

**2018 MATERIALS LABORATORY TESTING SERVICES  
THE ROBERT B. BALTER COMPANY**

| Procedure   | AASHTO  | ASTM                                 | USACE                                  |
|---|---------|--------------------------------------|--|
| <b>LABORATORY QUALIFICATIONS</b>                        |         |                                      |  |
| LABORATORY EVALUATION STANDARD                          | R18     | E-329, D3666, D3740,<br>C1077, C1093 | ER 1110-1-261, E-<br>329, C1077, D3740 |
| <b>SAMPLE PREPARATION</b>                               |         |                                      |  |
| DRY SAMPLE PREPARATION                                  | T87     | D421                                 | D421                                   |
| SHELBY TUBE PREPARATION                                 |         |                                      |  |
| LABORATORY MANAGER (PER HOUR)                           |         |                                      |  |
| LABORATORY TECHNICIAN (PER HOUR)                        |         |                                      |  |
| <b>SOIL INDEX PROPERTIES</b>                            |         |                                      |  |
| WATER CONTENT   | T265    | D2216                                | D2216                                  |
| ATTERBERG LIMITS (Liquid and Plastic Limits)            | T89/T90 | D4318                                | D4318                                  |
| SHRINKAGE LIMIT (Mercury Method)                        | T92     | D427                                 | n/a                                    |
| SHRINKAGE LIMIT (Wax Method)                            | n/a     | D4943                                | n/a                                    |
| % PASSING NO. 200                                       | T11     | D1140                                | D1140                                  |
| % PASSING NO. 270 (USDA)                                | n/a     | n/a                                  | n/a                                    |
| % SOLIDS  | n/a     | n/a                                  | n/a                                    |
| SIEVE ANALYSIS  | T88     | D422                                 | D422                                   |
| SIEVE ANALYSIS AND HYDROMETER                           | T88     | D422                                 | D422                                   |
| HYDROMETER  | T88     | D422                                 | D422                                   |
| ORGANIC CONTENT   | T267    | D2974                                | n/a                                    |
| SPECIFIC GRAVITY  | T100    | D854                                 | n/a                                    |
| UNIT WEIGHT   | n/a     | n/a                                  | n/a                                    |
| POCKET PENETROMETER                                     | n/a     | n/a                                  | n/a                                    |
| SOIL CLASSIFICATION - USCS                              | n/a     | D2487                                | D2487                                  |
| SOIL CLASSIFICATION - Visual/Manual                     | n/a     | D2488                                | D2488                                  |
| SOIL CLASSIFICATION - For Highway Construction Purposes | M145-1  | D3282                                | n/a                                    |
| <b>SOIL COMPACTION AND STABILITY</b>                    |         |                                      |  |
| STANDARD PROCTOR  | T99     | D698                                 | D698                                   |
| STANDARD PROCTOR (One Point)                            | T99     | D698                                 | D698                                   |
| STANDARD PROCTOR w/ Cement                              | T134    | D558                                 | D558                                   |
| STANDARD PROCTOR w/ Lime                                | n/a     | n/a                                  | n/a                                    |
| MODIFIED PROCTOR  | T180    | D1557                                | D1557                                  |
| MODIFIED PROCTOR (One Point)                            | T180    | D1557                                | D1557                                  |
| MODIFIED PROCTOR w/ Cement                              | n/a     | D558                                 | n/a                                    |
| MODIFIED PROCTOR w/ Lime                                | n/a     | n/a                                  | n/a                                    |
| CBR (3 Point)   | T193    | D1883                                | D1883                                  |
| CBR w/ Cement (3 Point)                                 | T193    | D1883                                | D1883                                  |
| CBR w/Lime (3 Point)                                    | n/a     | n/a                                  | n/a                                    |
| CBR (One Point)   | T193-10 | D1883                                | D1883                                  |
| CBR w/ Cement (One Point)                               | T193-10 | D1883                                | D1883                                  |
| CBR w/Lime (One Point)                                  | n/a     | n/a                                  | n/a                                    |



