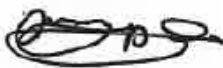



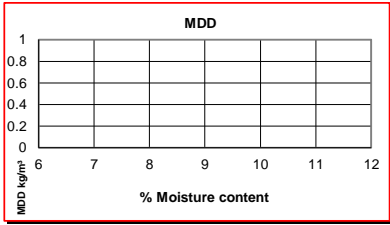
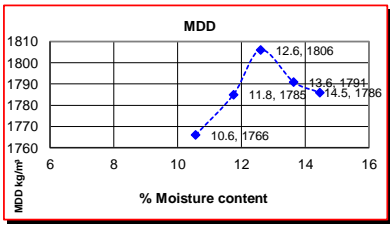
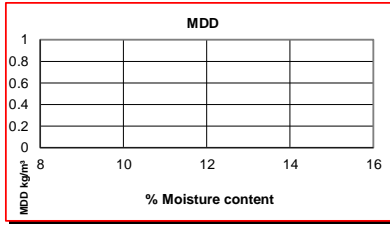
| | | | |
|--|---|--|---------------|
|  EARTHINVLAB | EARTH INVESTIGATION LABORATORIES Plot 209 Tienie Street, Andeon AH, Zandfontein, 0183 P.O. Box 2856, Rosslyn, 0200 Tel: +27 (0)12 372 3023 Fax: +27 (0)86 241 3304 e-mail: admin@earthinv.co.za |  Testing Laboratory T0745 | |
| | | TEST REPORT | |
| | | REPORT # | EIL-398-03-01 |

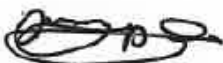
| CLIENT INFORMATION | | | |
|--------------------------------|---|--------------------------|--|
| Client Name: | MMK | Client Number: | 398 |
| Address: | Suite 11, Hillcrest Park 2 Old Main Hillcrest | Project Name: | Southern Aquaduct Durban Heights To High Wycombe Road |
| Primary Contact Person: | Sachin Kistasamy | Telephone Number: | 031 765 7752 |
| Primary Contact email: | sachin.kistasamy@mmkengineers.co.za | Fax Number: | 0 |


| SAMPLES/JOB INFORMATION | | | |
|--------------------------|------------------------------------|----------------------------|-------------------|
| Date Sampled: | 02-Nov-23 | Date Received: | 04-Nov-23 |
| Sampler: | EIL | Date Tested: | 14-Nov-23 |
| Sample Location: | Durban Height To High Wycombe Road | Date Reported: | 22-Nov-23 |
| Sample Method: | TMH 5 MA 2 | Tests Conducted At: | Earthinv Main Lab |
| Sample Condition: | Good | Report Status: | Final |

