | 500 | |
| Weight of (Flask+Water +Specimen) (g) | ④ | | 973.8 | 964.9 | |
| Weight of Poured Water into a Flask (g) | ⑤ | ④-(②+ ③) | 307.3 | 308.34 | |
| Specific Gravity | ⑥ | $\frac{③}{500-⑤}$ | 2.595 | 2.609 | |
| Mean Value | ⑦ | | 2.602 | | |
| Weight of Dried Specimen (g) | ⑧ | | 480.3 | 481.1 | |
| Absorption (%) | ⑨ | $\frac{③-⑧}{⑧}\times 100$ | 4.10 | 3.93 | |
| Mean Value (%) | ⑩ | | 4.02 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 22.6.1987

Sample: TMK-1  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 5174 | 5276 | |
| Weight of (Specimen + Basket) in Water | ② | | 3347 | 3432 | |
| Weight of Basket in Water | ③ | | 261 | 261 | |
| Weight of Specimen in Water | ④ | ②−③ | 3086 | 3171 | |
| Dry Weight of Specimen | ⑤ | | 5065 | 5181 | |
| Bulk Specific Gravity | ⑥ | $\frac{⑤}{①-④}$ | 2.426 | 2.461 | |
| Mean Value | ⑦ | | 2.444 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 109 | 95 | |
| Absorption % | ⑨ | $\frac{⑧}{⑤} \times 100$ | 2.15 | 1.83 | |
| Mean Value % | | | 1.99 | | |
| SSD Specific Gravity | | $\frac{①}{①-④}$ | 2.478 | 2.506 | |
| Mean Value | | | 2.492 | | |
| Apparent Specific Gravity | | $\frac{⑤}{⑤-④}$ | 2.559 | 2.578 | |
| Mean Value | | | 2.568 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project Small Hydro Study For Mukoh Date 22.6.1987

Sample TMK-2 Tested by K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 5308 | 5154 | |
| Weight of (Specimen + Basket) in Water | ② | | 3455 | 3401 | |
| Weight of Basket in Water | ③ | | 261 | 261 | |
| Weight of Specimen in Water | ④ | ②−③ | 3194 | 3140 | |
| Dry Weight of Specimen | ⑤ | | 5225 | 5059 | |
| Bulk Specific Gravity | ⑥ | $\frac{⑤}{①-④}$ | 2.472 | 2.512 | |
| Mean Value | ⑦ | | 2.492 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 83 | 95 | |
| Absorption % | ⑨ | $\frac{⑧}{⑤}\times 100$ | 1.59 | 1.88 | |
| Mean Value % | | | 1.74 | | |
| SSD Specific Gravity | | $\frac{①}{①-④}$ | 2.511 | 2.559 | |
| Mean Value | | | 2.535 | | |
| Apparent Specific Gravity | | $\frac{⑤}{⑤-④}$ | 2.573 | 2.636 | |
| Mean Value | | | 2.605 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 22.6.1987

Sample: TMK-3  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 5748 | 6351 | |
| Weight of (Specimen + Basket) in Water | ② | | 3735 | 4109 | |
| Weight of Basket in Water | ③ | | 261 | 261 | |
| Weight of Specimen in Water | ④ | ②−③ | 3474 | 3848 | |
| Dry Weight of Specimen | ⑤ | | 5693 | 6284 | |
| Bulk Specific Gravity | ⑥ | ⑤/(①−④) | 2.504 | 2.511 | |
| Mean Value | ⑦ | | 2.508 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 55 | 67 | |
| Absorption % | ⑨ | ⑧/⑤ ×100 | 0.97 | 1.07 | |
| Mean Value % | | | 1.02 | | |
| SSD Specific Gravity | | ①/(①−④) | 2.528 | 2.537 | |
| Mean Value | | | 2.533 | | |
| Apparent Specific Gravity | | ⑤/(⑤−④) | 2.566 | 2.579 | |
| Mean Value | | | 2.573 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 22.6.1987

Sample: TMK-4  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 5678 | 5792 | |
| Weight of (Specimen + Basket) in Water | ② | | 3697 | 3769 | |
| Weight of Basket in Water | ③ | | 261 | 261 | |
| Weight of Specimen in Water | ④ | ②−③ | 3436 | 3508 | |
| Dry Weight of Specimen | ⑤ | | 5625 | 5732 | |
| Bulk Specific Gravity | ⑥ | $\frac{⑤}{①-④}$ | 2.509 | 2.510 | |
| Mean Value | ⑦ | | 2.510 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 53 | 60 | |
| Absorption % | ⑨ | $\frac{⑧}{⑤}\times 100$ | 0.94 | 1.05 | |
| Mean Value % | | | 0.99 | | |
| SSD Specific Gravity | | $\frac{①}{①-④}$ | 2.533 | 2.536 | |
| Mean Value | | | 2.535 | | |
| Apparent Specific Gravity | | $\frac{⑤}{⑤-④}$ | 2.570 | 2.577 | |
| Mean Value | | | 2.574 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 22.6.1987

Sample: TMK-5  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 6348 | 6186 | |
| Weight of (Specimen + Basket) in Water | ② | | 4133 | 4008 | |
| Weight of Basket in Water | ③ | | 261 | 261 | |
| Weight of Specimen in Water | ④ | ②−③ | 3872 | 3747 | |
| Dry Weight of Specimen | ⑤ | | 6289 | 6126 | |
| Bulk Specific Gravity | ⑥ | $\frac{⑤}{①-④}$ | 2.540 | 2.512 | |
| Mean Value | ⑦ | | 2.526 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 59 | 60 | |
| Absorption % | ⑨ | $\frac{⑧}{⑤}\times 100$ | 0.94 | 0.98 | |
| Mean Value % | | | 0.96 | | |
| SSD Specific Gravity | | $\frac{①}{①-④}$ | 2.564 | 2.536 | |
| Mean Value | | | 2.550 | | |
| Apparent Specific Gravity | | $\frac{⑤}{⑤-④}$ | 2.602 | 2.575 | |
| Mean Value | | | 2.589 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 4.7.1987

Sample: TMK-6  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 5205 | 4205 | |
| Weight of (Specimen + Basket) in Water | ② | | 3356 | 2738 | |
| Weight of Basket in Water | ③ | | 235 | 235 | |
| Weight of Specimen in Water | ④ | ②−③ | 3121 | 2503 | |
| Dry Weight of Specimen | ⑤ | | 5037 | 4054 | |
| Bulk Specific Gravity | ⑥ | $\frac{⑤}{①-④}$ | 2.417 | 2.382 | |
| Mean Value | ⑦ | | 2.400 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 168 | 151 | |
| Absorption % | ⑨ | $\frac{⑧}{⑤}\times 100$ | 3.34 | 3.72 | |
| Mean Value % | | | 3.53 | | |
| SSD Specific Gravity | | $\frac{①}{①-④}$ | 2.498 | 2.471 | |
| Mean Value | | | 2.484 | | |
| Apparent Specific Gravity | | $\frac{⑤}{⑤-④}$ | 2.629 | 2.614 | |
| Mean Value | | | 2.621 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 15.7.1987

Sample: TMK-7/Crushed Rock  Tested by: K.H.F.