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| <b>SOIL CORROSIVITY</b>   |        |       |       |
| pH  | T289   | G51   | n/a   |
| RESISTIVITY (1 point, as-received or saturated)   | T288   | G57   | n/a   |
| RESISTIVITY (2 points, as-received and saturated)   | T288   | G57   | n/a   |
| MINIMUM RESISTIVITY (multiple points)   | T288   | G57   | n/a   |
| CHLORIDES   | T291   | n/a   | n/a   |
| SULPHIDES   | n/a    | n/a   | n/a   |
| WATER SOLUABLE SULFATE ION  | T290   | C1580 | n/a   |
| <b>SOIL PERMEABILITY</b>  |        |       |       |
| PERMEABILITY - CONSTANT HEAD  | T215   | D2434 | n/a   |
| PERMEABILITY - FLEXIBLE WALL  | n/a    | D5084 | D5084 |
| REMOLDED PERMEABILITY- FLEXIBLE WALL  | n/a    | D5084 | D5084 |
| <b>SOIL STRENGTH AND COMPRESSIBILITY</b>  |        |       |       |
| CONSOLIDATION UP TO 32 tsf  | T216   | D2435 | D2435 |
| CONSOLIDATION UP TO 64 tsf  | T216   | D2435 | D2435 |
| CONSOLIDATION - Additional Cycle (Unload-Reload)  | T216   | D2435 | D2435 |
| ONE-DIMENSIONAL SWELL   | n/a    | D4546 | D4546 |
| UNCONFINED COMPRESSION  | T208   | D2166 | D2166 |
| UNCONFINED COMPRESSION TEST OF SOIL-LIME MIXTURE  | T220   | D5702 | n/a   |
| DIRECT SHEAR w/out Residual cycles greater than 0.01 in/min rate of Shearing Rate           | T236   | D3080 | D3080 |
| DIRECT SHEAR w/out Residual cycle slower than 0.01 in/min Shearing Rate (per point)         | T236   | D3080 | D3080 |
| DIRECT SHEAR w/ 5 Residual cycles greater than 0.01in/min Shearing Rate (per point)         | T236   | D3080 | D3080 |
| DIRECT SHEAR w/ 5 Residual cycles slower than 0.01in/min rate of Shearing (per point)       | T236   | D3080 | D3080 |
| DIRECT SHEAR - Remolded w/o Residual cycle greater than 0.01in/min Shearing Rate            | T236   | D3080 | D3080 |
| DIRECT SHEAR - Remolded w/o Residual cycle slower than 0.01in/min Shearing Rate (per point) | T236   | D3080 | D3080 |
| TRIAXIAL - UU (per point)   | T296   | D2850 | D2850 |
| TRIAXIAL - CU (per point)   | T297   | D4767 | D4767 |
| TRIAXIAL - CD (per point)   | T297   | D4767 | D4767 |
| TRIAXIAL TEST VARIATIONS (upon request)   | n/a    | n/a   | n/a   |
| <b>ROCK STRENGTH AND COMPRESSIBILITY</b>  |        |       |       |
| ROCK SPECIFIC GRAVITY   | n/a    |       | n/a   |
| UNCONFINED COMPRESSION w/out Stress-Strain  | n/a    | D2938 | n/a   |
| UNCONFINED COMPRESSION w/ Stress-Strain   | n/a    | D2938 | n/a   |
| INDIRECT (BRAZILIAN) TENSILE STRENGTH   | n/a    | D3967 | n/a   |
| CERCHAR ABRASIVITY  | n/a    | n/a   | n/a   |
| PUNCH PENETRATION   | n/a    | n/a   | n/a   |
| DIRECT SHEAR - Intact or Joint (single point, peak and residual)*                           | n/a    | D5607 | n/a   |
| DIRECT SHEAR - Intact or Joint (Per Sample up to 3 residual points)*                        | n/a    | D5607 | n/a   |
| TRIAXIAL COMPRESSIVE STRENGTH - peak load only*   | n/a    | D2664 | n/a   |
| TRIAXIAL COMPRESSIVE STRENGTH - stress-strain, Young Modulus, Poisson's Ratio*              | n/a    | D5407 | n/a   |
| DIRECT TENSILE STRENGTH   | n/a    | D2936 | n/a   |
| POINT LOAD TEST (per specimen)  | n/a    | D5731 | n/a   |
| MODULUS OF RUPTURE  | n/a    | C99   | n/a   |
| ROCK HARDNESS BY REBOUND HAMMER   | n/a    | D5873 | n/a   |



