

SUBCOMMITTEE ON MATERIALS

2017 Annual Meeting – Phoenix, AZ

Wednesday August 9th, 2017

3:15 – 5:00 PM EST

TECHNICAL SECTION 2d

Proportioning of Asphalt - Aggregate Mixtures

I. Call to Order and Opening Remarks

We need a Research Liaison!!!

II. Roll Call

First Name	Last Name	State	Designation
Ross	Metcalfe	MT	Chair
Greg	Milburn	WY	Vice Chair
Barry	Paye	WI	Member
Brett	Trautman	MO	Member
Brian	Pfeifer	IL	Member
Christopher	Leibroek	KS	Member
Darren	Hazlett	TX	Member
Denis	Boisvert	NH	Member
Eric	Biedl	OH	Member
Robert	Lauzon	CT	Member
Scott	Seiter	OK	Member
Sejal	Barot	MD	Member
Mladen	Gagulic	VT	Member
Darin	Tedford	NV	Member
Eric	Shishido	HI	Member
Brian	Egan	TN	Member
Allen	Myers	KY	Member
Joe	Feller	SD	Member

John	Grieco	MA	Member
Michael	San Angelo, P.E.	AK	Member
Michael	Benson	AR	Member
Michael	Santi	ID	Member
Ron	Horner	ND	Member
Wasi	Khan	DC	Member
Kurt	Williams	WA	Member
Lyndia	Blackburn	AL	Member
Paul	Burch	AZ	Member
Bill	Schiebel	CO	Member
Timothy	Ruelke	FL	Member
Jennifer	Pinkerton	DE	Member
Scott	Andrus	UT	Member
Richard	Bradbury	ME	Member
Curt	Turgeon	MN	Member
Timothy	Ramirez	PA	Member
Michael	Byrne	RI	Member
Sean	Parker	OR	Member
Becca	Lane	ON	Associate

III. Approval of Technical Section Minutes

See attachments A1 and A2. The last meeting of the TS was a conference call on June 6th, 2017. Minutes for the midyear webinar on January 31st, 2017 were not approved at that time. Seek motion to approve both sets of minutes.

IV. Old Business

A. No outstanding SOM ballot items.

- i. Some comments from reconfirmation ballot regarding alternate materials used as fibers in SMA mixtures (discuss further during task force update).

- ii. 3 “adopt or drop” Provisional Standards were omitted from the SOM ballot so an addenda ballot was issued. All three provisional standards were adopted as full standards.
 - 1. PP 60 - R 83
 - 2. PP 61 - R 84
 - 3. TP 79 - T378

B. TS Ballots

- i. SOM_TS2D-17-01 - TP 107 – FHWA submitted proposed changes to address equipment issues. Ballot passed with no negatives (p. 10) and several comments. Editorial comments from Kansas have been incorporated. The remaining comments are addressed by FHWA below and in Attachment A3:

Agency	Comments	Response
Maryland	<p>If using the AMPT to temperature-condition the specimens, skip to Section ?11.7.</p> <p>The above comment indirectly refers that move to 11.7 and perform test after conditioning samples in AMPT chamber. The IPC AMPT we have is not sufficient to keep two specimens (test and dummy) in it at same time. So how do we condition sample in AMPT chamber then?</p> <p>On a separate note, it is useful if you mention some sort of training or special certification requirements in-order to perform this test and analyze the results.</p>	<p>Thank you for the comment. Section 11.4 has been reworded to clarify: <i>“If using a separate chamber to temperature-condition the specimens, continue to Section 11.5. If using the AMPT to temperature-condition the specimens, the conditioning time must be calibrated before testing. A “dummy” specimen should be placed in the AMPT and conditioned. Monitor the temperature during conditioning to calibrate the time to reach the test temperature. Users conducting conditioning in the AMPT can then skip to Section 11.7.</i></p> <p>Note 13—Use of a separate chamber to temperature-condition specimens is advantageous only if the specimen can be secured to the testing machine quickly. Otherwise temperature conditioning in the machine may be more efficient.”</p> <p>Thank you. There is no training or special certification needed for this test or analysis method. Instructional videos and other training methods are provided at this time by FHWA, but nothing formal is available. A training course may be developed on AMPT testing methods in general (to update the previous FHWA-NHI-131118 course), but that is not a given.</p>
Tennessee	<p>Note 16 in Section 11.17 says “A factor of 5 to 15 for machine compliance is reasonable to expect, and should be calculated by the AMPT.” Why less than 5 compliance factors are not reasonable. I can understand over 15 will not be acceptable because of load cell, but I cannot understand why less than 5 matter.</p>	<p>Thank you for the comment. A clarification was provided to illustrate that a compliance factor below 5 is not necessarily a problem. <i>“The AMPT should calculate the machine compliance factor. The machine compliance factor must be greater than 1, and the typical range for this test is 5 to 15.”</i></p>
Alabama	<p>Tailoring the test method to the AMPT equipment really did clarify the test document. The text still needs some work - but only one real comment. 12.4 does not tell the user to compute or determine anything just gives several equations and tells about variability and the need for smoothing. Does that mean these equations should be used or not?</p>	<p>Thank you for the comment. The proposed clarification to Section 12.4 is: <i>“Optimize the coefficients in Equation 3 and Equation 7 simultaneously. Because measured data contain some variability, this smoothing process is needed to obtain reliable coefficients.”</i></p>
Ohio	<p>Table 1, Figure 2, Section 6.3, etc.: Should there be English unit? Table 1: Make sure last note (I think it says b) is with the table and not on next page.</p> <p>Hard to read Table 2.</p> <p>Based on past experience reviewing standards, just make sure the equations, tables, figures referenced match.</p>	<p>The English units have been added throughout.</p> <p>Regarding Note b on Table 1 – we were unsure whether AASHTO’s editors would address this or not. Therefore, we left as-is for now, but can change if needed. The term “Case” was changed to “Fingerprint Dynamic Modulus” for clarity. The caption of Table 2 added “(ϵ_{os1})” to match with the nomenclature used in the table. Units for strain were also provided. Thank you for the comment.</p>
Illinois	<p>The Hirsch model equation for the Maximum E' (equation 4 in Section 12.4) seems to be based on the Christensen et al. (2003) paper. However, in discussing this equation with Dr. Christensen, he stated that the revised Hirsch model equation provided in Christensen and Bonaquist (2015) may be a more accurate method. This revised model includes the effects of aggregate bulk</p>	<p>Thank you for the excellent comment. To be consistent with PP 61, the revision team has not considered changing the Hirsch model version at this point. However, the revision team will begin looking into the 2015 Hirsch model more closely and may suggest a joint change with TP 107 and PP 61 at a future date if the data warrants.</p>

	specific gravity which may play a role in relaxation modulus when using aggregates with relatively high or low bulk specific gravity. Has there been any consideration to use the 2015 revised Hirsch model in this calculation?	
Kansas	Grammatical: 12.18 No closing parentheses after the word "superscripts" Formatting: 12.25 Delete tab space on Fvalley. The equal signs do not line up and are lined up elsewhere throughout method.	Incorporated