| Specimen NO. | | | 1 | 2 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 3216 | 2991 | |
| Weight of (Specimen + Basket) in Water | ② | | 2192 | 2058 | |
| Weight of Basket in Water | ③ | | 268 | 268 | |
| Weight of Specimen in Water | ④ | ②−③ | 1924 | 1790 | |
| Dry Weight of Specimen | ⑤ | | 3131 | 2917 | |
| Bulk Specific Gravity | ⑥ | $\frac{⑤}{①-④}$ | 2.423 | 2.429 | |
| Mean Value | ⑦ | | 2.426 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 85 | 74 | |
| Absorption % | ⑨ | $\frac{⑧}{⑤} \times 100$ | 2.72 | 2.54 | |
| Mean Value % | | | 2.63 | | |
| SSD Specific Gravity | | $\frac{①}{①-④}$ | 2.489 | 2.490 | |
| Mean Value | | | 2.490 | | |
| Apparent Specific Gravity | | $\frac{⑤}{⑤-④}$ | 2.594 | 2.588 | |
| Mean Value | | | 2.591 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SPECIFIC GRAVITY AND ABSORPTION OF GRAVEL | ASTM C 127 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 25.8.1987

Sample: TMK-7/Crushed Rock  Tested by: K.H.F.

| Specimen NO. | | | 3 | 4 | |
|---|---|---|---|---|---|
| Saturated-Surface-Dry Weight of Specimen | ① | | 2108 | 2060 | |
| Weight of (Specimen + Basket) in Water | ② | | 1708 | 1683 | |
| Weight of Basket in Water | ③ | | 445 | 445 | |
| Weight of Specimen in Water | ④ | ②−③ | 1263 | 1238 | |
| Dry Weight of Specimen | ⑤ | | 2062 | 2011 | |
| Bulk Specific Gravity | ⑥ | $\frac{⑤}{①-④}$ | 2.440 | 2.446 | |
| Mean Value | ⑦ | | 2.443 | | |
| Weight of Pore Water | ⑧ | ①−⑤ | 46 | 49 | |
| Absorption % | ⑨ | $\frac{⑧}{⑤}\times 100$ | 2.23 | 2.44 | |
| Mean Value % | | | 2.34 | | |
| SSD Specific Gravity | | $\frac{①}{①-④}$ | 2.495 | 2.506 | |
| Mean Value | | | 2.501 | | |
| Apparent Specific Gravity | | $\frac{⑤}{⑤-④}$ | 2.581 | 2.602 | |
| Mean Value | | | 2.592 | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-1/Test 1  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-1/Test 2  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 17.6.1987

Sample: TMK-2/Test 1  Tested by: L.S.M.

Test Results :

Not Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-2/Test 2  Tested by: L.S.M.

Test Results :

Not Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-3/Test 1  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 17.6.1987

Sample: TMK-3/Test 2  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-4/Test 1  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-4/Test 2  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project Small Hydro Study For Mukoh Date 17.6.1987

Sample TMK-5/Test 1 Tested by L.S.M.

Test Results :

Not Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-5/Test 2  Tested by: L.S.M.

Test Results :

Not Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 4.7.1987

Sample: TMK-6/Test 1  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ORGANIC IMPURITIES OF SAND | ASTM C 40 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 4.7.1987

Sample: TMK-6/Test 2  Tested by: L.S.M.

Test Results :

Passed

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 26.6.1987

Sample: Tmk-1/Test 1  Tested by: B.C.L.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1180 | 1561 | 1537 | 2895 | 4980 | | 12153 |
| Weight Parcentage (%) | ② | 9.71 | 12.84 | 12.65 | 23.82 | 40.98 | | |
| Weight of Before Testing (g) | ③ | 1180 | 1561 | 1537 | 2895 | 4980 | | |
| Number of Particles | ④ | 511 | 230 | 68 | 25 | 20 | | |
| Weight of Soft Particles (g) | ⑤ | 108 | 131 | 165 | 57 | 281 | | |
| Number of Soft Particles | ⑥ | 58 | 25 | 10 | 1 | 1 | | |
| Weight Parcentage of Soft Particles (%) (⑤ /③) ×100 | ⑦ | 9.15 | 8.39 | 10.74 | 1.97 | 5.64 | | |
| Number Parcentage of Soft Particles (%) (⑥ /④) ×100 | ⑧ | 11.35 | 10.87 | 14.70 | 4.00 | 5.00 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 0.89 | 1.08 | 1.36 | 0.47 | 2.31 | | 6.1 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 16.6.1987

Sample: TMK-1/Test 2  Tested by: B.C.L.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1803 | 2026 | 2655 | 4398 | 5268 | | 16150 |
| Weight Parcentage (%) | ② | 11.16 | 12.54 | 16.44 | 27.23 | 32.62 | | |
| Weight of Before Testing (g) | ③ | 1803 | 2026 | 2655 | 4398 | 5268 | | |
| Number of Particles | ④ | 747 | 290 | 145 | 88 | 34 | | |
| Weight of Soft Particles (g) | ⑤ | 245 | 369 | 386 | 375 | 232 | | |
| Number of Soft Particles | ⑥ | 127 | 66 | 25 | 12 | 2 | | |
| Weight Parcentage of Soft Particles (⑤ /③) ×100 (%) | ⑦ | 13.59 | 18.21 | 14.54 | 8.53 | 4.40 | | |
| Number Parcentage of Soft Particles (⑥ /④) ×100 (%) | ⑧ | 17.00 | 22.76 | 17.24 | 13.64 | 5.88 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 1.52 | 2.28 | 2.39 | 2.32 | 1.44 | | 10.0 |

Remarks :

Average percentage of soft particles in Aggregate by weight is 8.1% (Average of two test)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 24.6.1987

Sample: TMK-2/Test 1  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1512 | 2265 | 2748 | 4768 | 9595 | | 20888 |
| Weight Parcentage (%) | ② | 7.24 | 10.84 | 13.16 | 22.83 | 45.94 | | |
| Weight of Before Testing (g) | ③ | - | 2265 | 2748 | 4768 | 9595 | | |
| Number of Particles | ④ | - | 336 | 152 | 109 | 60 | | |
| Weight of Soft Particles (g) | ⑤ | - | 406 | 453 | 625 | 606 | | |
| Number of Soft Particles | ⑥ | - | 74 | 35 | 16 | 8 | | |
| Weight Parcentage of Soft Particles (%) (⑤ /③) ×100 | ⑦ | 17.92 | 17.92 | 16.48 | 13.11 | 6.32 | | |
| Number Parcentage of Soft Particles (%) (⑥ /④) ×100 | ⑧ | - | 22.02 | 23.03 | 14.68 | 13.33 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 1.30 | 1.94 | 2.17 | 2.99 | 2.90 | | 11.3 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 24.6.1987

