

**REPUBLIC OF KENYA**

**MINISTRY OF ROADS AND TRANSPORT**

**STATE DEPARTMENT OF ROADS**

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Ref No. M.1417/35/L/10 Date: 16th January, 2023

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| **Laboratory Test Report** |

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| **1. Customer’s Details:** KENYA URBAN ROADS AUTHORITY  **E-mail:** moseswarugongo@gmail.com  **Address:** P.O.BOX 58160 NAIROBI Phone: 0713967255  **2. Customer Contact:** 0739757378 6. Job Card No. 1128/S/2022  **3. Sample Description:** Alignment Soils 7. Date fee paid: 21/11/2022  **4. Sampled by:** Client. 8. GOK MR No.4107500  **5. Date Sample received:** 21/09/2022 9. Date Analysis started:28/11/2022  **10. Additional information provided by the customer:** Upgrading to Bitumen Standards of Access Roads to Ongata Rongai and Ngong SGR Stations.     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | TEST RESULTS | | | | | | | | | | | | | | | | | | | | | **Sample No.** | **Reference** | **Dosage**% | **Grading** | | | | | | | | | **Atterberg Limits** | | | | | **Compaction T99** | | **CBR** | | | % Passing BS Sieve Size (mm) | | | | | | | | | LL | PL | PI | LS | PM |  | OMC( % ) | 4days Soak  (%) | Swell(%) | | 20 | | 10 | | 5 | 2 | | 0.425 | 0.075 | % | % | % | % |  | MDD Kg/m3 | | 413/S/22 | Km 0+700 Forst line | Neat | 100 | | 100 | | 99 | 99 | | 97 | 94 | 44 | 26 | 18 | 9 | 1746 | 1468 | 15.9 | 4 | 0.3 | | SOIL COMPOSITION: Gravel = 1%, Sand = 5%, Silt/clay =94% | | | | | | | | | | | | | | | | | | | 414/S/22 | Km 2+000 Forst line | Neat | 100 | | 100 | | 95 | 90 | | 81 | 73 | 52 | 32 | 20 | 10 | 1620 | 1356 | 27.8 | 6 | 0.4 | | SOIL COMPOSITION: Gravel = 10%, Sand = 17%, Silt/clay =73% | | | | | | | | | | | | | | | | | | | 415/S/22 | **Km 0+950 Olem** | Neat | 100 | | 100 | | 99 | 99 | | 92 | 76 | 48 | 32 | 16 | 8 | 1472 | 1398 | 26.0 | 7 | 0.3 | | **SOIL COMPOSITION: Gravel = 1%, Sand = 23%, Silt/clay =76%** | | | | | | | | | | | | | | | | | | | 416/S/22 | Km 2+000  LHS Ole | Neat | 100 | | 100 | | 99 | 97 | | 91 | 83 | 48 | 24 | 24 | 12 | 2184 | 1313 | 28.5 | 6 | 1 | | **SOIL COMPOSITION: Gravel = 3%, Sand = 14%, Silt/clay =83%** | | | | | | | | | | | | | | | | | | | 417/S/22 | Km 0+400 Cresent | Neat | 100 | | 99 | | 98 | 96 | | 92 | 83 | 46 | 30 | 16 | 8 | 1472 | 1335 | 26.4 | 5 | 0.3 | | **SOIL COMPOSITION: Gravel = 4%, Sand = 13 %, Silt/clay =83%** | | | | | | | | | | | | | | | | | | | 418/S/22 | Km 1+600 Cresent | Neat | 100 | | 100 | | 99 | 99 | | 93 | 80 | 50 | 30 | 20 | 10 | 1860 | 1369 | 26.3 | 5 | 0.4 | | **SOIL COMPOSITION: Gravel = 1%, Sand = 19%, Silt/clay =80%** | | | | | | | | | | | | | | | | | | | 419/S/22 | Km 3+000 Cresent | Neat | 100 | 100 | | 99 | | | 99 | 97 | 85 | 46 | 27 | 19 | 9 | 1843 | 1346 | 25.5 | 6 | 0.4 | | **SOIL COMPOSITION: Gravel = 1%, Sand = 14%, Silt/clay =85%** | | | | | | | | | | | | | | | | | | |