- ii. SOM_TS2D-17-02 - TP 124 – Comments from TS Ballot SOM_TS2D-16-02 were forwarded to ILDOT, ILDOT submitted an updated version of TP 124 for ballot. Ballot passed with no negatives (pp. 11-14) and many comments. ILDOT has submitted an updated version (attachment A4) and addressed specific comments below (responses to technical comments are highlighted for separation from editorial responses):

Agency	Comments	Response
D'Angelo Consulting, LLC	Under significance and use it should be added that the testing has been done on short term aged materials. the results of testing of long term aged or old in place pavements have yet to be evaluated.	This test method was evaluated using aged field cores in the initial research study completed by Al-Qadi et al. (2015). The Illinois Department of Transportation has evaluated laboratory long term aged specimens using this procedure as well. A current research study at the University of Illinois is developing a laboratory long term aging protocol for the flexibility index test. As a result, there was no statement added to the significance and use section.
Pennsylvania	<p>1) On page 1 and 2, revise year designation to appropriate year for the revisions.</p> <p>2) In Section 1.1, 1st sentence, "Mode I" is referenced, but it is not defined or mentioned anywhere else in the standard. Either define it in Section 3 or consider eliminating it from Section 1.1.</p> <p>3) Consider revising Figure 1 caption to read "FIT SGC Laboratory Compacted Specimen Configuration (dimensions in millimeters)" since this configuration may not apply to field pavement core test specimens. Section 9.1 allows field pavement core test specimens to have a diameter of 150 +/- 8 mm which is larger than the 150 +/- 1 mm diameter in Figure 1.</p> <p>4) In Section 6.1.2 and Note 2, the use of the word "shall" in this note typically means this is a requirement. Requirements are not typically included as a note. Suggest considering deleting this sentence as Note 2, and adding this sentence as the next to last sentence in Section 6.1.2.</p> <p>5) Related to previous comment, Figure 2 and Figure 3 appear to show the roller width as 102 mm in both "ELEVATION" views, not the minimum 65 mm indicated in the Note 2. Figure 2 and Figure 3 dimensions of 102 mm would control since, as written, the minimum 65 mm is indicated in a non-mandatory Note. Suggest the sentence in Note 2 and the Figure 2 and Figure 3 dimensions for roller width agree with each other.</p> <p>6) In Section 6.1.4, next to last line, revise from "0.01mm" to "0.01 mm" (i.e., add space between "0.01" and "mm").</p> <p>7) In Section 9.1, several different terminologies start to be used for field pavement core specimens. First sentence uses "pavement cores". Third sentence uses "field specimens". Previous Section 1.2, 2nd sentence, uses "field core specimens". Section 9.1.2 subtitle uses "Field Cores". Section 9.1.2.1 subtitle uses "Field Specimens" and then Section 9.1.2.1, 1st sentence uses "pavement core" and 2nd sentence</p>	<p>The year was revised to the appropriate year for the revisions</p> <p>Fracture in Mode I was defined as the tensile opening mode during crack propagation in Section 1.1. (Same comment from Florida and Arizona)</p> <p>The Figure 1 caption was revised to the commented title.</p> <p>This sentence was moved from Note 2 to the second to last sentence of Section 6.1.2.</p> <p>Figures 2 and 3 were modified to show agreement with Note 2</p> <p>The space between "0.01" and "mm" was added.</p> <p>The term "pavement core" was used to replace "field specimens", "field core specimens", and "field cores" to improve consistency.</p>