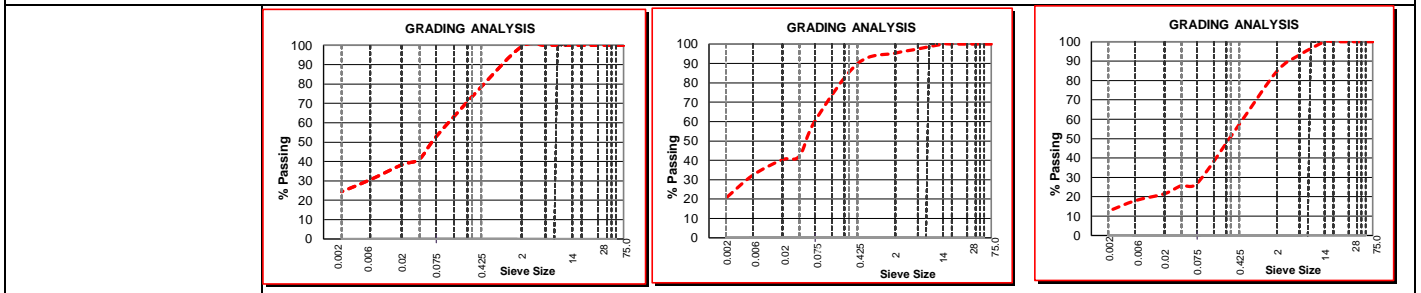
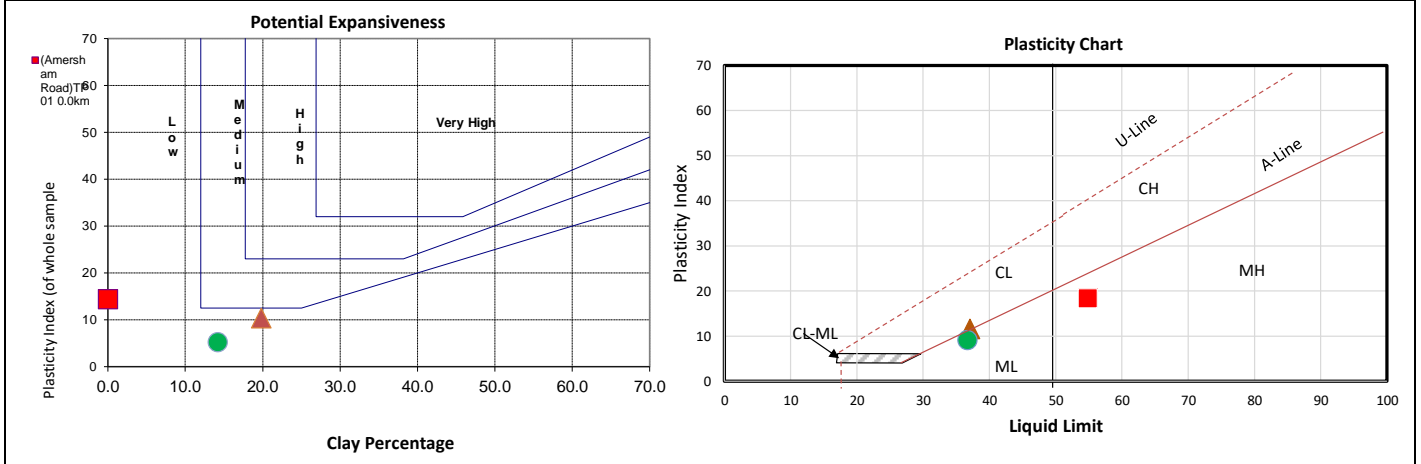
| TEST RESULTS SUMMARY | | | |
|-----------------------------|--|-----|--------------------|
| Test (s) Methods References | Test Method(s) Description (s) | Qty | Test Conducted by. |
| SANS 3001 - GR 1:2013 | Wet preparation & particle size analysis | 5 | Earthinv Main Lab |
| SANS 3001 - GR 3:2014# | Particle size analysis of material smaller than 2mm (hydrometer method) | 5 | Earthinv Main Lab |
| SANS 3001 - GR 10:2013 | Determination of the one-point liquid limit, plastic limit, plasticity index & linear shrinkage | 5 | Earthinv Main Lab |
| SANS 3001 - GR 30:2013 | Determination of the max. dry density & opt. MC | 3 | Earthinv Main Lab |
| SANS 3001 - GR 40:2013 | Determination of the CBR | 3 | Earthinv Main Lab |
| TMH 1 A20 T# | The electronic determination of the pH value of soil suspension | 3 | Earthinv Main Lab |
| TMH 1 A21# | Tentative method for the determination of conductivity of a saturated soil paste & water | 3 | Earthinv Main Lab |
| - | | | - |

| TEST RESULTS NOTES |
|---|
| <p>Tests Deviations and Subcontracting - Test deviations indicated if any on the report and clearly communicated to Client.</p> <p>Documents Reproduction - If a report is published or reproduced by the client, it will be done in full, without any ommittance.</p> <p>Report Status - Only final status results are to be good for publication.</p> <p>Samples Received and Results Relation - Test results relate to sample received and to conditions thereof on receipt</p> <p>Samples Retainment - If not specified by the Client, samples will be disposed off as per the Laboratories discretion</p> <p>Opinions & Recommendations: Opinions & recommendations do not form part of the Labs accreditation schedule</p> <p>SANAS accreditation - Tests results marked # in this report are not included in the SANAS schedule of Accreditation for the Lab</p> |
|  |
| Page 1 of 5 |

