

NDDOT FIELD SAMPLING AND TESTING MANUAL

CHANGES TO MANUAL SINCE 8/2007

Section Name	Description	Date Revised	Web Date
2016 Changes			
Section 100 • 106	Revised Section 106. Clarified what Independent Assurance (IA) is and we are responsible for local roads on NHS projects.	6/1/2016	6/6/2016
Section 200 • 203, 210	Sections 203 and 210 have been revised. Old versions are to be discarded and replaced.	6/1/2016	6/6/2016
Section 400 • 401, 411 • 420, 421, 422	With the exception of Section 430 that was added in 2015, the 400 section has been totally replaced with Section 401, 411, 420, 421, 422. Forms also have been updated with new versions where necessary. Except for section 430, the old 400 section including appendices are to be discarded and replaced.	6/1/2016	6/6/2016
Section 500 • 550	Section 550 is new and is the only section that is under the 500 section at this time. Discard and replace the old Section 500.	6/1/2016	6/6/2016
Test Procedures • ND T 176	Procedural revisions have been made to ND T 176 for the sand equivalent test. Discard and replace old version.	5/1/2016	6/6/2016
Section Forms	Forms referenced in the back of each section in which they are used are for reference only. As forms are revised they are placed on the NDDOT internet website under the "FORMS" heading and these are the ones to be used when working projects. The forms in the manual may not be updated with every new revision. Use the current form and discard all old paper versions when a form is revised.		
Forms • SFN 2454, • SFN 59725	SFN 2454 "Density Test Worksheet - Volume Measure", and SFN 59725 "Density Test Worksheet - Sand Cone Method," have been revised to document the lot numbers.	5/2016	5/2016

Section Name	Description	Date Revised	Web Date
2015 Changes			
Section 400 <ul style="list-style-type: none"> Section 430 has been added 	Section 430, "Hot Mix Asphalt (HMA) Testing and Sampling Requirements," has been added to Section 400. Section 430 is to be used with 2015 projects. This section replaces 402, 403, 407, 408, 409, 410, and the appendices in Section 400. The old sections will remain in the Field Sampling and Testing Manual until all 2014 construction projects are completed.	5/22/2015	5/27/2015
Testing Procedures Section	"Testing Procedures" chapter - Replaced in its entirety. All NDDOT procedures that are modified from AASHTO or ASTM methods, are re-identified as an ND instead of as AASHTO or ASTM (e.g., ND T 2). In addition, procedure "ND T 113" had errors in two formulas under 'Calculations'. The formulas were corrected to be divided by 100.	2/13/2015	2/20/2015
2014 Changes			
Section 700 <ul style="list-style-type: none"> 709 Table of Contents 	709 'Geotextile Materials' - Changed in its entirety.	6/26/2014	6/27/2014
Section 700 <ul style="list-style-type: none"> 714 Table of Contents 	714 'Culverts, Storm Drains, Edge Drains, and Underdrains' - Changed in its entirety. Added edge drains to the section. Added acceptance samples and tests for metallic culverts, concrete pipe, plastic pipe, underdrain granular fill materials. Added acceptance samples and tests for compaction control for pipe backfill. Added independent assurance samples and tests compaction control for pipe backfill. Added independent assurance samples and tests for underdrain.	3/19/2014	3/20/2014
Section 200 <ul style="list-style-type: none"> 210 	Revisions made to 210.1 Acceptance Samples and Tests and 210.2 Independent Assurance Samples and Tests. Replaced SFN 13889 & DOT 13942 with updated versions in Section 200.	3/19/2014	3/20/2014