<p>uses "field core". It is suggested to be consistent with how field pavement cores are being referred to in all areas/locations within the standard.</p> <p>8) In Section 9.1, 2nd sentence, revise from "The final FIT" to "If laboratory compacted SGC specimens are used, the final FIT" to match format of beginning of 3rd sentence.</p> <p>9) In Section 9.1, 3rd sentence, revise from "the final test specimen" to "the final FIT specimen" to match similar language in 2nd sentence.</p> <p>10) In Section 9.1, last line, revise from "25 to 50 mm thick" to "25 to 50 +/- 1 mm thick" to match similar language in Section 9.1.2.1, end of 3rd & beginning of 4th line.</p> <p>11) In Section 9.1., last line, revise from "available layer thickness" to "available field layer thickness" for better clarity.</p> <p>12) In Section 9.1 and Note 3, 4th line, revise from "When cutting the FIT specimens, it is" to "When cutting the FIT specimens into semi-circular halves, it is" for better clarity with last part of sentence which mentions "the two halves".</p> <p>13) In Section 9.1 and Note 3, last line, revise from "affect the results" to "affect the FIT results".</p> <p>14) In Section 9.1.1., 3rd line, revise from "thick discs (see Figure 4)" to "thick discs with smooth parallel faces by saw cutting (see Figure 4)".</p> <p>15) In Section 9.1.1 and Note 4, 1st line, revise from "that the minimum height" to "that the height" as the word "minimum" is used later in the same sentence.</p> <p>16) In Section 9.1.1 and Note 4, last line, revise from "individual FIT specimens" to "individual FIT specimens (see Figure 4)" so its clear that Figure 4 also shows FIT specimen preparation from a 115 +/-1 mm tall SGC specimen.</p> <p>17) In Section 9.1.2, suggest adding something to end of this section concerning the air voids of the field pavement core specimens. It is assumed that they can be any air void level since they are prepared from field pavement cores which are likely to be more variable than FIT specimens prepared from laboratory compacted SGC specimens. However, if you have to test a minimum of 3 SCB specimens for a FIT result, should air voids of field pavement cores be within some overall range or be within some +/- percent air void of each other? Some guidance on air voids of FIT specimens prepared from field pavement cores would be good to include here if guidance is available.</p> <p>18) In Section 9.1.2.1, 6th & 7th line, the sentence regarding "If lift thickness is greater than 50 +/- 1 mm" and relation to last two lines of this section making reference to "as-compacted faces may be utilized", can more guidance be provided here concerning the as-compacted face? If the field pavement core layer thickness is greater than 50 mm, should user always try and retain the "as-compacted face" and saw cut off the bottom portion of layer to get to the 50 +/- 1 mm thickness? Or, should the "as-compacted face" be the side to always saw-cut off? Some more guidance on saw-cutting field pavement cores when the core layer thickness is greater than 50 mm would be helpful due to not knowing affect of the "as-compacted face" on the FIT results.</p>	<p>This sentence was revised to follow the comment.</p> <p>This sentence was revised to follow the comment.</p> <p>The last line in Section 9.1 containing "25 to 50 mm thick" was modified to "25 to 50 +/- 1 mm thick".</p> <p>The phrase "available layer thickness" was revised to "available field layer thickness".</p> <p>This sentence was revised to follow the comment.</p> <p>The phrase "affect the results" was revised to "affect the FIT results".</p> <p>The phrase "thick discs (see Figure 4)" was revised to "thick discs with smooth parallel faces by saw cutting (see Figure 4)".</p> <p>The phrase "that the minimum height" was revised to "that the height".</p> <p>The phrase "individual FIT specimens" was revised to "individual FIT specimens (see Figure 4)".</p> <p>Section 9.1.2.1 was modified by adding the following sentences to describe pavement core air voids. "The air void contents of each disc shall be determined according to AASHTO T 269. Pavement cores will not be subject to air void content tolerances."</p> <p>Section 9.1.2.1 was modified to provide guidance regarding pavement core saw cutting. The section was modified to produce the following section. 9.1.2.1. <i>Pavement Core Specimen Preparation</i>—Prepare four replicate FIT specimens using pavement cores obtained from a pavement lift, with smooth, parallel surfaces that conform to the height and diameter requirements specified herein. To preserve and maximize core thickness, the as-compacted face shall be utilized as well as a sawed face. The thickness of test specimens in most cases for field cores may vary from 25 to 50 ± 1 mm. If the lift thickness is less than 50 ± 1 mm, test specimens should be prepared as thick as possible but in no case be less than two times the nominal maximum aggregate size of the mixture or 25 ± 1 mm, whichever is greater. If lift thickness is greater than 50 ± 1 mm, a 50 ± 1 mm disc shall be prepared as specified in 9.1. Cores from pavements with lifts greater than 75 ± 1 mm may be cut to provide two cylindrical specimens of equal thickness. In the upper-most pavement layer when cored, the as-compacted face will remain intact and one cut will be made to produce a disc at least two times the nominal maximum aggregate size of the mixture or 25 ± 1 mm, whichever is greater. In all</p>
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<p>19) In Section 10.1.1, it is suggested to revise this subsection in some fashion as it is a little confusing with the language "within 0.5Å°C of the desired 25 +/- 0.5Å°C". A revision of some fashion is also recommended as this subsection starts out "The temperature of the specimen shall be maintained...throughout the conditioning and testing periods". In Section 10.1, the conditioning time and temperature is intended to prepare the test specimens to be at the correct test temperature. At the beginning of the conditioning period, the test specimens may not be at the correct test temperature, so conditioning is getting the specimens to the correct test temperature. It is suggested that Section 10.1.1 be revised to just deal with the test temperature. As a result, it is suggested to revise Section 10.1.1 to read "<i>Test Temperature Control</i>-- Immediately after removing the test specimen from the conditioning water bath or environmental chamber, complete positioning and testing of the test specimen for FIT results within 5 +/- 1 minutes." This suggested language prevents the user from somehow trying to monitor and verify that the test temperature of specimen is within the 25 +/- 0.5Å°C temperature range (how would this be accomplished?), but gives a time limit for positioning and completing the FIT result to ensure test specimen is maintained close to the conditioning temperature range.</p> <p>20) In Section 10, add a new Section 10.3.3 that reads "Repeat Section 10.1 to 10.3.2 for each test specimen (minimum of 3 specimens required for FIT results)."</p> <p>21) In Section 11.2, it is suggested to somehow revise "<i>G_f</i> (RILEM TC 50-FMC)" as it is not very clear that the "(RILEM TC 50-FMC)" refers to the Reference in Section 16.1.</p> <p>22) In Section 11.2, suggest revising from "(the area under the load versus average load line displacement curve" to "(the average area under the load versus load line displacement curve" as the location of the word "average" here is confusing. Is this "average" from the minimum 3 FIT specimens and if so, why isn't "(the average load versus average load line displacement curve" used? The equation (4) also does not make any reference to "average" values. So, is the fracture energy calculated individually for each of the minimum 3 FIT specimens and then the individual fracture energy values are averaged? I would think the individual results from each FIT specimen are determined, including <i>G_f</i> and <i>F_I</i>, and then an average <i>G_f</i> and <i>F_I</i> are calculated. However, this is slightly confusing here due to wording and placement of the word "average". Section 13, Reporting, seems to lead that the individual <i>G_f</i> and <i>F_I</i> results are averaged afterwards and not the averages of the load-LLD curve to calculate only one <i>G_f</i> and <i>F_I</i>.</p>	<p>subsequent discs cut from that pavement core, two sawed faces may be used to produce smooth, parallel surfaces. The air void contents of each disc shall be determined according to AASHTO T 269. Pavement cores will not be subject to air void content tolerances. Cut each cylindrical specimen exactly in half to produce two identical, semicircular specimens. Each disc of the field core shall have parallel smooth faces. The suggested revision in Section 10.1.1 was used to clarify temperature requirements. The revised section 10.1.1 now reads as follows:</p> <p>10.1.1 <i>Test Temperature Control</i>-- Immediately after removing the test specimen from the conditioning water bath or environmental chamber, complete positioning and testing of the FIT specimen within 5 +/- 1 minutes to ensure that the specimen temperature is maintained.</p> <p>The suggested addition of Section 10.3.3 was added.</p> <p>The RILEM TC 50-FMC reference in parentheses was modified in Section 11.2 to improve clarity. The paragraph description of fracture energy now reads, "<i>Fracture Energy (G_f)</i>--The fracture energy <i>G_f</i>, determined as per the RILEM TC 50-FMC (1985) approach, is calculated by dividing the work of fracture (the area under the load versus the load line displacement curve; see Figure 5) by the ligament area (the product of the ligament length and the thickness of the specimen) of the FIT specimen prior to testing." The phrase "average load line displacement" was revised to "load line displacement" to improve clarity</p>
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	<p>23) In Section 11.7, there definitely begins the use of the terms "load displacement curve" or "load-displacement curve" especially in Appendix A; however, previously (see Section 6.1.5 for example), the use of the term "load-LLD curve" was used. It is suggested to be consistent in referring to this curve throughout the standard. It appears that the proper reference should be "load-LLD curve".</p> <p>24) In Section 12.1, it indicates that a correction factor will be applied for specimen thickness, but does not give any details of how this is applied or what the correction factors are to be. How is a correction factor for specimen thickness specifically to be applied?</p> <p>25) In Section 13.1.3, should this be revised from "Thickness <i>t</i> and ligament length" to "Average thickness <i>t</i> and average ligament length" based on language in Section 9.4 which indicates to "record the average value" or "average value recorded" for each of these dimensions?</p> <p>26) In Section A.3.3, 5th line, revise from "A1" to "A.1".</p> <p>27) In Equations A.2, A.3, and A.9, should "(pre - peak)" be revised to "(pre-peak)" to match spacing before and after the hyphen used within the text of the standard?</p> <p>28) In Section A.4.1, should "ufinal" and "Pfinal" be "uf" and "Pf" to match Figure A.1 or visa-versa?</p> <p>29) In Section A.4.3, revise from "A4" to "A.4".</p> <p>30) In Equation A.8 and A.9, should "(post - peak)" be revised to "(post-peak)" to match the spacing format before and after the hyphen used within the text of the standard?</p>	<p>All occurrences of "load displacement curve" and "load-displacement curve" were replaced with "load-LLD curve" for consistency in a new Section 11.6 and throughout the document.</p> <p>A preliminary correction factor has been developed at the University of Illinois in Al-Qadi <i>et al.</i> (2015) (Footnote 1 on pg. 1) to adjust the flexibility index (FI) of pavement cores with insufficient thickness. The relationship is shown on pg. 56 as equation 5.6 of Al-Qadi <i>et al.</i> (2015) (Footnote 1 on pg. 1). The correction factor was developed using lab compacted, dense graded mixture specimens intentionally cut thin. The correction factor still needs to be validated by comparing the FI of pavement <u>cores</u> with the proper thickness, <u>to cores</u> with various insufficient thickness. While this correction factor will account for most of the difference between <u>lab compacted specimens</u> (at correct thickness) to thinner <u>pavement cores</u>, there are a number of other variables that contribute to the remaining differences between <u>lab compacted specimens</u> and <u>pavement cores</u> including additional aging due to haul time, differences in compaction etc. It is recommended that local correction factors be developed by the using agencies for local mix types and materials. (Similar comment from Florida, Kansas, and Wisconsin is further addressed by ILDOT below) The phrase "Thickness <i>t</i> and ligament length" was revised to "Average thickness <i>t</i> and average ligament length".</p> <p>The symbol "A1" was revised to "A.1".</p> <p>The spaces before and after the hyphen were removed.</p> <p>The variables "u_{final}" and "P_{final}" were revised to "u_f" and "P_f" to match Figure A.1.</p> <p>The symbol "A4" was revised to "A.4"</p> <p>The spaces before and after the hyphen were removed.</p>
Florida	<p>Section 1.1, bottom of paragraph: It is mentioned the Flexibility Index (FI) is used to determine the crack resistance of an asphalt mixture. It would be beneficial for new users to include a statement that higher values of FI are better than lower values.</p> <p>Figure 1: FDOT agrees with the comment provided by "zehrthg" regarding increasing the notch width and tolerance. The comment by "zehrthg" is: "The notch width of 1.5 mm equals 0.059 in. Commercially available saw blades are available rated at 0.06 in. thickness. These generally are somewhat thicker than 0.06 in., so this notch width and tolerance may need to be increased to 0.075 Å± 0.005 in (for instance)."</p> <p>Figure 2: Recommend putting the elevation view to the left of the cross-section A-A. That is the natural flow when viewing the diagram.</p> <p>Figure 3: Recommend putting the elevation view to the left of the cross-section A-A. That is the natural flow when viewing the diagram.</p> <p>Section 9.1.1, Note 4: FDOT agrees with the comment provided by "zehrthg" regarding gyratory sample compacted height. The comment by "zehrthg"</p>	<p>The discussion of higher values of FI demonstrating improved cracking resistance is presented in Section 5 in Significance and Use. The Scope section is used to introduce the test method. As a result, the discussion of higher or lower FI values will remain only in the Significance and Use section. The previously balloted version of TP 124 was modified to increase the notch width tolerance.</p> <p>The comment was considered. However, there are no requirements regarding the location of elevation views in reference to cross-section views. As a result, the diagram was not modified.</p> <p>The comment was considered. However, there are no requirements regarding the location of elevation views in reference to cross-section views. As a result, the diagram was not modified.</p> <p>The use of 150 mm tall gyratory specimens may be a future avenue to consider. However, limited data exists regarding potential differences in flexibility index as a function of</p>