Sample: TMK-2/Test 2  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1041 | 1452 | 2813 | 4971 | 8637 | | 18914 |
| Weight Parcentage (%) | ② | 5.50 | 7.68 | 14.87 | 26.28 | 45.66 | | |
| Weight of Before Testing (g) | ③ | - | - | 2813 | 4971 | 8637 | | |
| Number of Particles | ④ | - | - | 127 | 88 | 51 | | |
| Weight of Soft Particles (g) | ⑤ | - | - | 488 | 502 | 375 | | |
| Number of Soft Particles | ⑥ | - | - | 31 | 12 | 4 | | |
| Weight Parcentage of Soft Particles (⑤/③) ×100 (%) | ⑦ | 17.35 | 17.35 | 17.35 | 10.10 | 4.34 | | |
| Number Parcentage of Soft Particles (⑥/④) ×100 (%) | ⑧ | - | - | 24.41 | 13.64 | 7.84 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 0.95 | 1.33 | 2.58 | 2.65 | 1.98 | | 9.5 |

Remarks :

Average percentage of soft particles in Aggregate by weight is 10.4% (Average of two test)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 25.6.1987

Sample: TMK-3/Test 1  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 2397 | 3414 | 1626 | 3673 | 7960 | | 19,070 |
| Weight Parcentage (%) | ② | 12.57 | 17.90 | 8.53 | 19.26 | 41.74 | | |
| Weight of Before Testing (g) | ③ | 2397 | 3414 | - | 3673 | 7960 | | |
| Number of Particles | ④ | 952 | 500 | - | 80 | 49 | | |
| Weight of Soft Particles (g) | ⑤ | 399.3 | 545.2 | - | 163.7 | 141.7 | | |
| Number of Soft Particles | ⑥ | 191 | 98 | - | 7 | 1 | | |
| Weight Parcentage of Soft Particles (⑤ /③) ×100 (%) | ⑦ | 16.65 | 15.96 | 10.22 | 4.47 | 1.78 | | |
| Number Parcentage of Soft Particles (⑥ /④) ×100 (%) | ⑧ | 20.06 | 19.60 | - | 8.75 | 2.04 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 2.09 | 2.86 | 0.87 | 0.86 | 0.74 | | 7.4 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 25.6.1987

Sample: TMK-3/Test 2  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 2711 | 3683 | 2192 | 4237 | 8611 | | 21434 |
| Weight Parcentage (%) | ② | 12.65 | 17.18 | 10.23 | 19.77 | 40.17 | | |
| Weight of Before Testing (g) | ③ | 2711 | 3683 | 2192 | 4237 | 8611 | | |
| Number of Particles | ④ | 1107 | 544 | 118 | 84 | 42 | | |
| Weight of Soft Particles (g) | ⑤ | 512 | 831 | 352 | 550 | 127 | | |
| Number of Soft Particles | ⑥ | 265 | 119 | 25 | 13 | 1 | | |
| Weight Parcentage of Soft Particles (%) (⑤ /③) ×100 | ⑦ | 18.87 | 22.57 | 16.05 | 12.98 | 1.47 | | |
| Number Parcentage of Soft Particles (%) (⑥ /④) ×100 | ⑧ | 23.94 | 21.87 | 21.19 | 15.48 | 2.38 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 2.39 | 3.88 | 1.64 | 2.57 | 0.59 | | 11.1 |

Remarks :

Average percentage of soft particles in Aggregate by weight is 9.3% (Average of two test)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 27.6.1987

Sample: TMK-4/Test 1  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 947 | 1016 | 2788 | 4382 | 6204 | | 15337 |
| Weight Parcentage (%) | ② | 6.17 | 6.62 | 18.18 | 28.57 | 40.45 | | |
| Weight of Before Testing (g) | ③ | - | - | 2788 | 4382 | 6204 | | |
| Number of Particles | ④ | - | - | 150 | 81 | 38 | | |
| Weight of Soft Particles (g) | ⑤ | - | - | 231 | 302 | 337 | | |
| Number of Soft Particles | ⑥ | - | - | 16 | 9 | 2 | | |
| Weight Parcentage of Soft Particles (⑤ /③) ×100 (%) | ⑦ | 8.29 | 8.29 | 8.29 | 6.89 | 5.43 | | |
| Number Parcentage of Soft Particles (⑥ /④) ×100 (%) | ⑧ | - | - | 10.67 | 11.11 | 5.26 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 0.51 | 0.55 | 1.51 | 1.97 | 2.20 | | 6.7 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 27.6.1987

Sample: TMK-4/Test 2  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1610 | 2438 | 2805 | 4477 | 6072 | | 17,402 |
| Weight Parcentage (%) | ② | 9.25 | 14.01 | 16.12 | 25.73 | 34.89 | | |
| Weight of Before Testing (g) | ③ | 1610 | 2438 | 2805 | 4477 | 6072 | | |
| Number of Particles | ④ | - | 348 | 145 | 94 | 32 | | |
| Weight of Soft Particles (g) | ⑤ | - | 284 | 368 | 65 | 275 | | |
| Number of Soft Particles | ⑥ | - | 48 | 25 | 2 | 1 | | |
| Weight Parcentage of Soft Particles (⑤ /③) ×100 (%) | ⑦ | 11.65 | 11.65 | 13.12 | 1.45 | 4.53 | | |
| Number Parcentage of Soft Particles (⑥ /④) ×100 (%) | ⑧ | - | 13.79 | 17.24 | 2.13 | 3.13 | | |
| Weight Parcentage of Soft Particles in Aggregates (②×⑦) / 100 (%) | ⑨ | 1.08 | 1.63 | 2.11 | 0.37 | 1.58 | | 6.8 |

Remarks :

Average percentage of soft particles in Aggregate by weight is 6.8% (Average of two test)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project Small Hydro Study For Mukoh Date 17.6.1987

Sample TMK-5/Test 1 Tested by K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1293 | 2285 | 2052 | 3972 | 5972 | | 15,574 |
| Weight Parcentage (%) | ② | 8.30 | 14.67 | 13.18 | 25.50 | 38.35 | | |
| Weight of Before Testing (g) | ③ | - | 2285 | 2052 | 3972 | 5972 | | |
| Number of Particles | ④ | - | 321 | 115 | 74 | 34 | | |
| Weight of Soft Particles (g) | ⑤ | - | 175 | 186 | 17 | 266 | | |
| Number of Soft Particles | ⑥ | - | 24 | 13 | 1 | 3 | | |
| Weight Parcentage of Soft Particles (⑤/③) ×100 (%) | ⑦ | 7.66 | 7.66 | 9.06 | 0.43 | 4.45 | | |
| Number Parcentage of Soft Particles (⑥/④) ×100 (%) | ⑧ | - | 7.48 | 11.30 | 1.35 | 8.82 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 0.64 | 1.12 | 1.19 | 0.11 | 1.71 | | 4.8 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 17.6.1987

Sample: TMK-5/Test 2  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1158 | 1963 | 2529 | 5128 | 6457 | | 17,235 |
| Weight Parcentage (%) | ② | 6.72 | 11.39 | 14.67 | 29.75 | 37.46 | | |
| Weight of Before Testing (g) | ③ | - | 1963 | 2529 | 5128 | 6457 | | |
| Number of Particles | ④ | - | 252 | 138 | 106 | 33 | | |
| Weight of Soft Particles (g) | ⑤ | - | 135 | 201 | 145 | 98 | | |
| Number of Soft Particles | ⑥ | - | 24 | 16 | 7 | 1 | | |
| Weight Parcentage of Soft Particles (%) (⑤ /③) ×100 | ⑦ | 6.88 | 6.88 | 7.95 | 2.83 | 1.51 | | |
| Number Parcentage of Soft Particles (%) (⑥ /④) ×100 | ⑧ | - | 9.52 | 11.59 | 6.60 | 3.03 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 0.46 | 0.78 | 1.17 | 0.84 | 0.57 | | 3.8 |