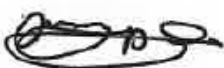
|  EARTHINVLAB | | Earth Inv Lab FINAL REPORT (GRAD, ATT, MDD, CBR) | | | | | | | | | | | | | | | | |
|--|---|---|----|--|---|------|------------|---|---|-----|------|----|-----|----|----|----|----|----|
| CLIENT | MMK | | | | MMK | | | | MMK | | | | | | | | | |
| PROJECT: | Southern Aquaduct Durban Heights To High Wycombe Road | | | | Southern Aquaduct Durban Heights To High Wycombe Road | | | | Southern Aquaduct Durban Heights To High Wycombe Road | | | | | | | | | |
| REPORT # | EIL-398-03-01 | | | | EIL-398-03-01 | | | | EIL-398-03-01 | | | | | | | | | |
| SAMPLE # | 14253 | | | | 14247 | | | | 14251 | | | | | | | | | |
| POSITION: | (Amersham Road)TP 01 0.0km | | | | (Amersham Road)TP 04 0.8km | | | | (Aylesbury Road)TP 05 1.1km | | | | | | | | | |
| DEPTH: | 1.3-2.7 m | | | | 0.7-2.7 m | | | | 0.3-2.0 m | | | | | | | | | |
| DATE: | 14-Nov-23 | | | | 14-Nov-23 | | | | 23/14/11 | | | | | | | | | |
| Description of Material | Light grey silty clay(Amersham Road) | | | | Dark yellow clayey sand | | | | Dark brown silty sand | | | | | | | | | |
| SIEVE ANALYSIS | | | | | | | | | | | | | | | | | | |
| SIEVE SIZE (mm) | | | | | | | | | | | | | | | | | | |
| P A S S I N G | 100.0 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 75.0 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 63.0 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 50.0 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 37.5 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 28.0 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 20.0 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 14.0 | 100 | | | | 100 | | | | 100 | | | | | | | | |
| | 5.0 | 100 | | | | 97 | | | | 93 | | | | | | | | |
| | 2.0 | 99 | | | | 95 | | | | 85 | | | | | | | | |
| 0.425 | 78 | | | | 90 | | | | 57 | | | | | | | | | |
| 0.075 | 53 | | | | 60 | | | | 27 | | | | | | | | | |
| Grading Modulus (GM) | 0.69 | | | | 0.55 | | | | 1.31 | | | | | | | | | |
| SOIL MOTAR | | | | | | | | | | | | | | | | | | |
| 2.0 - 0.425 | 21 | | | | 6 | | | | 32 | | | | | | | | | |
| 0.425 - 0.250 | 16 | | | | 10 | | | | 15 | | | | | | | | | |
| 0.250 - 0.150 | 7 | | | | 10 | | | | 12 | | | | | | | | | |
| 0.150 - 0.075 | 3 | | | | 10 | | | | 9 | | | | | | | | | |
| < 0.075 | 26 | | | | 31 | | | | 36 | | | | | | | | | |
| ATTERBERG CONSTANTS | | | | | | | | | | | | | | | | | | |
| Plasticity Index (PI) | 18 | | | | 12 | | | | 9 | | | | | | | | | |
| Linear Shrinkage (LS) | 8.9 | | | | 5.9 | | | | 3.4 | | | | | | | | | |
| Liquid Limit (LL) | 55 | | | | 37 | | | | 37 | | | | | | | | | |
| AASHTO Soil Classification | A-5-7 | | | | A-5-6 | | | | A-2-4 | | | | | | | | | |
| TRH 14 Classification | - | | | | G10 | | | | G5 | | | | | | | | | |
| COTO Classification | | | | | | | | | | | | | | | | | | |
| MDD DATA | | | | | | | | | | | | | | | | | | |
|  | | | |  | | | |  | | | | | | | | | | |
| Wet Density (kg/m ³) | | | | | 2044 | 1952 | 2034 | 2036 | 1995 | | | | | | | | | |
| Dry Density(kg/m ³) | | | | | 1786 | 1766 | 1806 | 1791 | 1785 | | | | | | | | | |
| Moisture Content (%) | | | | | 14.5 | 10.6 | 12.6 | 13.6 | 11.8 | | | | | | | | | |
| MDD (kg/m ³) | OMC % | | | | 1806 | | OMC % | | 12.6 | | OMC% | | | | | | | |
| CBR DATA | | | | | | | | | | | | | | | | | | |
| Specimen | | | | | Specimen A | | Specimen B | | Specimen C | | | | | | | | | |
| Wet Density (kg/m ³) | | | | | 2029 | | 1922 | | 1830 | | | | | | | | | |
| Dry Density(kg/m ³) | | | | | 1797 | | 1709 | | 1624 | | | | | | | | | |
| Moisture Content (%) | | | | | 12.9 | | 12.5 | | 12.7 | | | | | | | | | |
| % Compaction Calculated | | | | | 99.5 | | 94.6 | | 89.9 | | | | | | | | | |
| CBR % | | | | | 2.3 | | 1.8 | | 1.1 | | | | | | | | | |
| % Swell Calculated | | | | | 5.49 | | 3.54 | | 2.14 | | | | | | | | | |
| Compaction % | 100 | 98 | 97 | 95 | 93 | 90 | 100 | 98 | 97 | 95 | 93 | 90 | 100 | 98 | 97 | 95 | 93 | 90 |
| CBR Values | | | | | 2 | 2 | 2 | 2 | 2 | 1 | | | | | | | | |
| Remarks: | | | | | | | | | | | | | | | | | | |