	<p>is: "Certain gyratory compactors may have difficulty achieving a compacted height of 160 mm, but can achieve a height of 150 mm. A small amount of work has indicated that cutting 2) 50 mm thick discs from a 150mm tall gyratory brick may also be acceptable." Can this alternative be included in the method?</p> <p>Section 9.1.2.1, last sentence: There is the following statement: "To preserve and maximize core thickness, as-compacted faces may be utilized as well as sawed faces." Has this been verified to produce the same results as specimens with two sawed faces? The density in the top portion (3/16" - 1/4") of a core on the side of the as-compacted face is less than the remainder of the core. This could potentially affect the test results.</p> <p>Section 11.2, variables "Area", "r", and "a": Though it isn't difficult to figure out, a reference to a simple diagram illustrating each variable would be beneficial.</p> <p>Section 11.3, Secant Modulus: Why is this being calculated? It is not used anywhere that I can see.</p>	<p>gyratory height. As a result, adding more alternatives beyond 115 or 160 mm was not considered at this time. Alternative heights may be a more appropriate approach in state modified versions of the specification to account for the local materials and gyratory compactors.</p> <p>It is agreed that density changes from the top of the as-compacted face to the remainder of the core. However, preserving the maximum amount of specimen thickness is expected to have a greater impact on the flexibility index parameter. The specification was modified in Section 9.1.2.1 as per the response to the Pennsylvania Department of Transportation comment to indicate that the first disc cut from each core will keep the as-compacted face and have one sawn face. This should create consistency in lab preparation. The comment was considered. However, adding further detail to Figure 1 may make the diagram difficult to understand. As a result, no modifications were made in reference to this comment.</p> <p>Secant modulus was removed from the specification because it is not used in the calculation of the Flexibility Index.</p>
Arizona	In Figure 3, the lines in the specimen in the Isometric View could be white as in Section A-A.	The lines in the Isometric View in Figure 3 are not white because the cut face of the specimen is viewed from that angle. As a result, Figure 3 was not modified.
Illinois	<p>In Section 12.2, modify the first sentence to "Apply a shift factor between SGC and pavement core specimens based on the age of field specimens and differences between field and lab compaction."</p> <p>In Section 13.1.2, report the air void content to the nearest "0.1%"</p>	<p>Section 12 was modified to the following to consider this comment and others.</p> <p>12. CORRECTION FACTORS</p> <p>12.1. <i>Correction Factors for Flexibility Index</i>—Flexibility index correction factors for pavement core specimen thickness and differences between field and lab compaction may be needed. A thickness correction factor may be applied for field cores tested at thickness less than 45 mm. The correction factors may require local calibration to consider locally available materials and mixture design requirements. This change was made to Section 13.1.2.</p>
Kansas	<p>6 Apparatus - Two models are shown. At the yearly SOM meeting it was mentioned that the two models had different results. This doesn't appear to state this or account for any potential differences. So are the two models identical in results?</p> <p>12. - Correction Factors - These need further development if they are going to be included in a Test method and should not include verbiage such as "may be needed". Possibly moved to the Appendix or removed until developed further. The Shift Factor is also an issue being that it should be understood that conditioning will play a role in results. Unless a method on determining the Shift Factor is included, I would also move or remove this.</p>	<p>A research study at the University of Illinois conducted an evaluation of the different models available. This study (ICT R27-SP31) found no statistical difference between the two models. The research report is in the process of finalization at the current time and will be available soon. (Similar comment from Wisconsin)</p> <p>This comment was answered in response to a similar comment by Pennsylvania Department of Transportation.</p>
Wisconsin	<p>4.1 "the FIT test..." should just state the FIT, as the T in FIT is for Test. This repeats several times through the document.</p> <p>Figure 1: Should a ligament length be specified to ensure specimens are cut to the appropriate size.</p> <p>5.3. Change "inputted in" to "input to"</p> <p>6.1 - Do we need to be specific on the servo-hydraulic or screw driven. Maybe just state a machine capable of providing a LLD and sampling rate as stated in 6.1.5 and leave it at that. That would allow for future</p>	<p>All instances of "FIT test" were change to "FIT"</p> <p>The notch length is the critical dimension as opposed to the ligament length. Since different blade thicknesses may be used and slight differences may occur when cutting the disks into semi-circles, the ligament length may vary slightly at times. This difference is approximately accounted for in the calculation of the ligament area when determining the fracture energy in Section 11.2.</p> <p>The word "inputted" was changed to "input".</p> <p>Currently, these are the only methods available to the test method requirements. As a result, no changes were made to the specification in reference to this comment. At the time that future innovations which meet the test requirements are found, the specification can be revisited.</p>