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|  | TEST RESULTS | | | | | | | | | | | | | | | | | | | |
| **Sample No.** | **Reference** | **Dosage**% | **Grading** | | | | | | | | **Atterberg Limits** | | | | | **Compaction T99** | | | **CBR** | |
| % Passing BS Sieve Size (mm) | | | | | | | | LL | PL | PI | LS | PM |  | OMC( % ) | | 4days Soak  (%) | Swell(%) |
| 20 | 10 | | 5 | 2 | | 0.425 | 0.075 | % | % | % | % |  | MDD Kg/m3 |
| 420/S/22 | Km 0+050 Kibiko | Neat | 100 | 100 | | 99 | 98 | | 94 | 80 | 48 | 33 | 14 | 7 | 1316 | 1332 | 25.2 | | 5 | 0.3 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 18%, Silt/clay =80%** | | | | | | | | | | | | | | | | | |
| 421/S/22 | Km 1+500 Kibiko | Neat | 100 | 99 | | 97 | 92 | | 84 | 74 | 45 | 23 | 22 | 11 | 1848 | 1379 | 25.2 | | 9 | 0.4 |
| **SOIL COMPOSITION: Gravel = 8%, Sand = 18%, Silt/clay =74%** | | | | | | | | | | | | | | | | | |
| 422/S/22 | Km 2+500 Kibiko | Neat | 100 | 100 | | 99 | 98 | | 95 | 88 | 44 | 26 | 18 | 9 | 1710 | 1370 | 26.1 | | 6 | 0.3 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 10%, Silt/clay =88%** | | | | | | | | | | | | | | | | | |
| 423/S/22 | Km 3+600 Kibiko | Neat | 100 | 100 | | 99 | 98 | | 95 | 88 | 49 | 33 | 16 | 8 | 1520 | 1271 | 26.8 | | 4 | 0.3 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 10%, Silt/clay =88%** | | | | | | | | | | | | | | | | | |
| 424/S/22 | Km 1+000 Kibiko | Neat | 100 | 100 | | 99 | 98 | | 91 | 82 | 41 | 27 | 14 | 7 | 1274 | 1421 | 23.4 | | 7 | 0.3 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 16%, Silt/clay =82%** | | | | | | | | | | | | | | | | | |
| 425/S/22 | Km 2+400 Kibiko | Neat | 100 | 100 | | 99 | 99 | | 96 | 83 | 40 | 23 | 18 | 9 | 1728 | 1375 | 20.1 | | 7 | 0.3 |
| **SOIL COMPOSITION: Gravel = 1%, Sand = 16%, Silt/clay =83%** | | | | | | | | | | | | | | | | | |
| 426/S/22 | Km 1+600 A Ngong T | Neat | 100 | 100 | | 99 | 98 | | 94 | 88 | 60 | 32 | 28 | 14 | 2632 | 1435 | 15.5 | | 1 | 1 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 10%, Silt/clay =88%** | | | | | | | | | | | | | | | | | |
| 427/S/22 | Km 0+600 Ngong T | Neat | 100 | 97 | | 95 | 94 | | 90 | 87 | 62 | 32 | 30 | 15 | 2700 | 1320 | 29.7 | | 1 | 2 |
| **SOIL COMPOSITION: Gravel = 6%, Sand = 7%, Silt/clay =87%** | | | | | | | | | | | | | | | | | |
| 428/S/22 | Km 0+300  Ng Lw C | Neat | 100 | 95 | | 82 | 78 | | 70 | 64 | 49 | 27 | 22 | 11 | 1540 | 1285 | 33.2 | | 5 | 0.4 |
| **SOIL COMPOSITION: Gravel = 22%, Sand = 14%, Silt/clay =64%** | | | | | | | | | | | | | | | | | |
| 429/S/22 | Km 0+800 Masai Rd | Neat | 100 | 100 | | 99 | 98 | | 95 | 87 | 51 | 31 | 20 | 10 | 1900 | 1308 | 24.0 | | 5 | 0.4 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 11%, Silt/clay =87%** | | | | | | | | | | | | | | | | | |
| 430/S/22 | Km 2+400 Masai R | Neat | 100 | 100 | | 98 | 97 | | 92 | 87 | 64 | 32 | 32 | 16 | 2944 | 1335 | 31.2 | | 1 | 2.2 |
| **SOIL COMPOSITION: Gravel = 3%, Sand = 10%, Silt/clay =87%** | | | | | | | | | | | | | | | | | |
| 431/S/22 | Km 3+600 Masai R | Neat | 100 | 100 | 99 | | | 98 | 88 | 82 | 59 | 30 | 29 | 15 | 2552 | 1356 | | 30.3 | 1 | 2 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 16%, Silt/clay =82%** | | | | | | | | | | | | | | | | | |

**Eng. J. M. Mbarua**

**For: CHIEF ENGINEER (MATERIALS)**

**OiC Soils Laboratory CSE Soils Laboratory**

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Ref No. M.1417/35/L/10 Date: 16th January, 2023

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| **Laboratory Test Report** |

**1. Customer’s Details:** KENYA URBAN ROADS AUTHORITY

**E-mail:** moseswarugongo@gmail.com

**Address:** P.O.BOX 58160 NAIROBI Phone: 0713967255

**2. Customer Contact:** 0739757378 6. Job Card No. 1128/S/2022

**3. Sample Description:** Alignment Soils 7. Date fee paid: 21/11/2022

**4. Sampled by:** Client. 8. GOK MR No.4107500

**5. Date Sample received:** 21/09/2022 9. Date Analysis started:28/11/2022

**10. Additional information provided by the customer:** Upgrading to Bitumen Standards of Access Roads to Ongata Rongai and Ngong SGR Stations.

