



**USACE CERTIFICATE
OF
LABORATORY VALIDATION**



Bowser-Morner, Inc.

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Dayton, OH, United States
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has demonstrated, by abbreviated audit of its AASHTO accreditation, or by inspection of required records, equipment, procedures, facilities, and/or final reports, its proficiency to perform testing of construction materials, as established by the quality standards of AASHTO R 18 guidance and the requirements of the applicable ASTM standards.

**THIS USACE CERTIFICATE OF LABORATORY VALIDATION IS ACCURATE AS OF ITS DATE AND TIME OF
GENERATION:**

09 DEC 2021 AT 12:17 HOURS

ALL METHODS LISTED ON THIS CERTIFICATE OF VALIDATION WILL EXPIRE ON 12/08/2023

PLEASE CONFIRM THE CURRENT VALIDATION STATUS OF THIS LABORATORY USING THE SEARCH FEATURE ON
OUR PUBLIC WEBSITE: <https://mtc.erdcdren.mil>

A handwritten signature in black ink, appearing to read "Chad A. Gartrell", is written over a horizontal line.

Chad A. Gartrell, PE, Director
USACE Materials Testing Center
Vicksburg, Mississippi, USA

AGGREGATE

Aggregate - T 11 - Opt - AASHTO - No. 200 Wash Sieve for Mineral Aggregates
Aggregate - T 27 - Opt - AASHTO - Sieve Analysis of Aggregates
Aggregate - C 29 - Opt - Unit Weight and Voids in Aggregate
Aggregate - C 40 - Opt - Organic Impurities
Aggregate - D 75 - Opt - Sampling
Aggregate - T 84 - Opt - AASHTO - Specific Gravity and Absorption of Fine Agg
Aggregate - T 85 - Opt - AASHTO - Specific Gravity and Absorption of Course Agg
Aggregate - C 87 - Opt - Effects of Organic Impurities on Mortar Strength
Aggregate - C 88 - Opt - Sulfate Soundness
Aggregate - C 117 - Req - Material Finer than 75 µm (No. 200) Sieve
Aggregate - C 123 - Opt - Lightweight Particles
Aggregate - C 127 - Req - Specific Gravity & Absorption in Coarse Aggregate
Aggregate - C 128 - Req - Specific Gravity & Absorption in Fine Aggregate
Aggregate - CRD 130 - Opt - Scratch Hardness
Aggregate - C 131 - Opt - Los Angeles Abrasion Resistance on Small-Size Coarse Aggregate
Aggregate - C 136 - Req - Sieve Analysis of Aggregates
Aggregate - C 142 - Opt - Clay Lumps
Aggregate - T 210 - Opt - AASTO - Aggregate Durability Index
Aggregate - C 227 - Opt - Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar)
Aggregate - C 289 - Opt - Potential Alkali-Silica Reactivity of Aggregates (Chemical Method) (Withdrawn 2016)
Aggregate - C 295 - Opt - Petrographic Examination
Aggregate - E 329 - Opt - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
Aggregate - C 535 - Opt - Los Angeles Abrasion Resistance on Large Size Coarse Aggregate
Aggregate - D 546 - Opt - Sieve Analysis of Mineral Filler
Aggregate - C 566 - Opt - Total Moisture Content
Aggregate - C 586 - Opt - Alkali Reactivity of Carbonate Rocks (Rock Cylinder Method)
Aggregate - C 702 - Opt - Reducing Samples to Testing Size
Aggregate - C 1077 - Opt - Concrete and Concrete Aggregate Testing Standards (Quality Standards)
Aggregate - C 1105 - Opt - Length Change Due to Alkali-Carbonate Reaction
Aggregate - C 1252 - Opt - Uncompacted Void Content of Fine Aggregate (as influenced by particle shape, surface texture, and grading)
Aggregate - C 1260 - Opt - Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
Aggregate - C 1293 - Opt - Length Change Alkali-Silica Reaction
Aggregate - D 2419 - Opt - Sand Equivalent Value
Aggregate - D 3666 - Opt - Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
Aggregate - D 3744 - Opt - Aggregate Durability Index
Aggregate - D 4791 - Opt - Flat and Elongated Particles in Course Aggregate
Aggregate - D 5821 - Opt - Percentage of Fractured Particles in Coarse Aggregate
Aggregate - D 6928 - Opt - Resistance of Coarse Agg to Degradation by Abrasion in the Micro-Deval Apparatus
Aggregate - D 7428 - Opt - Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