	<p>equipment innovations.</p> <p>Figure 2 & 3, the lines for the 120.0mm spacing should go up into the center of the rollers for clarity.</p> <p>Note 5 - is the notch terminating in aggregate important? Internally the notch may terminate in aggregate as well?</p> <p>10.1.1 - state either within 0.5C or +/- 0.5C, not both.</p> <p>10.3 - don't need "small" to describe the 0.1kN load.</p> <p>10.3.2 - need to add stroke control as well to be consistent.</p> <p>16 - References - Why is this here? Is this needed?</p>	<p>The comment was considered. Extending the lines to the center of the rollers would travel through parts of the FIT fixture such as the base. As a result, no changes were made to Figures 2 and 3 because lines through parts would indicate segmentation that does not exist.</p> <p>It was considered important in the original research study by Al-Qadi <i>et al.</i> (2015). No further research has been completed on this topic to consider its removal. As a result, Note 5 was not modified in regard to notches terminating in aggregate. A revision was made to use +/- 0.5°C in 10.1.1.</p> <p>The word "small" was removed from the specification in Section 10.3.</p> <p>The test was developed by Al-Qadi <i>et al.</i> (2015) considering LLD control only. The stroke control rate will be a function of the testing machine. As a result, the stroke control rate cannot be stated explicitly in the specification. A machine by machine comparison would need to be made in reference to the 50 mm/min LLD control rate to determine the appropriate stroke control rate.</p> <p>The References section was moved to combine it with Section 2 (Reference Documents). In addition, references to these documents were made in Sections 5 and 11. Furthermore, the papers previously shown in Section 16.2-16.5 have been removed because they were not referenced within the body of the specification.</p>
Missouri	<p>1) On Page 2, appears Section 3.1.2 does not lineup with the wording which use to be Section 3.1.1.</p> <p>2) On Page 3, Sections 3.1.13, 3.1.14, and 3.1.15 have been added with no wording. Appears these new sections are not needed.</p> <p>3) On Page 4, the figure does not have a label (Figure 1).</p> <p>4) On Page 10, the figure does not have a label. Believe it should be labeled "Figure 2 - Method A". The equipment shown is for performing the tests in accordance with Section 6.1.2.1 (Method A - Rollers mounted on bearings).</p>	<p>The comment was considered. No changes were made to the specification because the definition of LVDT has remained the same in multiple iterations of the document.</p> <p>The comment was considered. Sections 3.1.13 through 3.1.15 are no longer in the specification.</p> <p>The figure has a label in its current form.</p> <p>The figure has a label in its current form.</p>

- iii. SOM_TS2D-17-03 - Proposed new standards – During the June 6th webinar we discussed several proposed new standards. One general comment from this ballot was the individual standards should have been addressed separately. The Chair agrees and will treat each standard separately on future ballots.
 - 1. M.I.S.T. – There was a misunderstanding on the Chair’s part regarding the MOU between ASTM and AASHTO in this instance. After review by AASHTO staff it was decided the proposed AASHTO version of this standard was too like its ASTM counterpart, D7870, to publish as is and still honor the MOU. One recommendation is to rewrite the standard focusing on the differences from ASTM to generate a unique standard if states are interested.
 - 2. C-I-R – Two proposed new standards dealing with C-I-R mix design using foamed asphalt. The standards passed with no negatives (pp. 20-23) and several comments. The comments were sent to NCAT for responses. However, because the TS ballot closed the Friday before TS Agendas were due to AASHTO, comments from NCAT are not included in this document and will be distributed electronically to the TS members ahead of this meeting.
 - 3. IDT for Dynamic Modulus – Three proposed new standards dealing with using the IDT to determine Dynamic Modulus. There is one negative vote from Wisconsin (pp. 18-20) and several comments. The comments were sent to Dr. Richard Kim at NCSU for responses. However, because the TS ballot closed the Friday before TS Agendas were due to AASHTO, comments from Dr. Kim are not included in this document and will be distributed electronically to the TS members ahead of this meeting.

C. Task Force Reports

Requesting a TS member take over SMA fibers task force if TS is still interested in exploring additional fiber types. TS Chair agreed to chair task force but that is not happening.

