

2501 – PART V

SECTION 2501

PART V

2501.1 GENERAL

In order to properly monitor materials on a project, follow all applicable procedures as outlined in the KDOT Construction Manual, Part V. This includes, but is not limited to, the sampling frequencies quantities and procedures; testing frequencies and procedures. Whenever a test procedure is required, use the Kansas Test (KT) procedures as outlined in Part V.

Copies of Part V can be obtained by contacting the Plans and Proposals Section in the Bureau of Construction and Materials, the local DME, or the Quality Assurance Section at MRC. **TABLE 2501-1** represents the current Part V revision dates applicable to the Contract.

TABLE 2501-1: PART V REVISION DATES		
SECTION	TITLE	REVISED
5.1	GENERAL	2014
5.1.1	Materials Control Functions of the Bureau of Construction and Materials	2014
5.2	QUALITY CONTROL/QUALITY ASSURANCE	2014
5.2.1	Statistics	2014
5.2.2	Rounding Off and Random Sampling	2014
5.2.2.1	Rounding-Off of Numbers	2012
5.2.2.2	Random Sampling	2014
5.2.3	Reasons for Quality Control/Quality Assurance (QC/QA) and the Certified Inspection and Testing Training Program (CIT ²)	2014
5.2.4	Procedures for Quality Assurance	2010
5.2.5	Quality Control/Quality Assurance (QC/QA) Tests	2014
5.2.6	Comparison of Quality Control and Verification Tests	2014
5.2.7	Contractor's Quality Control Plan	2014
5.2.7.1	HMA: Contractor's Quality Control Plan	2014
5.2.7.2	Guide for Quality Control and Acceptance Requirements for HMA	2010
5.2.7.3	Example of a Laboratory Quality Manual for HMA	2014
5.2.7.4	Concrete: Contractor's Quality Control Plan	2015
5.2.7.5	Example of a Laboratory Quality Manual for Concrete	2015
5.2.7.6	Concrete Structures: Contractor's Quality Control Plan	2014
5.2.7.7	Example of a Contractor's Concrete Structures Quality Control Plan for Controlling Evaporation	2010
5.2.7.8	Cement Treated Base: Contractor's Quality Control Plan (CTB)	2014
5.2.7.8.1	Example of a Laboratory Quality Manual for CTB	2014
5.3	MIX DESIGN METHODS	2010
5.3.1	Concrete Mix Design	2010
5.3.2	Bituminous Mix Design	2014
5.3.3	Superpave Mix Design	2010
5.3.4	Mix Design Procedures for CIR (Cold in Place Recycling) Material	2015
5.4	LABORATORY AND SAMPLE IDENTIFICATION	2014
5.4.1	Laboratory Identification	2014

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TABLE 2501-1: PART V REVISION DATES		
SECTION	TITLE	REVISED
5.4.2	Sample Identification	2014
5.4.3	Sample Identification Forms	2014
5.5	REQUIRED SAMPLE SIZES	2015
5.6	AGGREGATES	2014
5.6.1	General	2014
5.6.2	Types of Production	2014
5.6.3	Inspection Responsibilities	2014
5.6.4	Approval of Deposits	2014
5.6.5	Inspection, Sampling and Testing	2014
5.7	INSPECTION AND SAMPLING OF MATERIALS	2014
5.7.1	Asphalt Materials	2014
5.7.2	Brick and Concrete Masonry Units	2014
5.7.3	Concrete Curing Materials	2014
5.7.4	Joint Sealing and Joint Filler Material	2014
5.7.5	Miscellaneous Materials	2014
5.7.6	Miscellaneous Metals	2014
5.7.7	Bridge Paints and Pavement Marking Materials	2014
5.7.8	Culvert, Sewer, and Underdrain Pipe	2014
5.7.9	Cementitious Material	2014
5.7.10	Materials for Roadside Improvement	2014
5.7.11	Steel and Iron	2014
5.7.12	Timber, Lumber, Piling, and Posts	2014
5.7.13	Water for Use with Portland Cement	2014
5.8	NUCLEAR GAUGE	2014
5.8.1	1.13.2 SOM – RADIOLOGICAL SAFETY GUIDELINES	2014
5.8.2	Independent Assurance Replicate (ASR) Check for Nuclear Gauges	2010
5.8.3	Segregation Check Using the Nuclear Density Gauge	2014
5.8.4	Joint Density Evaluation Using the Nuclear Gauge	2014
5.9	SAMPLING AND TEST METHODS FOREWARD	2014
5.9.1 KT-1	Sampling and Splitting of Aggregates	2014
5.9.2 KT-2	Sieve Analysis of Aggregates	2015
5.9.3 KT-3	Material Passing No. 200 (75 µm) Sieve by the Wash Method	2014
5.9.4 KT-4	Percent Retained on the No. 200 (75 µm) Sieve by Dry Screening	2014
5.9.5 KT-5	Unit Weight of Aggregate	2014
5.9.6 KT-6	Specific Gravity and Absorption of Aggregates	2015
5.9.7 KT-7	Clay Lumps and Friable Particles in Aggregate	2014
5.9.8 KT-8	Shale or “Shalelike” Materials in Aggregate	2014
5.9.10 KT-10	Plasticity Test	2014
5.9.11 KT-11	Moisture Tests	2014