BITUMINOUS

Bituminous - T 30 - Opt - AASHTO - Sieve Analysis of Extracted Aggregates
Bituminous - R 68 - Opt - AASHTO R68 - Preparation of Asphalt Mixes by Marshall Apparatus
Bituminous - T 166 - Opt - AASHTO - Bulk SG Using SSD (Cores)
Bituminous - T 245 - Opt - AASHTO - Marshall Stability and Flow
Bituminous - T 269 - Opt - AASHTO - Percent Air Voids
Bituminous - T 275 - Opt - AASHTO - Bulk SG of Asphalt Using Paraffin-Coated Cores
Bituminous - E 329 - Opt - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
Bituminous - D 1188 - Req - Bulk Specific Gravity & Density Using Coated Samples
Bituminous - D 2041 - Req - Theoretical Maximum Specific Gravity & Density (Rice)
Bituminous - D 2172 - Req - Quantitative Extraction
Bituminous - D 2726 - Req - Bulk Specific Gravity and Density
Bituminous - D 3203 - Req - Percent Air Voids
Bituminous - D 3549 - Opt - Thickness or Height of Compacted Asphalt Mixture Specimens
Bituminous - D 3666 - Opt - Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
Bituminous - D 5444 - Req - Mechanical Size Analysis of Extracted Aggregate
Bituminous - D 6926 - Req - Preparation of Bituminous Specimens using Marshall
Bituminous - D 6927 - Req - Marshall Stability and Flow of Bituminous Mixtures

CONCRETE

Concrete - C 31 - Req - Making and Curing Test Specimens in the Field
Concrete - C 39 - Req - Compressive Strength of Cylindrical Specimens
Concrete - C 42 - Opt - Drilled Cores and Sawed Beams
Concrete - C 78 - Opt - Flexural Strength by Third Point Loading
Concrete - C 138 - Req - Unit Weight and Air Content by Gravimetric
Concrete - C 143 - Req - Slump
Concrete - C 157 - Opt - Length Change of Concrete and Mortars
Concrete - C 172 - Req - Sampling
Concrete - C 173 - Req - Air Content by Volumetric ***required if C231 not performed***
Concrete - C 174 - Opt - Concrete Thickness by Drilled Cores
Concrete - C 192 - Opt - Making and Curing Test Specimens in Laboratory
Concrete - C 215 - Opt - Fundamental Frequencies of Concrete
Concrete - C 231 - Req - Air Content by Pressure ***required if C173 not performed***
Concrete - C 293 - Opt - Flexural Strength by Center Point Loading
Concrete - E 329 - Opt - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
Concrete - C 403 - Opt - Time of Setting by Penetration Resistance
Concrete - C 418 - Opt - Abrasion Resistance by Sand Blasting
Concrete - C 469 - Opt - Static Modulus of Elasticity and Poisson's Ratio
Concrete - C 496 - Opt - Splitting Tensile Strength
Concrete - C 511 - Opt - Moist Cabinets, Moist Rooms, Water Storage Tanks

Concrete - C 512 - Opt - Creep of Concrete in Compression
Concrete - C 617 - Opt - Capping Cylindrical Specimens
Concrete - C 642 - Opt - Density, Absorption, and Voids
Concrete - C 666 - Opt - Freezing & Thawing Concrete Specimens
Concrete - C 672 - Opt - Scaling Resistance by Deicing Chemicals
Concrete - C 803 - Opt - Penetration Resistance of Hardened Concrete
Concrete - C 805 - Opt - Rebound Number of Hardened Concrete
Concrete - C 1064 - Req - Temperature of Concrete
Concrete - C 1077 - Opt - Concrete and Concrete Aggregate Testing Standards (Quality Standards)
Concrete - C 1152 - Opt - Acid-Soluble Chloride in Concrete
Concrete - C 1218 - Opt - Water-Soluble Chloride in Concrete
Concrete - C 1231 - Opt - Unbonded Caps
Concrete - C 1542 - Opt - Measuring Length of Concrete Cores
Concrete - C 1567 - Opt - Potential Alkali Silica Reactivity Cementitious Materials and Aggregate Accelerated Mortar Bar Method