V. New Business

- A. Research Proposals
 - 1. 20-7 RPS – Modifications to Superpave Guidelines to Optimize Asphalt Content was accepted for funding during at the AASHTO Spring Meeting.
 - 2. Full NCHRP RPS – None?
- B. AASHTO Re:source - Observations from Assessments?
- C. NCHRP Issues – Amir?
- D. Correspondence, calls, meetings – None other than the June 6th webinar already discussed.
- E. Presentation by Industry/Academia
 - i. Dale Decker – Dale S. Decker, LLC - NCHRP Project 20-07/Task 382. "Longer Pavement Life from Increased In-Place Density of Asphalt Pavements"
 - ii. Dr. Richard Kim – NCSU (?)
 - iii. Dr. Randy West, NCAT – Balanced Mix Design Research/Cold Recycled Mixtures with Foamed Asphalt
- F. Proposed New Standards – See above discussion. Summarized:
 - i. PP XXX – Determining Optimum Asphalt Content of Cold Recycled Mixture with Foamed Asphalt
 - ii. MP XXX – Mix Design of Cold Recycled Mixture with Foamed Asphalt
 - iii. TP XXX – Determining Dynamic Modulus for Hot Mix Asphalt (HMA) Using the Indirect Tension Testing Method
 - iv. MP XXX – Preparation of Indirect Tension Performance Test Specimens
 - v. MP XXX – Developing Dynamic Modulus Master Curves for Hot Mix Asphalt (HMA) Using the Indirect Tension Testing Method
- G. Proposed New Task Forces
- H. Standards Requiring Reconfirmation (Attachment A5)
 - i. T 283 – Reconfirm
 - ii. MP 23 – Reconfirm
 - iii. PP 77 – Reconfirm
 - iv. PP 78 – Revised in 2017
 - v. TP 107 – Currently Revising
 - vi. TP 108 – Reconfirm
 - vii. TP 124 – Currently Revising
 - viii. TP 125 – Reconfirm
- I. SOM Ballot Items (including any ASTM changes/equivalencies)

VI. Open Discussion

VII. Adjourn

Item Number:	1	
Description:	Please consider the proposed revisions. They deal with larger NMAS mixes, AMPT setup, calculations, etc.	
Decisions:	Affirmative: 30 of 36 Negative: 0 of 36 No Vote: 6 of 36	
Agency (Individual Name)	Comments	Decision
Maryland Department of Transportation (Sejal Barot) (sbarot@sha.state.md.us)	<p>If using the AMPT to temperature-condition the specimens, skip to Section ?11.7.</p> <p>The above comment indirectly refers that move to 11.7 and perform test after conditioning samples in AMPT chamber. The IPC AMPT we have is not sufficient to keep two specimens (test and dummy) in it at same time. So how do we condition sample in AMPT chamber then?</p> <p>On a separate note, it is useful if you mention some sort of training or special certification requirements in-order to perform this test and analyze the results.</p>	Affirmative
Tennessee Department of Transportation (Brian K. Egan) (brian.egan@tn.gov)	<p>comment</p> <p>Note 16 in Section 11.17 says "A factor of 5 to 15 for machine compliance is reasonable to expect, and should be calculated by the AMPT." Why less than 5 compliance factors are not reasonable. I can understand over 15 will not be acceptable because of load cell, but I cannot understand why less than 5 matter.</p>	Affirmative
Alabama Department of Transportation (Lyndi D Blackburn) (blackburnl@dot.state.al.us)	<p>Tailoring the test method to the AMPT equipment really did clarify the test document. The text still needs some work - but only one real comment.</p> <p>12.4 does not tell the user to compute or determine anything just gives several equations and tells about variability and the need for smoothing. Does that mean these equations should be used or not?</p>	Affirmative
Ohio Department of Transportation (Eric R Biehl) (Eric.Biehl@dot.ohio.gov)	<p>Ohio DOT does not perform this test, so comments below are in general.</p> <p>Table 1, Figure 2, Section 6.3, etc.: Should there be English unit?</p> <p>Table 1: Make sure last note (I think it says b) is with the table and not on next page.</p> <p>Hard to read Table 2.</p> <p>Based on past experience reviewing standards, just make sure the equations, tables, figures referenced match.</p>	Affirmative
Illinois Department of Transportation (Brian Pfeifer) (brian.pfeifer@illinois.gov)	<p>The Hirsch model equation for the Maximum E' (equation 4 in Section 12.4) seems to be based on the Christensen et al. (2003) paper. However, in discussing this equation with Dr. Christensen, he stated that the revised Hirsch model equation provided in Christensen and Bonaquist (2015) may be a more accurate method. This revised model includes the effects of aggregate bulk specific gravity which may play a role in relaxation modulus when using aggregates with relatively high or low bulk specific gravity. Has there been any consideration to use the 2015 revised Hirsch model in this calculation?</p>	Affirmative
Kansas Department of Transportation (Christopher Leibrock) (christopher.leibrock@ks.gov)	<p>Grammatical: 12.18 No closing parentheses after the word "superscripts"</p> <p>Formatting: 12.25 Delete tab space on Fvalley. The equal signs do not line up and are lined up elsewhere throughout method.</p>	Affirmative

Date: 7/8/2017

Item Number:	1
Description:	<p>Please review the attached documents and indicate your approval or rejection of the final version, with any appropriate comments.</p> <p>The PDF file contains a clean version of the final draft. The other .DOCX files contain "tracked changes." The document ending "13M" contains all the revisions from the original version. The document ending "3M" contains the revisions from the version balloted in October 2016.</p>
Decisions:	<p>Affirmative: 34 of 36</p> <p>Negative: 0 of 36</p> <p>No Vote: 2 of 36</p>