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TABLE 2501-1: PART V REVISION DATES		
SECTION	TITLE	REVISED
5.9.12 KT-12	Standard Compaction Test	2014
5.9.13 KT-13	Field Density Tests of Soils, Treated Base Courses, and Water Bound Base Courses	2015
5.9.14 KT-14	Marshall Test of Bituminous Mixes	2015
5.9.15 KT-15	Bulk Specific Gravity and Unit Weight of Compacted Asphalt Mixtures	2014
5.9.16 KT-16	Deleted	2010
5.9.17 KT-17	Sampling Freshly Mixed Concrete	2012
5.9.18 KT-18	Air Content of Freshly Mixed Concrete by the Pressure Method	2015
5.9.19 KT-19	Air Content of Freshly Mixed Concrete by the Volumetric Method	2014
5.9.20 KT-20	Mass per Cubic Foot (Meter), Yield Cement Factor and Air Content (Gravimetric) of Freshly Mixed Concrete	2014
5.9.21 KT-21	Slump of Portland Cement Concrete	2012
5.9.22 KT-22	Making and Curing Compression and Flexural Test Specimens in the Field	2014
5.9.23 KT-23	Flexural Strength of Concrete (Third – Point Loading Method)	2015
5.9.24 KT-24	Determination of Free Moisture or Absorption of Aggregate for Use in Concrete	2014
5.9.25 KT-25	Sampling and Splitting Plant Mixed Asphalt Mixtures	2015
5.9.26 KT-26	Sampling Asphalt Materials	2012
5.9.27 KT-27	Sampling Joint Compound Materials	2014
5.9.28 KT-28	Sampling Bridge Paint	2012
5.9.29 KT-29	Field Sampling of Portland Cement, Lime and Fly Ash	2012
5.9.30 KT-30	Field Sampling of Thermoplastic Pavement Marking Material	2010
5.9.31 KT-31	Determination of Percentage of Crushed Particles in Crushed Gravel	2014
5.9.32 KT-32	Method of Test for Density of Compacted Asphalt Mixtures by Nuclear Method	2014
5.9.33 KT-33	Deleted See KTMR-39	2010
5.9.34 KT-34	Sieve Analysis of Extracted Aggregate	2014
5.9.35 KT-35	Sticks in Aggregate	2014
5.9.36 KT-36	Density of Freshly Mixed Concrete in Bridge Deck Overlays by Nuclear Gauge	2014
5.9.37 KT-37	Making, Curing, and Testing Cement Treated and Unbound Bases in the Laboratory	2014
5.9.38 KT-38	Density of Freshly Mixed Concrete in Pavement by Nuclear Gauge	2014
5.9.39 KT-39	Theoretical Maximum Specific Gravity of Asphalt Paving Mixtures	2014
5.9.41 KT-41	Determination of Density and Moisture Content of Portland Cement Treated Bases Aggregate Bases and Aggregate Shoulders by Nuclear Method	2014
5.9.42 KT-42	Sieve Analysis for Acceptance of Lime or Cement Treated Soils	2014
5.9.43 KT-43	Moisture Content of Asphalt Mixtures or Mineral Aggregates – Microwave Oven Method	2014
5.9.44 KT-44	Method of Testing the Strength of Portland Cement Concrete Using the Maturity Method	2014
5.9.45 KT-45	Determination of Dry Paint Film Thickness with the Magnetic Gauge	2010
5.9.46 KT-46	Determination of Pavement Profile with the Profilograph	2014
5.9.47 KT-47	Depth Determination of Hot – in – Place Recycled Asphalt Pavement (HIPR)	2014
5.9.49 KT-49	Method for Obtaining and Testing Drilled Cores from PCCP and Precast Girders	2015