| | | | | |
|---|---|---|---|--|
|  | Earth Inv Lab FINAL REPORT (HYDROMETER ANALYSIS) | | | |
| | CLIENT: | MMK | MMK | MMK |
| | PROJECT: | Southern Aquaduct Durban Heights To High Wycombe Road | Southern Aquaduct Durban Heights To High Wycombe Road | Southern Aquaduct Durban Heights To High Wycombe Road |
| | REPORT # | EIL-398-03-01 | EIL-398-03-01 | EIL-398-03-01 |
| | SAMPLE # | 14253 | 14247 | 14251 |
| | POSITION: | (Amersham Road)TP 01 0.0km ■ | (Amersham Road)TP 04 0.8km ▲ | (Aylesbury Road)TP 05 1.1km ● |
| | DEPTH: | 1.3-2.7 m | 0.7-2.7 m | 0.3-2.0 m |
| | DATE: | 14-Nov-2023 | 14-Nov-2023 | 14-Nov-2023 |



| | | | | |
|--------------------------------|-------|--------------------------------------|-------------------------|-----------------------|
| Description of Material | | Light grey silty clay(Amersham Road) | Dark yellow clayey sand | Dark brown silty sand |
| HYDROMETER ANALYSIS | | | | |
| % Passing | 100.0 | 100 | 100 | 100 |
| | 75.0 | 100 | 100 | 100 |
| | 63.0 | 100 | 100 | 100 |
| | 50.0 | 100 | 100 | 100 |
| | 37.5 | 100 | 100 | 100 |
| | 28.0 | 100 | 100 | 100 |
| | 20.0 | 100 | 100 | 100 |
| | 14.0 | 100 | 100 | 100 |
| | 5.0 | 100 | 97 | 93 |
| | 2.0 | 99 | 95 | 85 |
| | 0.425 | 78 | 90 | 57 |
| | 0.075 | 53 | 60 | 27 |
| | 0.06 | 41 | 42 | 26 |
| | 0.02 | 38 | 40 | 22 |
| 0.006 | 31 | 32 | 18 | |
| 0.002 | 24 | 21 | 13 | |
| Course Sand 2.0-0.425 | 20.9 | 5.7 | 32.4 | |
| Fine Sand 0.425-0.05 | 79.1 | 55.6 | 43.2 | |
| Silt 0.05-0.005 | 0.0 | 7.5 | 4.1 | |
| Clay 0.005-0.002 | 0.0 | 11.3 | 6.1 | |
| Expansive Clay <0.002 | 0.0 | 19.8 | 14.2 | |
| Total % silt & clay in sample | 0.0 | 36.8 | 20.6 | |
| % Passing 0.075 mm in sample | 0.0 | 38.6 | 24.7 | |
| ACTIVITY CLASSIFICATION | | | | |
| Overall PI | 14.38 | 10.37 | 5.19 | |
| Activity Classification | | | | |