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|  | TEST RESULTS | | | | | | | | | | | | | | | | |
| **Sample No.** | **Reference** | **Dosage**% | **Grading** | | | | | | **Atterberg Limits** | | | | | **Compaction T99** | | **CBR** | |
| % Passing BS Sieve Size (mm) | | | | | | LL | PL | PI | LS | PM | MDDKg/m3 | OMC( % ) | 4days Soak  (%) | Swell(%) |
| 20 | 10 | 5 | 2 | 0.425 | 0.075 | % | % | % | % |  |
| 432/S/22 | Km 0+600 Ng SGR | Neat | 100 | 100 | 99 | 98 | 92 | 84 | 58 | 30 | 28 | 14 | 2576 | 1569 | 13.6 | 13 | 1 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 14%, Silt/clay =84%** | | | | | | | | | | | | | | |
| 433/S/22 | Km 3+100 Ng SGR | Neat | 100 | 99 | 98 | 97 | 93 | 88 | 59 | 35 | 25 | 12 | 2325 | 1273 | 24.2 | 1 | 1 |
| **SOIL COMPOSITION: Gravel = 3%, Sand = 9%, Silt/clay =88%** | | | | | | | | | | | | | | |
| 434/S/22 | Km 0+700 Ololua Rd | Neat | 100 | 100 | 99 | 96 | 87 | 81 | 56 | 27 | 29 | 15 | 2523 | 1305 | 29.8 | 1 | 2.1 |
| **SOIL COMPOSITION: Gravel = 4%, Sand = 15%, Silt/clay =81%** | | | | | | | | | | | | | | |
| 435/S/22 | Km 0+150 Ngong T | Neat | 100 | 100 | 99 | 98 | 92 | 84 | 58 | 30 | 28 | 14 | 2576 | 1569 | 13.6 | 13 | 1 |
| **SOIL COMPOSITION: Gravel = 2%, Sand = 14%, Silt/clay =84%** | | | | | | | | | | | | | | |
| 436/S/22 | Km 0+900 5th Ave | Neat | 100 | 86 | 67 | 57 | 48 | 41 | 42 | 22 | 20 | 10 | 960 | 1534 | 18.8 | 15 | 0.4 |
| **SOIL COMPOSITION: Gravel = 43%, Sand = 16%, Silt/clay =41%** | | | | | | | | | | | | | | |

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|  | TEST RESULTS | | | | | | | | | | | | | | | | |
| **Sample No.** | **Reference** | **Dosage**% | **Grading** | | | | | | **Atterberg Limits** | | | | | **Compaction T99** | | **CBR** | |
| % Passing BS Sieve Size (mm) | | | | | | LL | PL | PI | LS | PM |  | OMC( % ) | 4days Soak  (%) | Swell(%) |
| 20 | 10 | 5 | 2 | 0.425 | 0.075 | % | % | % | % |  | MDDKg/m3 |
| 437/S/22 | Km 1+100 Fatima | Neat | 100 | 90 | 79 | 70 | 58 | 53 | 56 | 40 | 16 | 8 | 928 | 1146 | 21.8 | 21 | 0.3 |
| **SOIL COMPOSITION: Gravel = 30%, Sand = 17%, Silt/clay =53%** | | | | | | | | | | | | | | |
| 438/S/22 | Km 0+300 Ro SGR | Neat | 100 | 97 | 95 | 94 | 90 | 87 | 60 | 34 | 26 | 13 | 2340 | 1404 | 17.5 | 1 | 1 |
| **SOIL COMPOSITION: Gravel = 6%, Sand = 7%, Silt/clay =87%** | | | | | | | | | | | | | | |
| 439/S/22 | Km 1+700 RoSGR | Neat | 100 | 98 | 95 | 94 | 91 | 87 | 58 | 28 | 30 | 15 | 2730 | 1434 | 17.5 | 1 | 1 |
| **SOIL COMPOSITION: Gravel = 6%, Sand = 7%, Silt/clay =87%** | | | | | | | | | | | | | | |
| 440/S/22 | Km 1+200 Oloors | Neat | 100 | 81 | 58 | 47 | 38 | 34 | 37 | 18 | 19 | 9 | 722 | 1581 | 16.8 | 28 | 0.4 |
| **SOIL COMPOSITION: Gravel = 53%, Sand = 13%, Silt/clay =34%** | | | | | | | | | | | | | | |
| 441/S/22 | Km 2+600 Oloors | Neat | 100 | 87 | 64 | 52 | 44 | 41 | 42 | 28 | 14 | 7 | 616 | 1290 | 14.8 | 35 | 0.3 |
| **SOIL COMPOSITION: Gravel = 48%, Sand = 11%, Silt/clay =41%** | | | | | | | | | | | | | | |
| 442/S/22 | Km 3+700 Oloors | Neat | 100 | 88 | 73 | 62 | 51 | 48 | 66 | 46 | 20 | 10 | 1020 | 1318 | 17.1 | 19 | 0.4 |
| **SOIL COMPOSITION: Gravel = 38%, Sand = 14%, Silt/clay =48%** | | | | | | | | | | | | | | |

**Eng. J. M. Mbarua**

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