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|---|--------|--------------|------------|
| <b>AGGREGATE</b>  |        |              |            |
| REDUCING FIELD SAMPLES  | T248   | C702         | C702       |
| % PASSING NO. 200   | T11    | C117         | C117       |
| UNIT WEIGHT   | T19    | C29          | C29        |
| SIEVE ANALYSIS  | T27    | C136         | C136       |
| SPECIFIC GRAVITY OF COARSE AGGREGATE  | T85    | C127         | C127       |
| SPECIFIC GRAVITY OF FINE AGGREGATE  | T84    | C128         | C128       |
| WATER CONTENT   | T255   | C566         | C566       |
| LOS ANGELES ABRASION  | T96    | C131         | n/a        |
| FLATNESS AND ELONGATION   | n/a    | D4791        | n/a        |
| ORGANIC IMPURITIES IN FINE AGGREGATE  | T21    | C40          | C40        |
| <b>CONCRETE, MASONRY, MORTAR</b>  |        |              |            |
| COMPRESSIVE STRENGTH - CONCRETE CYLINDERS   | T23    | C39/C39M     | C39/C39M   |
| COMPRESSIVE STRENGTH OF CONCRETE CORES (2 Cuts and Capping)   | n/a    | C1542/C1542M | n/a        |
| GROUT CUBES (2X2X2)   | n/a    | C942         | n/a        |
| GROUT PRISM (3X3X6)   | n/a    | C1019        | C1019      |
| CONCRETE MASONRY PRISM  | n/a    | C1314        | n/a        |
| CONCRETE MASONRY PRISM (Special Loading Priced Individually)  | n/a    | C1314        | n/a        |
| CONCRETE MASONRY UNITS (CMU's) (per block unit cost including Compression & Absortion; multiple blocks needed for average unit) | n/a    | C140         | C140       |
| MORTAR CUBES  | n/a    | C109/C780    | n/a        |
| PETROGRAPHIC EXAMINATION  | n/a    | C295         | n/a        |
| SPLITTING TENSILE STRENGTH  | T198   | C496/C496M   | C496/C496M |
| FLEXURAL STRENGTH BEAMS - CENTER POINT  | T177   | C293         | n/a        |
| FLEXURAL STRENGTH FOR BEAM -THIRD POINT   | T97    | C78          | n/a        |
| CHLORIDE ION  | n/a    | C1152/C1152M | n/a        |
| COMPRESSIVE STRENGTH OF CYLINDERS   | T22    |              | n/a        |
| MOIST CABINETS, MOIST ROOMS, AND WATER STORAGE TANKS USED IN TESTING OF HYDRAULIC CEMENTS AND CONCRETES                         | n/a    | C511         | C511       |
| CAPPING CYLINDRICAL CONCRETE SPECIMENS  |        | C617         | C617       |
| STANDARD PRACTICE FOR USE OF UNBONDED CAPS IN DETERMINATION OF COMPRESSIVE STRENGTH OF HARDENED CONCRETE CYLINDERS              | n/a    | C1231        | C1231      |
| STANDARD TEST METHOD FOR PRECONSTRUCTION AND CONSTRUCTION EVALUATION OF MORTARS FOR PLAIN AND REINFORCED UNIT MASONRY           | n/a    | C780         | C780       |
| STANDARD PRACTICE FOR CAPPING CONCRETE MASONRY UNITS, RELATED UNITS AND MASONRY PRISIMS FOR COMPRESSION TESTING                 | n/a    | C1552        | C1552      |



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|---|--|--|-------|
| <b>FIREPROOFING</b>   |  |  |       |
| FIREPROOFING DENSITY  | n/a  | E605   | n/a   |
| <b>BITUMINOUS/HOT MIX ASPHALT</b>   |  |  |       |
| BULK SPECIFIC GRAVITY NON PARAFFIN COATED   | T166   | D2726  | D2726 |
| BULK SPECIFIC GRAVITY OF PARAFFIN SPECIMENS   | T275   | D1188  |       |
| THEORETICAL MAXIMUM SPECIFIC GRAVITY AND DENSITY OF BITUMINOUS PAVING MIXTURES  | T209   | D2041  | D2041 |
| PERCENT AIR VOIDS IN COMPACTED BITUMINOUS PAVING MATERIAL   | T269   | D3203  | D3203 |
| EXTRACTION/GRADATION (CORES)  | T319   | n/a  | n/a   |
| MARSHALL STABILITY and FLOW   | T245   | ASTM D   | n/a   |
| GYRATORY COMPACTION   |  |  |       |
| MARSHALL COMPACTION   | T312   | n/a  | n/a   |
| <b>SPECIAL TESTS PERFORMED WITH SPECIAL ARRANGEMENTS</b>  |  |  |       |
| Balter's AMRL R-18 Certified Laboratory review on AMRL R-18 Laboratories Website; Owings Mills, Maryland and Sterling, Virginia | Balter is a technical representative and voting member of ASTM E36 for Construction Inspection and Testing; NICET Construction Materials Development Committee; and Airports Consultants Council Engineering Committee for FAA Advisory Circulars Review |  |       |
| * Priced upon request   | **Included in Compressive Strength Testing Unit Price  | ***Priced upon requested loading slower than 0.01in/min. |       |