Earth Inv Lab FINAL REPORT (GRAD, ATT, MDD, CBR)

| | | | |
|------------------|---|---|--|
| CLIENT | MMK | MMK | |
| PROJECT: | Southern Aquaduct Durban Heights To High Wycombe Road | Southern Aquaduct Durban Heights To High Wycombe Road | |
| REPORT # | EIL-398-03-01 | EIL-398-03-01 | |
| SAMPLE # | 14242 | 14246 | |
| POSITION: | (Aylesbury Road)TP 06 1.4km | (ST Paul Road)TP 07 1.6km | |
| DEPTH: | 2.2-2.5 m | 1.2-2.4 m | |
| DATE: | 14-Nov-23 | 14-Nov-23 | |

| | | | |
|-------------------------|------------------------------|-------------------------|--|
| Description of Material | Yellowish brown sandy gravel | Dark yellow clayey sand | |
|-------------------------|------------------------------|-------------------------|--|

| SIEVE ANALYSIS | | | |
|--|-------|-----|-----|
| SIEVE SIZE (mm) | | | |
| % P A S S I N G | 100.0 | 100 | 100 |
| | 75.0 | 100 | 100 |
| | 63.0 | 100 | 100 |
| | 50.0 | 100 | 100 |
| | 37.5 | 100 | 100 |
| | 28.0 | 100 | 100 |
| | 20.0 | 100 | 100 |
| | 14.0 | 100 | 100 |
| | 5.0 | 97 | 89 |
| | 2.0 | 91 | 79 |
| | 0.425 | 32 | 64 |
| | 0.075 | 7 | 35 |

| | | | |
|----------------------|------|------|--|
| Grading Modulus (GM) | 1.71 | 1.21 | |
|----------------------|------|------|--|

| SOIL MOTAR | | | |
|---------------|----|----|--|
| 2.0 - 0.425 | 65 | 19 | |
| 0.425 - 0.250 | 17 | 11 | |
| 0.250 - 0.150 | 7 | 12 | |
| 0.150 - 0.075 | 4 | 12 | |
| < 0.075 | 27 | 37 | |

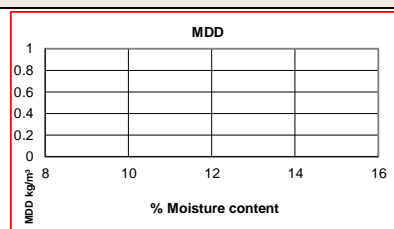
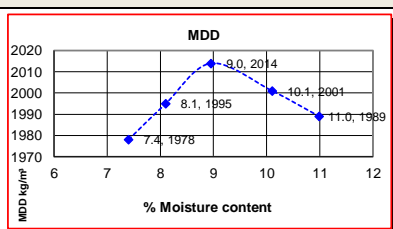
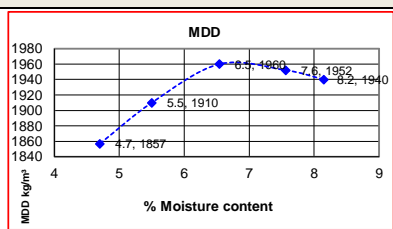
| ATTERBERG CONSTANTS | | | |
|-----------------------|-----|-----|--|
| Plasticity Index (PI) | NP | 5 | |
| Linear Shrinkage (LS) | 0.0 | 3.0 | |
| Liquid Limit (LL) | 0 | 33 | |

| | | | |
|----------------------------|-------|-----|--|
| AASHTO Soil Classification | A-2-4 | A-4 | |
|----------------------------|-------|-----|--|

| | | | |
|-----------------------|----|-----|--|
| TRH 14 Classification | G9 | G10 | |
|-----------------------|----|-----|--|

| | | | |
|---------------------|--|--|--|
| COTO Classification | | | |
|---------------------|--|--|--|

| MDD DATA | | | |
|----------|--|--|--|
|----------|--|--|--|

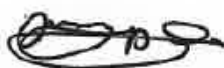



| | | | | | | | | | | | | | | | | | |
|----------------------------------|------|------|-------|------|------|-----|------|-------|------|------|------|--|------|--|--|--|--|
| Wet Density (kg/m ³) | 2088 | 2100 | 2106 | 2015 | 1945 | | 2194 | 2203 | 2156 | 2117 | 2208 | | | | | | |
| Dry Density(kg/m ³) | 1960 | 1952 | 1940 | 1910 | 1857 | | 2014 | 2001 | 1995 | 1978 | 1989 | | | | | | |
| Moisture Content (%) | 6.5 | 7.6 | 8.6 | 5.5 | 4.7 | | 9.0 | 10.1 | 8.1 | 7.0 | 11.0 | | | | | | |
| MDD (kg/m ³) | 1960 | | OMC % | | | 6.5 | 2014 | OMC % | | 9.0 | | | OMC% | | | | |