Agency (Individual Name)	Comments	Decision
D'Angelo Consulting, LLC (John Anthony Dangelo) (johndangelo@dangeloconsultingllc.com)	Under significance and use it should be added that the testing has been done on short term aged materials. the results of testing of long term aged or old in place pavements have yet to be evaluated.	
Pennsylvania Department of Transportation (Timothy L Ramirez) (tramirez@pa.gov)	<p>Affirmative with comments (comments based on clean PDF version):</p> <ol style="list-style-type: none"> 1) On page 1 and 2, revise year designation to appropriate year for the revisions. 2) In Section 1.1, 1st sentence, "Mode I" is referenced, but it is not defined or mentioned anywhere else in the standard. Either define it in Section 3 or consider eliminating it from Section 1.1. 3) Consider revising Figure 1 caption to read "FIT SGC Laboratory Compacted Specimen Configuration (dimensions in millimeters)" since this configuration may not apply to field pavement core test specimens. Section 9.1 allows field pavement core test specimens to have a diameter of 150 +/- 8 mm which is larger than the 150 +/- 1 mm diameter in Figure 1. 4) In Section 6.1.2 and Note 2, the use of the word "shall" in this note typically means this is a requirement. Requirements are not typically included as a note. Suggest considering deleting this sentence as Note 2, and adding this sentence as the next to last sentence in Section 6.1.2. 5) Related to previous comment, Figure 2 and Figure 3 appear to show the roller width as 102 mm in both "ELEVATION" views, not the minimum 65 mm indicated in the Note 2. Figure 2 and Figure 3 dimensions of 102 mm would control since, as written, the minimum 65 mm is indicated in a non-mandatory Note. Suggest the sentence in Note 2 and the Figure 2 and Figure 3 dimensions for roller width agree with each other. 6) In Section 6.1.4, next to last line, revise from "0.01mm" to "0.01 mm" (i.e., add space between "0.01" and "mm"). 7) In Section 9.1, several different terminologies start to be used for field pavement core specimens. First sentence uses "pavement cores". Third sentence uses "field specimens". Previous Section 1.2, 2nd sentence, uses "field core specimens". Section 9.1.2 subtitle uses "<i>Field Cores</i>". Section 9.1.2.1 subtitle uses "<i>Field Specimens</i>" and then Section 9.1.2.1, 1st sentence uses "pavement core" and 2nd sentence uses "field core". It is suggested to be consistent with how field pavement cores are being referred to in all areas/locations within the standard. 8) In Section 9.1, 2nd sentence, revise from "The final FIT" to "If laboratory compacted SGC specimens are used, the final FIT" to match format of beginning of 3rd sentence. 9) In Section 9.1, 3rd sentence, revise from "the final test specimen" to "the final FIT specimen" to match similar language in 2nd sentence. 10) In Section 9.1, last line, revise from "25 to 50 mm thick" to "25 to 50 +/- 1 mm thick" to match similar language in Section 9.1.2.1, end of 3rd & beginning of 4th line. 11) In Section 9.1., last line, revise from "available layer thickness" to "available field layer thickness" for better clarity. 12) In Section 9.1 and Note 3, 4th line, revise from "When cutting the FIT specimens, it is" to "When cutting the FIT specimens into semi-circular halves, it is" for better clarity with last part of sentence which mentions "the two halves". 13) In Section 9.1 and Note 3, last line, revise from "affect the results" to "affect the FIT results". 14) In Section 9.1.1., 3rd line, revise from "thick discs (see Figure 4)" to 	Affirmative