Remarks :

Average percentage of soft particles in Aggregate by weight is 4.3% (Average of two test)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 3.7.1987

Sample: TMK-6/Test 1  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 543 | 988 | 1105 | 1887 | 5157 | | 9680 |
| Weight Parcentage (%) | ② | 5.61 | 10.21 | 11.42 | 19.49 | 53.27 | | |
| Weight of Before Testing (g) | ③ | - | 988 | 1105 | 1887 | 5157 | | |
| Number of Particles | ④ | - | 210 | 84 | 53 | 40 | | |
| Weight of Soft Particles (g) | ⑤ | - | 543 | 502 | 747 | 2143 | | |
| Number of Soft Particles | ⑥ | - | 134 | 51 | 29 | 20 | | |
| Weight Parcentage of Soft Particles (%) (⑤ /③) ×100 | ⑦ | 54.96 | 54.96 | 45.43 | 39.59 | 41.56 | | |
| Number Parcentage of Soft Particles (%) (⑥ /④) ×100 | ⑧ | - | 63.81 | 60.71 | 54.72 | 50.00 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 3.08 | 5.61 | 5.19 | 7.72 | 22.14 | | 43.7 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 3.7.1987

Sample: TMK-6/Test 2  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 616 | 905 | 1051 | 1973 | 5097 | | 9642 |
| Weight Parcentage (%) | ② | 6.39 | 9.39 | 10.90 | 20.46 | 52.86 | | |
| Weight of Before Testing (g) | ③ | - | - | 1051 | 1973 | 5097 | | |
| Number of Particles | ④ | - | - | 75 | 45 | 24 | | |
| Weight of Soft Particles (g) | ⑤ | - | - | 448 | 1043 | 986 | | |
| Number of Soft Particles | ⑥ | - | - | 44 | 29 | 10 | | |
| Weight Parcentage of Soft Particles (%) (⑤ /③) ×100 | ⑦ | 42.63 | 42.63 | 42.63 | 52.86 | 19.34 | | |
| Number Parcentage of Soft Particles (%) (⑥ /④) ×100 | ⑧ | - | - | 58.67 | 64.44 | 41.67 | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 2.72 | 4.00 | 4.65 | 10.82 | 10.23 | | 32.4 |

Remarks :

Average percentage of soft particles in Aggregate by weight is 38.1% (Average of two test)

GEOTECHNIQUE-EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 25.8.1987

Sample: TMK-7/Test 1 (Crushed Rock)  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1055.6 | 844.0 | 103 | 21.5 | - | | 2024.1 |
| Weight Parcentage (%) | ② | 52.15 | 41.70 | 5.09 | 1.06 | - | | 100 |
| Weight of Before Testing (g) | ③ | 1055.6 | 844.0 | - | - | - | | |
| Number of Particles | ④ | 501 | 193 | - | - | - | | |
| Weight of Soft Particles (g) | ⑤ | 34.90 | 34.8 | - | - | - | | |
| Number of Soft Particles | ⑥ | 16 | 7 | - | - | - | | |
| Weight Parcentage of Soft Particles (⑤ /③) ×100 (%) | ⑦ | 3.31 | 4.12 | 4.12 | 4.12 | - | | |
| Number Parcentage of Soft Particles (⑥ /④) ×100 (%) | ⑧ | 3.19 | 3.63 | - | - | - | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 1.73 | 1.72 | 0.21 | 0.04 | - | | 3.70 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | SCRATCH HARDNESS OF SOFT PARTICLES IN GRAVEL | ASTM C 235 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 25.8.1987

Sample: TMK-7/Test 2 (Crushed Rock)  Tested by: K.H.F.

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | ① | 1072.2 | 887.2 | 88.6 | 31.4 | - | | 2079.4 |
| Weight Parcentage (%) | ② | 51.56 | 42.67 | 4.26 | 1.51 | - | | 100 |
| Weight of Before Testing (g) | ③ | 1072.2 | 887.2 | - | - | - | | |
| Number of Particles | ④ | 475 | 184 | - | - | - | | |
| Weight of Soft Particles (g) | ⑤ | 10.4 | 9.5 | - | - | - | | |
| Number of Soft Particles | ⑥ | 5 | 2 | - | - | - | | |
| Weight Parcentage of Soft Particles (⑤ /③) ×100 (%) | ⑦ | 0.97 | 1.07 | 1.07 | 1.07 | - | | |
| Number Parcentage of Soft Particles (⑥ /④) ×100 (%) | ⑧ | 1.05 | 1.09 | - | - | - | | |
| Weight Parcentage of Soft Particles in Aggregates (%) (②×⑦) / 100 | ⑨ | 0.50 | 0.46 | 0.05 | 0.02 | - | | 1.03 |

Remarks :

Average Percentage of soft particles in aggregate by weight = 2.4 (Average of two test)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | Soundness of Aggregates by Use of Sodium Sulphate | ASTM C 88 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 1.7.1987

Sample: TMK-2  Tested by: L.S.M.

## Soundness of Sand

| Particle Size (mm) | | 0.3-0.6 | 0.6-1.2 | 1.2-2.5 | 2.5-5.0 | 5.0-10.0 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | 812.6 | 366.3 | 581.5 | 1215.3 | 1921.0 | | 4896.7 |
| Grading of Original Sample (%) | ① | 16.6 | 7.5 | 11.9 | 24.8 | 39.2 | | 100 |
| Weight of Before Testing (g) | ② | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | | |
| Weight of After Testing (g) | ③ | 91.8 | 91.0 | 96.5 | 93.2 | 90.3 | | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | 8.2 | 9.0 | 3.5 | 6.8 | 9.7 | | |
| Weight Percentage of Loss Aggregates (① × ④/100) (%) | ⑤ | 1.36 | 0.67 | 0.42 | 1.69 | 3.81 | | 8.0 |

## Soundness of Gravel

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | 60-80 | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | 1241 | 2038 | 1667 | 3526 | 4239 | 0 | 12711 |
| Grading of Orginal Sample (%) | ① | 9.8 | 16.0 | 13.1 | 27.7 | 33.4 | - | 100 |
| Weight of Before Testing (g) | ② | 500.6 | 749.4 | 814.6 | 1523.0 | 2149.5 | - | |
| Weight of After Testing (g) | ③ | 461.9 | 653.0 | 700.0 | 1487.8 | 2029.8 | - | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | 7.7 | 12.9 | 14.1 | 2.3 | 5.6 | - | |
| Weight Percentage of Loss Aggregates (① × ④/100) (%) | ⑤ | 0.75 | 2.06 | 1.85 | 0.64 | 1.87 | - | 7.2 |

Remarks : Sieves of 1.18mm, 2.36mm, 14.0mm, 19.0mm, 25.4mm, 38.1mm, 63.5mm and 76.2mm were used instead of 1.2mm, 2.5mm, 15.0mm, 20.0mm, 25.0mm, 40.0mm, 60.0mm and 80.0mm.