Section Name	Description	Date Revised	Web Date
2013 Changes			
400 Section • 410	On page 3 in the 2 nd last paragraph, added all AASHTO testing specifications needed to be referenced after obtaining an aggregate sample, to be consistent within all of Section 410. On page 6, the very last sentence was changed to reference “table on page 7” instead of saying “table below.”	1/8/2013	1/14/2013
2012 Changes			
Testing Procedures • AASHTO T 2	Page 3 under “Sampling from a Windrow”, the first sentence was deleted. On page 4 in the 1 st paragraph, the 1 st word of 2 nd sentence-the word “shove” was replaced with “insert”. Also page 4 under “Sampling from a Truck,” the 2 nd paragraph was rewritten for clarification.	12/26/2012	1/14/2013
Testing Procedures • AASHTO T 166	Page 1 under “Referenced Documents” we added AASHTO T 331. Under “Apparatus” added words “with overflow outlet” behind Water bath. Under “Procedure”, page 1, removed the 2 nd sentence in the 2 nd paragraph. Under “Calculations” in the very last sentence added reference to AASHTO T 331, and under “Notes” added 1 st sentence.	12/26/2012	1/14/2013
Testing Procedures • AASHTO T 209	Corrected title to be same as current AASHTO Standard Spec book. Under “Apparatus” corrected measurement by Vacuum gage and pump to (4 kPa); and changed written order of the Volumetric flasks item. Under Procedures on page 2, paragraph 8 corrected measurement to read (4 kPa). Page 3 in 1 st paragraph added a) sign that was missing from (8 kPa).	12/26/2012	1/14/2013
Testing Procedures • AASHTO T 304	Page 1, under “Apparatus” behind Metal spatula added “with straight edge”. Page 2, under “Test Specimen” rewrote the 4 th paragraph beginning with word “Remove” and corrected the table below it to reflect the changes of the paragraph. Under “Procedure” on page 2 in last paragraph, added word “rapid” before “single pass”, and added 2 nd sentence of same paragraph starting with “The blade.....”	12/28/2012	1/14/2013
Testing Procedures • AASHTO T 312	Page 2 identified the “Mixture Preparation” and the “Compaction Procedure”. Added temperature ranges of the oven within each of these 2 sections for °F and °C.	12/26/2012	1/14/2013

Section Name	Description	Date Revised	Web Date
Testing Procedures • NDDOT 5	Page 1 under “Referenced Documents” removed the two words “paving mixtures” at end of AASHTO T 209 and corrected typing error in T 312. Under “Procedure” in the 1 st paragraph the weights were changed. In the 2 nd sentence of same paragraph words “Marshall” and “only” were added.	12/26/2012	1/14/2013
Appendix 400-A-2-C	Added clarification to No. 7 about the QC acceptance sample	7/26/2012	7/26/2012
Appendix 400-A-2-A	Corrected an error in the description of the revision. Changed 1 st sentence to read 2 nd sentence.	6/2012	6/2012
Table of Revisions	A table of revisions has been added to the web manual. This table details all changes that have taken place within the manual since updated sections have been placed on the web in August, 2007.	5/2012	5/2012
Section 100, 500, 600, 700, 800, Frequency Table	No revisions made. Added to the web as is. These old sections of FS&TM are in the process of being revised. Newest versions of these sections will be placed on web after approved by the FHWA.	5/2012	5/2012
Section 200 • Table of Contents	Updated the table of contents of the 200 Section to reflect that changes were made in SFN 2454 and 59725.	3/6/2012	3/6/2012
• Forms in Sec. 200	Updated two forms at the end of the 200 Section. SFN 2454 – enlarged columns for fill-in. SFN 59725 corrected formula in m. Moisture loss = $k - l$ (replaced the i with an l).	3/6/2012	3/6/2012
Section 400 • Appendix 400-C4	Page 2, under 400-C-4-1, corrected the 23.36 mm to 2.36 mm. Also had to add “400-C-4 Fine Aggregate Test Modifications” to page 2 of the table of contents.	3/1/2012	3/5/2012
Section 200	Replaced text portion of 200 Section and added 2 forms. Added reference to AASHTO T 191 procedure to all sections where needed. Added reference to AASHTO T 99 and T 180 to all sections where they were missing. Added two forms to the end of the section: SFN59724 and SFN 59725 regarding sand cone correction factor and density test worksheet. Made reference to these forms throughout Section 200.	1/24/2012	1/27/2012