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TABLE 2501-1: PART V REVISION DATES		
SECTION	TITLE	REVISED
5.9.50 KT-50	Uncompacted Void Content of Fine Aggregate	2014
5.9.51 KT-51	Field Density and Moisture Tests of Soils by Nuclear Gauge	2015
5.9.54 KT-54	Deleted See KT-46	2010
5.9.55 KT-55	Plastic Fines in Combined Aggregates by use of the Sand Equivalent Test	2015
5.9.56 KT-56	Resistance of Compacted Asphalt Mixture to Moisture Induced Damage	2015
5.9.57 KT-57	Determination of Asphalt Content and Gradation of Hot Mix Asphalt Concrete by the Ignition Method	2014
5.9.58 KT-58	Method for Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyrotory Compactor	2014
5.9.59 KT-59	Flat and Elongated Particles in Coarse Materials Test	2014
5.9.60 KT-60	Indirect Tensile Test	2014
5.9.61 KT-61	Raveling Test on Recycled Asphalt Specimens	2010
5.9.62 KT-62	Percent Solids of Lime Slurry	2012
5.9.63 KT-63	Method for Determining Draindown Characteristics in Uncompacted Asphalt Mixtures	2014
5.9.64 KT-64	Method for Determining Volume of Voids in Compacted Filler or Fines	2014
5.9.65 KT-65	Sampling and Splitting Cement Treated Base Mixtures	2014
5.9.66 KT-66	Sampling Epoxy Pavement Marking	2010
5.9.67 KT-67	Sampling Glass Beads	2010
5.9.68 KT-68	Sampling Traffic Paint	2010
5.9.69 KT-69	Relative Density	2015
5.9.70 KT-70	Method for Testing Polymer Overlays for Surface Preparation and Adhesion	2014
5.9.71 KT-71	Air –Void Analyzer	2014
5.9.72 KT-72	Measuring Flowing Concrete	2014
5.9.73 KT-73	Density, Absorption and Voids in Hardened Concrete	2015
5.9.76 KT-76	Method for Testing the Compressive Strength of Molded Cylindrical Concrete Specimens	2014
5.9.77 KT-77	Method for Capping Cylindrical Concrete Specimens	2014
5.9.78 KT-78	Method for Determining the Tensile Adhesive Strength of Asphalt Pavement Tack Coat	2014
5.9.79 KT-79	Surface Resistivity of Concrete	2015
5.9.80 KT-80	Uncompacted Void Content of Coarse Aggregate	2014
5.9.81 KT-81	Sampling Cold Plastic Pavement Marking, Patterned Cold Plastic Pavement Marking Tape and High Durability Pavement Marking Tape	2015
5.9.82 KT-82	Determination of Excessive Moisture in Concrete Surfaces	2015
5.9.83 KT-83	Strand Bond in Prestressed Concrete Members	2015
5.10	CALCULATIONS	2010
5.10.1	Absolute Volume and Percent of Voids in a Unit Volume of Aggregate	2010
5.10.2	Theoretical Specific Gravity of a Combination of Aggregates	2010
5.10.3	Volume of Asphalt Materials	2012
5.10.4	Calculations for the Marshall Mix Design of Bituminous Mixtures	2012
5.10.5	Fineness Modulus of Aggregates (Gradation Factor)	2012