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | Soundness of Aggregates by Use of Sodium Sulphate | ASTM C 88 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 1.7.1987

Sample: TMK-3  Tested by: L.S.M.

## Soundness of Sand

| Particle Size (mm) | | 0.3-0.6 | 0.6-1.2 | 1.2-2.5 | 2.5-5.0 | 5.0-10.0 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | 1019.4 | 840.1 | 1066.1 | 1355.0 | 2023.8 | | 6304.4 |
| Grading of Original Sample (%) | ① | 16.2 | 13.3 | 16.9 | 21.5 | 32.1 | | 100 |
| Weight of Before Testing (g) | ② | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | | |
| Weight of After Testing (g) | ③ | 92.0 | 93.9 | 94.8 | 89.4 | 90.8 | | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | 8.0 | 6.1 | 5.2 | 10.6 | 9.2 | | |
| Weight Percentage of Loss Aggregates (① x ④/100) (%) | ⑤ | 1.30 | 0.81 | 0.88 | 2.28 | 2.95 | | 8.2 |

## Soundness of Gravel

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | 60-80 | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | 1275 | 2031 | 2431 | 4106 | 8402 | 3521 | 21766 |
| Grading of Orginal Sample (%) | ① | 5.9 | 9.3 | 11.2 | 18.9 | 38.6 | 16.2 | 100 |
| Weight of Before Testing (g) | ② | 499.3 | 754.0 | 1006.7 | 1514.2 | 4024.0 | 3508.0 | |
| Weight of After Testing (g) | ③ | 477.6 | 726.9 | 904.6 | 1437.7 | 3768.7 | 3396.1 | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | 4.4 | 3.6 | 10.1 | 5.1 | 6.3 | 3.2 | |
| Weight Percentage of Loss Aggregates (① x ④/100) (%) | ⑤ | 0.26 | 0.33 | 1.13 | 0.96 | 2.43 | 0.52 | 5.6 |

Remarks : Sieves of 1.18mm, 2.36mm, 14.0mm, 19.0mm, 25.4mm, 38.1mm, 63.5mm and 76.2mm were used instead of 1.2mm, 2.5mm, 15.0mm, 20.0mm, 25.0mm, 40.0mm, 60.0mm and 80.0mm.

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | Soundness of Aggregates by Use of Sodium Sulphate | ASTM C 88 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 3.7.1987

Sample: TMK-6  Tested by: L.S.M.

## Soundness of Sand

| Particle Size (mm) | | 0.3-0.6 | 0.6-1.18 | 1.18-2.36 | 2.36-5.0 | 5.0-10.0 | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | 480.4 | 543.7 | 661.1 | 936.0 | 2297.2 | | 4918.4 |
| Grading of Original Sample (%) | ① | 9.8 | 11.1 | 13.4 | 19.0 | 46.7 | | 100 |
| Weight of Before Testing (g) | ② | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | | |
| Weight of After Testing (g) | ③ | 88.7 | 80.7 | 90.6 | 86.6 | 79.5 | | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | 11.3 | 19.3 | 9.4 | 13.4 | 20.5 | | |
| Weight Percentage of Loss Aggregates (① × ④/100) (%) | ⑤ | 1.11 | 2.14 | 1.26 | 2.55 | 9.57 | | 16.6 |

## Soundness of Gravel

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | 25-40 | 40-60 | 60-80 | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | 1606.7 | 1552.3 | 1901.7 | 2598.3 | 6938.2 | 822.2 | 15419.4 |
| Grading of Orginal Sample (%) | ① | 10.4 | 10.1 | 12.3 | 16.9 | 45.0 | 5.3 | 100 |
| Weight of Before Testing (g) | ② | 500.3 | 751.0 | 1011.5 | 1511.0 | 3063.4 | 822.2 | |
| Weight of After Testing (g) | ③ | 488.9 | 620.0 | 884.5 | 1225.5 | 2482.3 | 821.6 | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | 2.3 | 17.4 | 12.6 | 18.9 | 19.0 | 0.1 | |
| Weight Percentage of Loss Aggregates (① × ④/100) (%) | ⑤ | 0.24 | 1.76 | 1.55 | 3.19 | 8.55 | 0.01 | 15.3 |

Remarks : Sieves of 1.18mm, 2.36mm, 14.0mm, 19.0mm, 25.4mm, 38.1mm, 63.5mm and 76.2mm were used instead of 1.2mm, 2.5mm, 15.0mm, 20.0mm, 25.0mm, 40.0mm, 60.0mm and 80.0mm.

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | Soundness of Aggregates by Use of Sodium Sulphate | ASTM C 88 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 14.7.1987

Sample: TMK-7 (Crushed Rock)  Tested by: L.S.M.

## Soundness of Sand

| Particle Size (mm) | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | | | | | | | |
| Grading of Original Sample (%) | ① | | | | | | | |
| Weight of Before Testing (g) | ② | | | | | | | |
| Weight of After Testing (g) | ③ | | | | | | | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | | | | | | | |
| Weight Percentage of Loss Aggregates (① x ④/100) (%) | ⑤ | | | | | | | |

## Soundness of Gravel

| Particle Size (mm) | | 10-15 | 15-20 | 20-25 | | | | Total |
|---|---|---|---|---|---|---|---|---|
| Weight of Each Size (g) | | 500.8 | 753.2 | 1002.8 | | | | 2256.8 |
| Grading of Orginal Sample (%) | ① | 22.2 | 33.4 | 44.4 | | | | 100 |
| Weight of Before Testing (g) | ② | 500.8 | 753.2 | 1002.8 | | | | |
| Weight of After Testing (g) | ③ | 496.9 | 740.4 | 976.8 | | | | |
| Weight Parcentage of Each Size Loss Particle (1 −③/②)×100 (%) | ④ | 0.8 | 1.7 | 2.6 | | | | |
| Weight Percentage of Loss Aggregates (① x ④/100) (%) | ⑤ | 0.18 | 0.57 | 1.15 | | | | 1.9 |

Remarks : Sieves of 14.0mm & 19.0mm were used instead of 15mm & 20mm

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 26.6.1987

Sample: TMK-2/Test 1 (Grading A)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | A | 12 | 1250 |
| 20 | 15 | | | A | 12 | 1250 |
| 25 | 20 | | | A | 12 | 1252 |
| 40 | 25 | | | A | 12 | 1255 |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5007 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3392 |
| ③ Weight of Abrasion loss ①−② (g) | 1615 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 32.3 |

Remarks:

ASTM C131 grading by A

Mean of Abrasion loss percent of TMK-2 = 23.6%

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 29.6.1987

Sample: TMK-2/Test 2 (Grading A)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | A | 12 | 1250 |
| 20 | 15 | | | A | 12 | 1250 |
| 25 | 20 | | | A | 12 | 1250 |
| 40 | 25 | | | A | 12 | 1250 |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5000 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3275 |
| ③ Weight of Abrasion loss ①−② (g) | 1725 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 34.5 |

Remarks:

ASTM C131 grading by A

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 26.6.1987

Sample: TMK-2/Test 1 (Grading C)  Tested by: K.H.F.