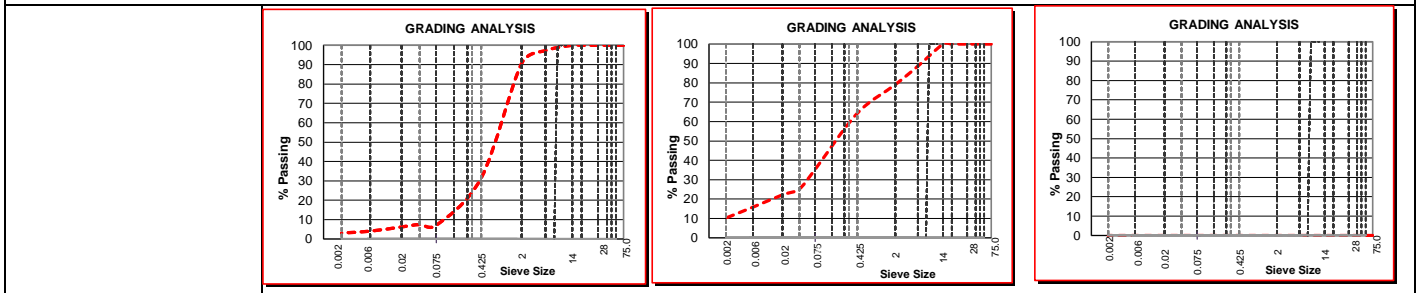
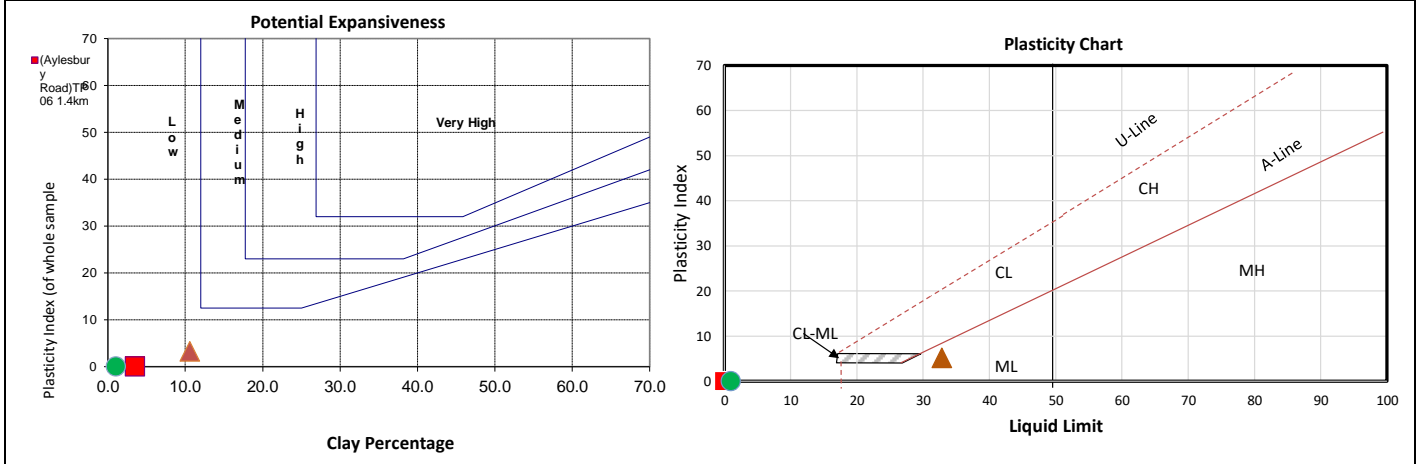
| CBR DATA | | | |
|----------|--|--|--|
|----------|--|--|--|