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TABLE 2501-1: PART V REVISION DATES		
SECTION	TITLE	REVISED
	APPENDICES	
Appendix A	Sampling and Testing Frequency Chart – Non Quality Control/Quality Assurance Specifications	2015
Appendix B	Sampling and Testing Frequency Chart – Quality Control/Quality Assurance Specifications	2015
Appendix C	Test Procedure Criteria for the Independent Assurance Program	2014
Appendix D	Policy and Procedure Manual for the Inspection of Kansas Department of Transportation District Laboratories	2014

2501.2 KANSAS TEST, MATERIALS AND RESEARCH (KTMR) TEST METHODS

KTMR tests are procedures found at MRC and are not expected to be performed in the field. Copies can be obtained by contacting the Quality Assurance Section at MRC if required within a specification.

TABLE 2501-2: KTMR TEST METHODS	
TITLE	TEST NUMBER
Determination of Polymer Additive Percentages in Polymer Modified Asphalt Cements	KTMR-2
Permeability for Base Course Material	KTMR-5
Determination of Alkyd Base in Thermoplastic Material	KTMR-6
Roundness of Glass Beads for Traffic Markings	KTMR-7
Moisture Resistance of Glass Beads for Traffic Markings	KTMR-8
Field Evaluation of Pavement Marking Materials	KTMR-9
Removability of Temporary Pavement Marking Tape	KTMR-10
Rotational Capacity Testing of High Strength Fasteners - FHWA Supplemental Specification	KTMR-11
Dry to No-Pick-Up Time for Water-Borne Traffic Paint	KTMR-12
Method of Test for Determination of Volume Change of Soils	KTMR-14
Determining if Fly Ash is Present in Plastic Portland Cement Concrete or Portland Cement	KTMR-15
Testing of Dowel Bars Placed in Concrete for Resistance to Removal (Pull Out)	KTMR-16
Recovery of Asphalt from Solution by Abson Method	KTMR-18
Method of Testing Release Compounds for Asphalt Mixes	KTMR-19
Chemical Analysis of Asphalt Rejuvenating Agents	KTMR-20
Soundness and Modified Soundness of Aggregates by Freezing and Thawing	KTMR-21
Durable Aggregate Test	KTMR-22
Wetting and Drying Test of Sand-Gravel Aggregate for Concrete	KTMR-23
Procedures for Testing Lightweight Aggregates	KTMR-24
Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inches or [50 mm] Cube Specimens)	KTMR-26
Modified Specific Gravity and Absorption of Aggregate	KTMR-27
Determination of Total Acid Insoluble Residue	KTMR-28
Wetting and Drying Test of Steam Cured Reinforced Concrete Pipe with Fly Ash	KTMR-29
Preparation of Bridge Coating Test Panels for Cyclic Corrosion/UV Exposure	KTMR-30
Solvent Test for Artificial Wood	KTMR-31
Particle Size Analysis	KTMR-32

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TABLE 2501-2: KTMR TEST METHODS	
TITLE	TEST NUMBER
Durable Aggregate Test	KTMR-33
Determining Dynamic Modulus of Hot-Mix Asphalt Concrete and Cold-in-Place Recycle Mixtures	KTMR-34
Strand Bond in Prestressed Concrete Members	KTMR-36
See KT-61	KTMR-38
Bitumen Content of Paving Mixtures By Reflux Extraction	KTMR-39
See KT-69	KTMR-40

2501.3 AASHTO TEST METHODS

In addition to the test methods referenced above, the following American Association of State Highway and Transportation Officials (AASHTO) test methods are used as written in the current edition of the AASHTO Materials Manual, Part II. Copies can be obtained from AASHTO, or can be viewed at the offices of the local DME, Construction and Materials Headquarters, or the Quality Control Section in MRC.

TABLE 2501-3: AASHTO TEST METHODS	
TITLE	AASHTO TEST METHOD
Organic Impurities in Fine Aggregates for Concrete	AASHTO T 21
Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine	AASHTO T 96
Lightweight Pieces in Aggregate	AASHTO T 113