| Sieve (mm) Passing | Sieve (mm) Retained | Weight of Each Size (g) | Weight Percentage (%) | Grading | Number of Spheres | ① Weight of Before Testing (g) |
|---|---|---|---|---|---|---|
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2500 |
| 15 | 10 | | | C | 8 | 2500 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5000 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3692 |
| ③ Weight of Abrasion loss ①−② (g) | 1308 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 26.2 |

Remarks:

ASTM C131 grading by C

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131<br>ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 29.6.1987

Sample: TMK-2/Test 2 (Grading C)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2500 |
| 15 | 10 | | | C | 8 | 2500 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5000 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3537 |
| ③ Weight of Abrasion loss ①−② (g) | 1463 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 29.3 |

Remarks:

ASTM C131 grading by C

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 26.6.1987

Sample: TMK-2/Test 1 (Grading E)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | | | |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | E | 12 | 2500 |
| 60 | 50 | | | E | 12 | 2500 |
| 80 | 60 | | | E | 12 | 5000 |
| Total: | | | | | | 10000 |

| | | |
|---|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | | 8312 |
| ③ Weight of Abrasion loss | ①−② (g) | 1688 |
| ④ Percent of Abrasion loss | $\frac{③}{①} \times 100$ (%) | 16.9 |

Remarks:

JIS A1121 grading by E
(The same as ASTM C535 grading 1)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 29.6.1987

Sample: TMK-2/Test 2 (Grading E)  Tested by: K.H.F.

| Sieve (mm) Passing | Sieve (mm) Retained | Weight of Each Size (g) | Weight Percentage (%) | Grading | Number of Spheres | ① Weight of Before Testing (g) |
|---|---|---|---|---|---|---|
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | | | |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | E | 12 | 2500 |
| 60 | 50 | | | E | 12 | 2500 |
| 80 | 60 | | | E | 12 | 5000 |
| Total: | | | | | | 10000 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 8366 |
| ③ Weight of Abrasion loss ①−② (g) | 1634 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 16.3 |

Remarks:

JIS A1121 grading by E
(The same as ASTM C535 grading 1)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 25.6.1987

Sample: TMK-3/Test 1 (Grading A)  Tested by: K.H.F.

| Sieve (mm) Passing | Sieve (mm) Retained | Weight of Each Size (g) | Weight Percentage (%) | Grading | Number of Spheres | ① Weight of Before Testing (g) |
|---|---|---|---|---|---|---|
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | A | 12 | 1250 |
| 20 | 15 | | | A | 12 | 1255 |
| 25 | 20 | | | A | 12 | 1253 |
| 40 | 25 | | | A | 12 | 1252 |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5010 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3232 |
| ③ Weight of Abrasion loss ①−② (g) | 1778 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 35.5 |

Remarks:

ASTM C131 grading by A
Mean of Abrasion loss percent of TMK-3 = 24.5%

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 29.6.1987

Sample: TMK-3/Test 2 (Grading A)  Tested by: K.H.F.

| Sieve (mm) Passing | Sieve (mm) Retained | Weight of Each Size (g) | Weight Percentage (%) | Grading | Number of Spheres | ① Weight of Before Testing (g) |
|---|---|---|---|---|---|---|
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | A | 12 | 1250 |
| 20 | 15 | | | A | 12 | 1250 |
| 25 | 20 | | | A | 12 | 1250 |
| 40 | 25 | | | A | 12 | 1254 |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5004 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3303 |
| ③ Weight of Abrasion loss ①−② (g) | 1701 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 34.0 |

Remarks:

ASTM C131 grading by A

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 25.6.1987

Sample: TMK-3/Test 1 (Grading C)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2506 |
| 15 | 10 | | | C | 8 | 2500 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5006 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3536 |
| ③ Weight of Abrasion loss ①−② (g) | 1470 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 29.4 |

Remarks:

ASTM C131 grading by C

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 29.6.1987

Sample: TMK-3/Test 2 (Grading C)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2506 |
| 15 | 10 | | | C | 8 | 2500 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5006 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3518 |
| ③ Weight of Abrasion loss ①−② (g) | 1488 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 29.7 |

Remarks:

ASTM C131 grading by C

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 25.6.1987

Sample: TMK-3/Test 1 (Grading E)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | | | |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | E | 12 | 2500 |
| 60 | 50 | | | E | 12 | 2500 |
| 80 | 60 | | | E | 12 | 5000 |
| Total: | | | | | | 10000 |

| | | |
|---|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | | 8328 |
| ③ Weight of Abrasion loss | ①−② (g) | 1672 |
| ④ Percent of Abrasion loss | $\frac{③}{①} \times 100$ (%) | 16.7 |

Remarks:
JIS A1121 grading by E
(The same as ASTM C535 grading 1)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 29.6.1987

Sample: TMK-3/Test 2 (Grading E)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | | | |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | E | 12 | 2500 |
| 60 | 50 | | | E | 12 | 2500 |
| 80 | 60 | | | E | 12 | 5012 |
| Total: | | | | | | 10012 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 8338 |
| ③ Weight of Abrasion loss ①−② (g) | 1674 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 16.7 |

Remarks:

JIS A1121 grading by E
(The same as ASTM C535 grading 1)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 11.7.1987

Sample: TMK-6/Test 1 (Grading A)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | A | 12 | 1250 |
| 20 | 15 | | | A | 12 | 1250 |
| 25 | 20 | | | A | 12 | 1250 |
| 40 | 25 | | | A | 12 | 1250 |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5000 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 2995 |
| ③ Weight of Abrasion loss ①−② (g) | 2005 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 40.1 |

Remarks:

ASTM C131 grading by A
Mean of Abrasion loss percent of Tmk-6 = 35.4%

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 11.7.1987

Sample: TMK-6/Test 2 (Grading A)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | A | 12 | 1250 |
| 20 | 15 | | | A | 12 | 1250 |
| 25 | 20 | | | A | 12 | 1250 |
| 40 | 25 | | | A | 12 | 1255 |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5005 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3062 |
| ③ Weight of Abrasion loss ①−② (g) | 1943 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 38.8 |

Remarks:

ASTM C131 grading by A

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 11.7.1987

Sample: TMK-6/Test 1 (Grading C)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2500 |
| 15 | 10 | | | C | 8 | 2505 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5005 |

| | | |
|---|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | | 3408 |
| ③ Weight of Abrasion loss | ①−② (g) | 1597 |
| ④ Percent of Abrasion loss | $\frac{③}{①} \times 100$ (%) | 31.9 |

Remarks:

ASTM C131 grading by C

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 11.7.1987

Sample: TMK-6/Test 2 (Grading C)  Tested by: K.H.F.

| Sieve (mm) Passing | Sieve (mm) Retained | Weight of Each Size (g) | Weight Percentage (%) | Grading | Number of Spheres | ① Weight of Before Testing (g) |
|---|---|---|---|---|---|---|
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2500 |
| 15 | 10 | | | C | 8 | 2500 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5000 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 3265 |
| ③ Weight of Abrasion loss ①−② (g) | 1735 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 34.7 |

Remarks:

ASTM C131 grading by C

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 13.7.1987

Sample: TMK-6/Test 1 (Grading E)  Tested by: K.H.F.