MASONRY

Masonry - C 67 - Opt - Sampling and Testing Brick and Structural Clay Tile
Masonry - C 109 - Req - Compressive Strength of Cement Mortars Using Cube Specimens
Masonry - C 140 - Req - Sampling and Testing Concrete Masonry and Related Units
Masonry - C 185 - Req - Air Content of Hydraulic Cement Mortar
Masonry - C 270 - Opt - Mortar for Unit Masonry
Masonry - C 305 - Req - Mechanical Mixing of Cement Pastes & Mortars of Plastic Consistency
Masonry - C 426 - Opt - Linear Drying Shrinkage of Concrete Masonry Units
Masonry - C 511 - Opt - Mixing Rooms, Moist Cabinets, Cure Tanks
Masonry - C 1019 - Req - Sampling and Testing Grout
Masonry - C 1093 - Opt - Masonry Testing Standard (Quality Standards)
Masonry - C 1314 - Opt - Compressive Strength of Masonry Prisms
Masonry - C 1437 - Opt - Flow of Hydraulic Cement Mortar
Masonry - C 1437 - Opt - Flow of Hydraulic Cement Mortar
Masonry - C 1506 - Opt - Water Retention of Hydraulic Cement-Based Mortars and Plasters
Masonry - C 1552 - Opt - Capping Concrete Masonry Units and Related for Compression Testing

ROCK

Rock - CRD 144 - Req - Resistance of Rock to Freezing and Thawing
Rock - CRD 169 - Req - Resistance of Rock to Wetting and Drying
Rock - D 3967 - Req - Tensile Strength, Splitting (Brazilian) Method
Rock - D 4543 - Req - Preparing Rock Core Specimens and Determining Tolerances
Rock - D 4644 - Req - Slake Durability of Shales and Weak Rocks
Rock - D 5240 - Opt - Evaluating Durability of Rock for Erosion Control Using Sodium Sulfate or Magnesium Sulfate

Rock - D 5312 - Req - Durability of Rock to Freezing and Thawing
Rock - D 5313 - Req - Durability of Rock to Wetting and Drying
Rock - D 5731 - Req - Point Load Index
Rock - D 6473 - Opt - Specific Gravity and Absorption of Rock for Erosion Control
Rock - D 7012 - Req - Compressive Strength & Elastic Moduli of Rock Core Specimens

SOILS

Soils - T 100 - Opt - AASHTO - Specific Gravity of Soils
Soils - G 187 - Opt - Measurement of Soil Resistivity Using the Two-Electrode Soil Box Method
Soils - D 421 - Req - Dry Preparation for Particle Size Distribution & Soil Constants
Soils - D 422 - Req - Particle Size Analysis
Soils - D 558 - Req - Moisture-Density of Soil-Cement
Soils - D 559 - Req - Wetting & Drying Soil-Cement
Soils - D 560 - Req - Freezing & Thawing Soil-Cement
Soils - D 698 - Req - Compaction Characteristics by Standard Effort
Soils - D 854 - Req - Specific Gravity of Soils
Soils - D 1140 - Req - Material Finer than 75 μ m (No. 200) Sieve
Soils - D 1557 - Req - Compaction Characteristics by Modified Effort
Soils - D 1633 - Opt - Compressive Strength of Molded Soil-Cement Cylinders
Soils - D 1883 - Req - CA Bearing Ratio (CBR)
Soils - D 2166 - Req - Unconfined Compressive Strength
Soils - D 2216 - Req - Water Content
Soils - D 2434 - Opt - Permeability of Granular Soils (Constant Head Method) (Withdrawn 2015)
Soils - D 2435 - Req - One-Dimensional Consolidation Properties
Soils - D 2487 - Req - Classification of Soils
Soils - D 2488 - Req - Description & Identification of Soils (Visual-Manual Procedure)
Soils - D 2850 - Req - Unconsolidated, Undrained Strength in Triaxial Compression
Soils - D 2974 - Req - Moisture, Ash, & Organic Matter of Peat & Other Organic Soils
Soils - D 3080 - Req - Direct Shear Test in Consolidated Drained Conditions
Soils - D 3740 - Opt - Soil and Rock Testing Standards (Quality Standard)
Soils - D 4318 - Req - Liquid & Plastic Limits & Plasticity Index
Soils - D 4546 - Req - One-Dimensional Swell or Settlement Potential
Soils - D 4647 - Opt - Identification and Classification of Dispersive Clay Soils by the Pinhole Test
Soils - D 4972 - Opt - pH of Soils
Soils - D 5084 - Req - Hydraulic Conductivity using a Flexible Wall Permeameter
Soils - D 6913 - Req - Particle-Size Distribution of Soils Using Sieve Analysis
Soils - D 6938 - Req - Density and Water Content by Shallow Depth Nuclear Method
Soils - D 7928 - Opt - Fine Grain Distribution with Hydrometer