| Specimen | Specimen A | Specimen B | Specimen C | Specimen A | Specimen B | Specimen C | | | | | | | | | | | | |
|----------------------------------|------------|------------|------------|------------|------------|------------|-----|----|----|----|----|----|-----|----|----|----|----|----|
| Wet Density (kg/m ³) | 2097 | 1988 | 1893 | 2229 | 2109 | 2003 | | | | | | | | | | | | |
| Dry Density(kg/m ³) | 1965 | 1865 | 1771 | 2019 | 1914 | 1816 | | | | | | | | | | | | |
| Moisture Content (%) | 6.7 | 6.6 | 6.9 | 10.4 | 10.2 | 10.3 | | | | | | | | | | | | |
| % Compaction Calculated | 100.3 | 95.2 | 90.3 | 100.3 | 95 | 90.2 | | | | | | | | | | | | |
| CBR % | 50.3 | 22.8 | 5.9 | 8.6 | 3.2 | 1.7 | | | | | | | | | | | | |
| % Swell Calculated | 0.06 | 0.08 | 0.10 | 1.95 | 1.84 | 1.71 | | | | | | | | | | | | |
| Compaction % | 100 | 98 | 97 | 95 | 93 | 90 | 100 | 98 | 97 | 95 | 93 | 90 | 100 | 98 | 97 | 95 | 93 | 90 |
| CBR Values | 49 | 38 | 32 | 22 | 15 | 5 | 8 | 6 | 5 | 3 | 3 | 2 | | | | | | |

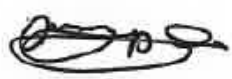
Remarks:




| | | | |
|---|---|--|--------------------------------------|
|  | Earth Inv Lab FINAL REPORT (HYDROMETER ANALYSIS) | | |
| | CLIENT: | MMK | MMK |
| PROJECT: | Southern Aquaduct Durban Heights To High Wycombe Road | Southern Aquaduct Durban Heights To High Wycombe Road | |
| REPORT # | EIL-398-03-01 | EIL-398-03-01 | |
| SAMPLE # | 14242 | 14246 | |
| POSITION: | (Aylesbury Road)TP 06 1.4km ■ | (ST Paul Road)TP 07 1.6km ▲ | ● |
| DEPTH: | 2.2-2.5 m | 1.2-2.4 m | |
| DATE: | 14-Nov-2023 | 14-Nov-2023 | |



| | | | |
|--------------------------------|-------|------------------------------|-------------------------|
| Description of Material | | Yellowish brown sandy gravel | Dark yellow clayey sand |
| HYDROMETER ANALYSIS | | | |
| % Passing | 100.0 | 100 | 100 |
| | 75.0 | 100 | 100 |
| | 63.0 | 100 | 100 |
| | 50.0 | 100 | 100 |
| | 37.5 | 100 | 100 |
| | 28.0 | 100 | 100 |
| | 20.0 | 100 | 100 |
| | 14.0 | 100 | 100 |
| | 5.0 | 97 | 89 |
| | 2.0 | 91 | 79 |
| | 0.425 | 32 | 64 |
| | 0.075 | 7 | 35 |
| | 0.06 | 7 | 25 |
| 0.02 | 6 | 22 | |
| 0.006 | 4 | 16 | |
| 0.002 | 3 | 10 | |
| Course Sand 2.0-0.425 | 65.2 | 18.7 | |
| Fine Sand 0.425-0.05 | 27.9 | 58.5 | |
| Silt 0.05-0.005 | 2.4 | 6.5 | |
| Clay 0.005-0.002 | 1.0 | 5.7 | |
| Expansive Clay <0.002 | 3.5 | 10.6 | |
| Total % silt & clay in sample | 6.3 | 18.0 | |
| % Passing 0.075 mm in sample | 7.6 | 20.6 | |
| ACTIVITY CLASSIFICATION | | | |
| Overall PI | NP | 3.31 | |
| Activity Classification | | | |



|  EARTHINVLAB | | Earth Inv Lab FINAL REPORT (pH & Conductivity) | | | |
|--|---|---|-------------------------|-----|------------------|
| CLIENT | MMK | | | | |
| PROJECT: | Southern Aquaduct Durban Heights To High Wycombe Road | | | | |
| REPORT # | EIL-398-03-01 | | | | |
| DATE: | 15-Nov-23 | | | | |
| Sample No. | Tp No. | Depth (m) | Description | pH | Conductivity S/m |
| 14253 | 1 | 1.3-2.7 | Light grey silty clay | 5.6 | 0.028 |
| 14247 | 4 | 0.7-2.7 | Dark yellow clayey sand | 6.2 | 0.037 |
| 14246 | 7 | 1.2-2.4 | Dark yellow clayey sand | 6.8 | 0.034 |
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| Remarks: | | | | | |
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