| Sieve (mm) Passing | Sieve (mm) Retained | Weight of Each Size (g) | Weight Percentage (%) | Grading | Number of Spheres | ① Weight of Before Testing (g) |
|---|---|---|---|---|---|---|
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | | | |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | E | 12 | 2511 |
| 60 | 50 | | | E | 12 | 2540 |
| 80 | 60 | | | E | 12 | 5000 |
| Total: | | | | | | 10,051 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 6375 |
| ③ Weight of Abrasion loss ①−② (g) | 3676 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 36.6 |

Remarks:

JIS A1121 grading by E
(The same as ASTM C535 grading 1)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 13.7.1987

Sample: TMK-6/Test 2 (Grading E)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | | | |
| 15 | 10 | | | | | |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | E | 12 | 2514 |
| 60 | 50 | | | E | 12 | 2500 |
| 80 | 60 | | | E | 12 | 5036 |
| Total: | | | | | | 10,050 |

| | |
|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | 6854 |
| ③ Weight of Abrasion loss ①−② (g) | 3196 |
| ④ Percent of Abrasion loss $\frac{③}{①} \times 100$ (%) | 31.8 |

Remarks:

JIS A1121 grading by E
(The same as ASTM C535 grading 1)

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 11.7.1987

Sample: TMK-7/Test 1 (Crushed Rock) (Grading C)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2500 |
| 15 | 10 | | | C | 8 | 2500 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5000 |

| | | |
|---|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | | 3743 |
| ③ Weight of Abrasion loss | ①−② (g) | 1257 |
| ④ Percent of Abrasion loss | $\frac{③}{①} \times 100$ (%) | 25.1 |

Remarks:

ASTM C131 grading by C

Mean of Abrasion loss percent of TMK-7 (Crushed Rock) = 25.1%

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | ABRASION TEST OF GRAVEL (USING THE LOS ANGELES MACHINE) | ASTM C 131 & ASTM C 535 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah  Date: 11.7.1987

Sample: TMK-7/Test 2 (Crushed Rock) (Grading C)  Tested by: K.H.F.

| Sieve (mm) | | Weight of Each Size | Weight Percentage | Grading | Number of Spheres | ① Weight of Before Testing |
|---|---|---|---|---|---|---|
| Passing | Retained | (g) | (%) | | | (g) |
| 2.5 | | | | | | |
| 5 | 2.5 | | | | | |
| 10 | 5 | | | C | 8 | 2500 |
| 15 | 10 | | | C | 8 | 2500 |
| 20 | 15 | | | | | |
| 25 | 20 | | | | | |
| 40 | 25 | | | | | |
| 50 | 40 | | | | | |
| 60 | 50 | | | | | |
| 80 | 60 | | | | | |
| Total: | | | | | | 5000 |

| | | |
|---|---|---|
| ② Weight of Retained on 1.7mm Sieve After Testing (g) | | 3748 |
| ③ Weight of Abrasion loss | ①−② (g) | 1252 |
| ④ Percent of Abrasion loss | $\frac{③}{①} \times 100$ (%) | 25.0 |

Remarks:

ASTM C131 grading by C

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( SAND ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh — Date: 12.6.1987

Sample: TMK-1 — Tested by: B.C.L.

Inside Diameter of Mold: 15 cm — Volume ①: 2305 $cm^3$

Number of Blows: 25 — Layers: 3

Moisture Condition of Sample: 13.32 %

Specific Gravity(SSD) ②: 2.51 — Absorption ③: 1.18 %

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 12.6.1987 | 12.6.1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 13,000 | 13,000 | |
| Weight of Mold (g) | ⑤ | | 9,000 | 9,000 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 4,000 | 4,000 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.735 | 1.735 | 1.735 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 69.9 | 69.9 | 69.9 |
| Void Ratio (%) | ⑨ | 100−⑧ | 30.1 | 30.1 | 30.1 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( SAND ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 12.6.1987

Sample: TMK-2  Tested by: B.C.L.

Inside Diameter of Mold: 15 cm  Volume ①: 2305 $cm^3$

Number of Blows: 25  Layers: 3

Moisture Condition of Sample: 15.35 %

Specific Gravity(SSD) ②: 2.52  Absorption ③: 1.08 %

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 12.6.1987 | 12.6.1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 12,500 | 12,500 | |
| Weight of Mold (g) | ⑤ | | 9,000 | 9,000 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 3,500 | 3,500 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.518 | 1.518 | 1.518 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 60.9 | 60.9 | 60.9 |
| Void Ratio (%) | ⑨ | 100−⑧ | 39.1 | 39.1 | 39.1 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( SAND ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukah — Date: 13.6.1987

Sample: TMK-3 — Tested by: B.C.L.

Inside Diameter of Mold: 15 cm — Volume ①: 2305 $cm^3$

Number of Blows: 25 — Layers: 3

Moisture Condition of Sample: 8.12 %

Specific Gravity(SSD) ②: 2.50 — Absorption ③: 2.00 %

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 13.6.1987 | 13.6.1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 12,500 | 12,500 | |
| Weight of Mold (g) | ⑤ | | 9,000 | 9,000 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 3,500 | 3,500 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.518 | 1.518 | 1.518 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 61.9 | 61.9 | 61.9 |
| Void Ratio (%) | ⑨ | 100−⑧ | 38.1 | 38.1 | 38.1 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( SAND ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 1-7-1987

Sample: TMK-6  Tested by: B.C.L.

Inside Diameter of Mold: 15 cm  Volume ①: 2305 $cm^3$

Number of Blows: 25  Layers: 3

Moisture Condition of Sample: 1.301

Specific Gravity (SSD) ②: 2.602  Absorption ③: 4.02

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 1-7-1987 | 1-7-1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 11350 | 11380 | |
| Weight of Mold (g) | ⑤ | | 7305 | 7305 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 4045 | 4075 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.755 | 1.768 | 1.761 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 70.2 | 70.7 | 70.5 |
| Void Ratio (%) | ⑨ | 100−⑧ | 29.8 | 29.3 | 29.6 |
| | | | | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( GRAVEL ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh — Date: 12.6.1987

Sample: TMK-1 — Tested by: B.C.L.

Inside Diameter of Mold: 30 cm — Volume ①: 21500 $cm^3$

Number of Blows: 25 — Layers: 3

Moisture Condition of Sample: 6.20 %

Specific Gravity(SSD) ②: 2.498 — Absorption ③: 1.99 %

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 12.6.1987 | 12.6.1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 47,000 | 48,000 | |
| Weight of Mold (g) | ⑤ | | 10,000 | 10,000 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 37,000 | 38,000 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.721 | 1.767 | 1.744 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 70.3 | 72.1 | 71.2 |
| Void Ratio (%) | ⑨ | 100−⑧ | 29.7 | 27.9 | 28.8 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( GRAVEL ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh — Date: 12.6.1987

Sample: TMK-2 — Tested by: B.C.L.

Inside Diameter of Mold: 30 cm — Volume ①: 21500 $cm^3$

Number of Blows: 25 — Layers: 3

Moisture Condition of Sample: 9.15 %

Specific Gravity(SSD) ②: 2.555 — Absorption ③: 1.24 %

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 12.6.1987 | 12.6.1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 48,000 | 49,000 | |
| Weight of Mold (g) | ⑤ | | 10,000 | 10,000 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 38,000 | 39,000 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.767 | 1.814 | 1.791 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 70.4 | 72.2 | 71.3 |
| Void Ratio (%) | ⑨ | 100−⑧ | 29.6 | 27.8 | 28.7 |
| | | | | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( GRAVEL ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh  Date: 13.6.1987

Sample: TMK-3  Tested by: B.C.L.