Section Name	Description	Date Revised	Web Date
AASHTO T 99/T 180	Replaced all of T 99/T 180. Removed the written AASHTO T 265 procedure on page 5 but kept reference to it. T 265 already exists under the procedure section. Size reduced to 8 pages. Revised the "Method D" table (pg. 2) by changing the 'soil passing sieve' from No. 4 to 3/4".	1/12/2012	1/17/2012
AASHTO T 265	Replaced both pages of T 265. Revised formula under "Calculations" according to the "AASHTO Standard Specifications of Transportation Materials & Methods of Sampling and Testing" (pg. 2).	1/12/2012	1/17/2012
ASTM D 4643	Replaced both pages of D 4643. Revised formula under "Calculations" according to "AASHTO Standard Specs of Transportation Materials & Methods of Sampling and Testing" (pg. 2).	1/12/2012	1/17/2012
Memorandums	Added M&R Memo 1-1999 "PG Asphalt Sampling and Testing on Federal Aid County Projects," and M&R Memo 2-2009 "Rapid and Quick Set Emulsion Testing." Revised and replaced the Memorandums "Table of Contents."	1/3/2012	1/6/2012
2011 Changes			
Section 400	Replaced complete 400 Section. Revised the reference to the ASTM D 244 procedure to the T 59 procedure (ASTM D 244 was discontinued); SFN 19802 was deleted and any reference to it was changed with SFN 59132; replaced forms to the current version.	6/22/2011	8/5/2011
• Appendix 400-A-1C	Added reference to "contract documents" (pg. 1).	6/22/2011	8/5/2011
• Appendix 400-A-2A	Added "contract documents" to end of 2 nd sentence (pg. 1); Added 3 rd paragraph on splitting QC samples (pg. 2); Added last 2 sentences to last paragraph: "If the QC and Verification test results do not agree....."(pg. 2)	6/22/2011	8/5/2011
• Appendix 400-A-2B	Added reference to "contract documents" (pg. 2); Added item No. 5 about QC split samples (pg. 3)	6/22/2011	8/5/2011
• Appendix 400-A-2C	Add item No. 7 about Contractor IA run tests (pg. 4).	6/22/2011	8/5/2011

Section Name	Description	Date Revised	Web Date
• Appendix 400-A-3	Added last paragraph in table under the “Verification Testing” regarding split QC sample (pg. 6).	6/22/2011	8/5/2011
• Appendix 400-D	Added appendix to manual	6/17/2011	8/5/2011
• Appendix 400-E	Added appendix to manual	8/1/2011	8/5/2011
AASHTO T 99/T 180 Test Procedure	Revised/added paragraph 3, 4, 5 (pg. 1); the Method D table (pg. 2); the Method A & Method D under “Sample Size” (pg. 2); added 2 statements referencing method D with * and ** (pg. 3).	6/17/2011	8/5/2011
AASHTO T 191 Test Procedure	Added sand cone form numbers SFN 59725 and SFN 59724 as a reference in 1 st paragraph under “Procedure” (pg. 3)	6/17/2011	8/2011
AASHTO T 224 Test Procedure	Corrected formulas (pg. 2)	6/16/2011	8/2011
AASHTO T 245 Test Procedure	Corrected table on pg. 4 “Correction Factor Table”	6/22/2011	8/2011
2010 Changes			
AASHTO T 84	Removed 3 rd paragraph on pg. 1	2/10/2010	2/2010
AASHTO T 113		2/10/2010	2/2010
Memorandums	Added Memo 1-2010 “Use of Nuclear Gauges on Soils or Aggregates”	5/20/2010	8/2010
Appendix 400-B	Corrected air voids % on pg. 3	11/15/2010	11/2010
2009 Changes			
Memorandums	Added M&R Memo 1-2009 “Sampling Soils or Soil Aggregates for Pipe Backfill Acceptance	7/29/2009	8/2009
Section 210.1	Modified compaction control of pipe in 1 st paragraph under “Field Lab Testing Compaction” (pg. 1)	6/16/2009	8/2009
Section 302.1, pg. 2	Added last 2 sentences at end of 1 st paragraph on sampling frequency of failing samples	7/23/2009	8/2009
Section 306.1 pg. 1	Added last 2 sentences of 4 th paragraph for lot acceptance testing	7/23/2009	8/2009
Section 300 Forms	Added forms at section end: 10072, 13889,14388	7/23/2009	8/2009
AASHTO T 84	Added 3 rd paragraph on pg. 1	1/30/2009	3/2009
AASHTO T 191	Added procedure to manual	5/28/2009	8/2009

Section Name	Description	Date Revised	Web Date
AASHTO T 224	Added procedure to manual	7/1/2009	8/2009
2008 Changes			
Section 230.1	Added last paragraph on embankment widening	3/12/2008	8/2008
Section 230.2	Added last sentence of 1 st paragraph on test frequency for embankment widening	3/12/2008	8/2008
Memorandums	Added Memo 1-2008 physical property testing of aggregate	8/1/2008	8/2008
2007			
Disclaimer	Added – new original		8/2007
Section 200	Added – new original		8/2007
Section 300	Added – new original		8/2007
Section 400	Added – new original		8/2007
Testing Procedures	Added – new original		8/2007
Rounding Procedures	Added – new original		8/2007
Random Sampling	Added – new original		8/2007
M&R Memorandums	Added – new original		8/2007
QA Program of Concrete Products	Added – new original		8/2007