Inside Diameter of Mold: 30 cm  Volume ①: 21500 $cm^3$

Number of Blows: 25  Layers: 3

Moisture Condition of Sample: 5.35 %

Specific Gravity(SSD) ②: 2.533  Absorption ③: 1.02 %

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 13.6.1987 | 13.6.1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 48,000 | 49,000 | |
| Weight of Mold (g) | ⑤ | | 10,000 | 10,000 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 38,000 | 39,000 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.767 | 1.814 | 1.791 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 70.5 | 72.3 | 71.4 |
| Void Ratio (%) | ⑨ | 100−⑧ | 29.5 | 27.7 | 28.6 |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | UNIT WEIGHT TEST OF AGGREGATES ( GRAVEL ) | ASTM C 29 |
|---|---|---|

Name of Project: Small Hydro Study For Mukoh — Date: 1-7-1987

Sample: TMK-6 — Tested by: B.C.L.

Inside Diameter of Mold: 30 cm — Volume ①: 21285 $cm^3$

Number of Blows: 25 — Layers: 3

Moisture Condition of Sample: 6.64

Specific Gravity(SSD) ②: 2.621 — Absorption ③: 3.53

| Specimen NO. | | | 1 | 2 | Mean Value |
|---|---|---|---|---|---|
| Date of Specimen Made | | | 1-7-1987 | 1-7-1987 | |
| Mold No. | | | | | |
| Weight of (Specimen + Mold) (g) | ④ | | 45967 | 45670 | |
| Weight of Mold (g) | ⑤ | | 8385 | 8385 | |
| Weight of Specimen (g) | ⑥ | ④−⑤ | 37582 | 37285 | |
| Unit Weight ($t/m^3$) | ⑦ | ⑥/① | 1.766 | 1.752 | 1.759 |
| Solid Volume Percentage (%) | ⑧ | $\frac{⑦*(100+③)}{②}$ | 69.7 | 69.2 | 69.5 |
| Void Ratio (%) | ⑨ | 100−⑧ | 30.2 | 30.8 | 30.5 |
| | | | | | |

Remarks :

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | COMPRESSIVE STRENGTH | ASTM D 2938 |
|---|---|---|

Name of Project: Small Hydro Study for Mukah  Date: 20.7.1987

Sample: BMK1/Sample A  Tested by: C. H. Wang

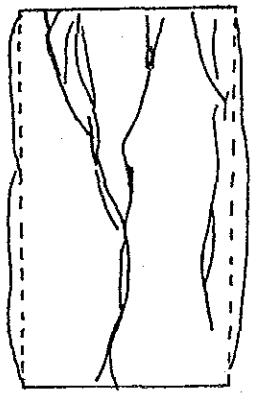
Moisture Condition of Sample: (Saturated)

Specific Gravity: -  Unit Weight 2.59 $Mg/m^3$  Absorption: 0.74 %

Rate of loading: 90 KN Per Minute  Rock Type: SILTSTONE

| Sample No | Depth | Diameter (cm) | Height (cm) | Compressive Strength ($kg/cm^2$) |
|---|---|---|---|---|
| BMK1/Sample A | 5.55 - 5.75m | 5.40 | 10.2 | 345.48 |
| | | | | |
| | | | | |
| Mean Value | | | | |

Remarks :



Failure along weak subvertical plane

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | COMPRESSIVE STRENGTH | ASTM D 2938 |
|---|---|---|

Name of Project: Small Hydro Study for Mukoh  Date: 20.7.1987

Sample: BMK1/Sample B  Tested by: C. H. Wang

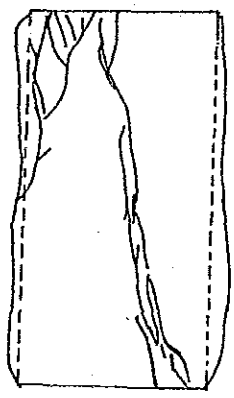
Moisture Condition of Sample: (Saturated)

Specific Gravity: -  Unit Weight: 2.62 $Mg/m^3$  Absorption: 0.40 %

Rate of loading: 90 KN Per Minute  Rock Type: SILTSTONE

| Sample No | Depth | Diameter (cm) | Height (cm) | Compressive Strength ($kg/cm^2$) |
|---|---|---|---|---|
| BMK1/Sample B | 12.70 - 12.95m | 5.40 | 10.40 | 323.86 |
| | | | | |
| | | | | |
| Mean Value | | | | |

Remarks :



*Failure along weak subvertical plane*

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | COMPRESSIVE STRENGTH | ASTM D 2938 |
|---|---|---|

Name of Project: Small Hydro Study for Mukoh  Date: 20.7.1987

Sample: BMK2/Sample A  Tested by: C. H. Wang

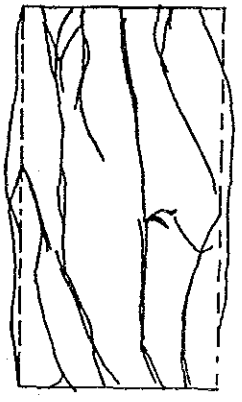
Moisture Condition of Sample: 0.83 % (In-Situ)

Specific Gravity: - Unit Weight 2.76 $Mg/m^3$  Absorption:

Rate of loading: 90 KN Per Minute  Rock Type: SILTSTONE

| Sample No | Depth | Diameter (cm) | Height (cm) | Compressive Strength ($kg/cm^2$) |
|---|---|---|---|---|
| BMK2/Sample A | 10.70 - 10.95m | 5.40 | 9.80 | 214.34 |
| | | | | |
| | | | | |
| Mean Value | | | | |

Remarks :



Failure along weak subvertical plane

GEOTECHNIQUE EAST MALAYSIA SDN. BHD.

| Name of Test | COMPRESSIVE STRENGTH | ASTM D 2938 |
|---|---|---|

Name of Project: Small Hydro Study for Mukah  Date: 20.7.1987

Sample: BMK2/Sample 8  Tested by: C.H. Wang

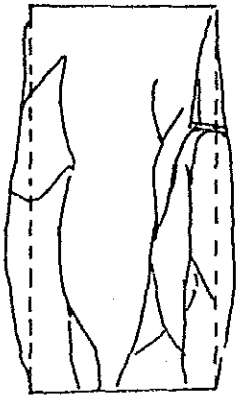
Moisture Condition of Sample: 2.87 % (In-Situ)

Specific Gravity: -  Unit Weight 2.71 $Mg/m^3$  Absorption:

Rate of loading: 90 KN Per Minute  Rock Type: SILTSTONE

| Sample No | Depth | Diameter (cm) | Height (cm) | Compressive Strength ($kg/cm^2$) |
|---|---|---|---|---|
| BMK2/Sample 8 | 11.60 - 11.85m | 5.40 | 9.90 | 214.34 |
| | | | | |
| | | | | |
| Mean Value | | | | |

Remarks :



Failure along weak subvertical plane