	<p>"thick discs with smooth parallel faces by saw cutting (see Figure 4)".</p> <p>15) In Section 9.1.1 and Note 4, 1st line, revise from "that the minimum height" to "that the height" as the word "minimum" is used later in the same sentence.</p> <p>16) In Section 9.1.1 and Note 4, last line, revise from "individual FIT specimens" to "individual FIT specimens (see Figure 4)" so its clear that Figure 4 also shows FIT specimen preparation from a 115 +/-1 mm tall SGC specimen.</p> <p>17) In Section 9.1.2, suggest adding something to end of this section concerning the air voids of the field pavement core specimens. It is assumed that they can be any air void level since they are prepared from field pavement cores which are likely to be more variable than FIT specimens prepared from laboratory compacted SGC specimens. However, if you have to test a minimum of 3 SCB specimens for a FIT result, should air voids of field pavement cores be within some overall range or be within some +/- percent air void of each other? Some guidance on air voids of FIT specimens prepared from field pavement cores would be good to include here if guidance is available.</p> <p>18) In Section 9.1.2.1, 6th & 7th line, the sentence regarding "If lift thickness is greater than 50 +/- 1 mm" and relation to last two lines of this section making reference to "as-compacted faces may be utilized", can more guidance be provided here concerning the as-compacted face? If the field pavement core layer thickness is greater than 50 mm, should user always try and retain the "as-compacted face" and saw cut off the bottom portion of layer to get to the 50 +/- 1 mm thickness? Or, should the "as-compacted face" be the side to always saw-cut off? Some more guidance on saw-cutting field pavement cores when the core layer thickness is greater than 50 mm would be helpful due to not knowing affect of the "as-compacted face" on the FIT results.</p> <p>19) In Section 10.1.1, it is suggested to revise this subsection in some fashion as it is a little confusing with the language "within 0.5Å°C of the desired 25 +/- 0.5Å°C". A revision of some fashion is also recommended as this subsection starts out "The temperature of the specimen shall be maintained...throughout the conditioning and testing periods". In Section 10.1, the conditioning time and temperature is intended to prepare the test specimens to be at the correct test temperature. At the beginning of the conditioning period, the test specimens may not be at the correct test temperature, so conditioning is getting the specimens to the correct test temperature. It is suggested that Section 10.1.1 be revised to just deal with the test temperature. As a result, it is suggested to revise Section 10.1.1 to read "<i>Test Temperature Control</i>--Immediately after removing the test specimen from the conditioning water bath or environmental chamber, complete positioning and testing of the test specimen for FIT results within 5 +/- 1 minutes." This suggested language prevents the user from somehow trying to monitor and verify that the test temperature of specimen is within the 25 +/- 0.5Å°C temperature range (how would this be accomplished?), but gives a time limit for positioning and completing the FIT result to ensure test specimen is maintained close to the conditioning temperature range.</p> <p>20) In Section 10, add a new Section 10.3.3 that reads "Repeat Section 10.1 to 10.3.2 for each test specimen (minimum of 3 specimens required for FIT results)."</p> <p>21) In Section 11.2, it is suggested to somehow revise "<i>Gf</i> (RILEM TC 50-FMC)" as it is not very clear that the "(RILEM TC 50-FMC)" refers to the Reference in Section 16.1.</p> <p>22) In Section 11.2, suggest revising from "(the area under the load versus average load line displacement curve" to "(the average area under the load versus load line displacement curve" as the location of the word "average" here is confusing. Is this "average" from the minimum 3 FIT specimens and if so, why isn't "(the average load versus average load line displacement curve" used? The equation (4) also does not make any reference to "average" values. So, is the fracture energy calculated individually for each of the minimum 3 FIT specimens and then the individual fracture energy values are averaged? I would think the individual results from each FIT specimen are determined, including <i>Gf</i> and FI, and then an average <i>Gf</i> and FI are calculated. However, this is slightly confusing here due to wording and placement of the word "average". Section 13, Reporting, seems to lead that the individual <i>Gf</i> and FI results are averaged afterwards and not the averages of the load-LLD curve to calculate only one <i>Gf</i> and FI.</p> <p>23) In Section 11.7, there definitely begins the use of the terms "load displacement curve" or "load-displacement curve" especially in Appendix A;</p>	
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	<p>however, previously (see Section 6.1.5 for example), the use of the term "load-LLD curve" was used. It is suggested to be consistent in referring to this curve throughout the standard. It appears that the proper reference should be "load-LLD curve".</p> <p>24) In Section 12.1, it indicates that a correction factor will be applied for specimen thickness, but does not give any details of how this is applied or what the correction factors are to be. How is a correction factor for specimen thickness specifically to be applied?</p> <p>25) In Section 13.1.3, should this be revised from "Thickness <i>t</i> and ligament length" to "Average thickness <i>t</i> and average ligament length" based on language in Section 9.4 which indicates to "record the average value" or "average value recorded" for each of these dimensions?</p> <p>26) In Section A.3.3, 5th line, revise from "A1" to "A.1".</p> <p>27) In Equations A.2, A.3, and A.9, should "(pre - peak)" be revised to "(pre-peak)" to match spacing before and after the hyphen used within the text of the standard?</p> <p>28) In Section A.4.1, should "ufinal" and "Pfinal" be "uf" and "Pf" to match Figure A.1 or visa-versa?</p> <p>29) In Section A.4.3, revise from "A4" to "A.4".</p> <p>30) In Equation A.8 and A.9, should "(post - peak)" be revised to "(post-peak)" to match the spacing format before and after the hyphen used within the text of the standard?</p>	
<p>Florida Department of Transportation (Timothy J. Ruelke) (timothy.ruelke@dot.state.fl.us)</p>	<p>With the following comments:</p> <p>Section 1.1, first sentence: Mode 1 cracking should be defined, such as "Mode 1 cracking is defined as opening mode cracking, a tensile stress normal to the plane of the crack." Note, this definition is from Wikipedia.</p> <p>Section 1.1, bottom of paragraph: It is mentioned the Flexibility Index (FI) is used to determine the crack resistance of an asphalt mixture. It would be beneficial for new users to include a statement that higher values of FI are better than lower values.</p> <p>Section 1.2, last sentence: It would be beneficial if the method describes how to develop the thickness correction factor for cores less than 45 mm thick.</p> <p>Figure 1: FDOT agrees with the comment provided by "zehrtdg" regarding increasing the notch width and tolerance. The comment by "zehrtdg" is: "The notch width of 1.5 mm equals 0.059 in. Commercially available saw blades are available rated at 0.06 in. thickness. These generally are somewhat thicker than 0.06 in., so this notch width and tolerance may need to be increased to 0.075 ± 0.005 in (for instance)."</p> <p>Figure 2: Recommend putting the elevation view to the left of the cross-section A-A. That is the natural flow when viewing the diagram.</p> <p>Figure 3: Recommend putting the elevation view to the left of the cross-section A-A. That is the natural flow when viewing the diagram.</p> <p>Section 9.1.1, Note 4: FDOT agrees with the comment provided by "zehrtdg" regarding gyratory sample compacted height. The comment by "zehrtdg" is: "Certain gyratory compactors may have difficulty achieving a compacted height of 160 mm, but can achieve a height of 150 mm. A small amount of work has indicated that cutting 2) 50 mm thick discs from a 150 mm tall gyratory brick may also be acceptable." Can this alternative be included in the method?</p> <p>Section 9.1.2.1, last sentence: There is the following statement: "To preserve and maximize core thickness, as-compacted faces may be utilized as well as sawed faces." Has this been verified to produce the same results as specimens with two sawed faces? The density in the top portion (3/16" - 1/4") of a core on the side of the as-compacted face is less than the remainder of the core. This could potentially affect the test results.</p> <p>Section 11.2, variables "Area", "r", and "a": Though it isn't difficult to figure out, a reference to a simple diagram illustrating each variable would be beneficial.</p> <p>Section 11.3, Secant Modulus: Why is this being calculated? It is not used anywhere that I can see.</p> <p>Section 12, Correction Factors: More direction needs to be provided for these correction factors or else everyone will be calculating them in a different way.</p>	<p>Affirmative</p>
<p>Arizona Department of Transportation (Paul Burch) (pburch@azdot.gov)</p>	<p>Should "Mode I cracking resistance" be defined in the Terminology Section? The definition may not be known by a typical test method user.</p> <p>In Figure 3, the lines in the specimen in the Isometric View could be white as in Section A-A.</p>	<p>Affirmative</p>

<p>Illinois Department of Transportation (Brian Pfeifer) (brian.pfeifer@illinois.gov)</p>	<p>In Section 12.2, modify the first sentence to "Apply a shift factor between SGC and pavement core specimens based on the age of field specimens and differences between field and lab compaction." In Section 13.1.2, report the air void content to the nearest "0.1%"</p>	<p>Affirmative</p>
<p>Kansas Department of Transportation (Christopher Leibrock) (christopher.leibrock@ks.gov)</p>	<p>Approve with a couple comments below: 6 Apparatus - Two models are shown. At the yearly SOM meeting it was mentioned that the two models had different results. This doesn't appear to state this or account for any potential differences. So are the two models identical in results? 12. - Correction Factors - These need further development if they are going to be included in a Test method and should not include verbiage such as "may be needed". Possibly moved to the Appendix or removed until developed further. The Shift Factor is also an issue being that it should be understood that conditioning will play a role in results. Unless a method on determining the Shift Factor is included, I would also move or remove this.</p>	<p>Affirmative</p>
<p>Wisconsin Department of Transportation (Barry C Paye) (barry.paye@dot.wi.gov)</p>	<p>I have voted affirmative, but the below need changes or addressing: Suggested Edits/Changes: 1.2 - What is the correction factor. It is alluded to as well in section 12, but none is provided. If a correction factor is needed, it needs to be provided, otherwise, don't mention one. 4.1 "the FIT test....." should just state the FIT, as the T in FIT is for Test. This repeats several times through the document. Figure 1: Should a ligament length be specified to ensure specimens are cut to the appropriate size. 5.3. Change "inputted in" to "input to" 6.1.2 - I would suggest that only method A or B is specified, as the base roller could be a source of error in the test. Pick whichever method provides the best support and most repeatable results. Based on the constant width, I would suggest method A seems to be a better option. 6.1 - Do we need to be specific on the servo-hydraulic or screw driven. Maybe just state a machine capable of providing a LLD and sampling rate as stated in 6.1.5 and leave it at that. That would allow for future equipment innovations. Figure 2 & 3, the lines for the 120.0mm spacing should go up into the center of the rollers for clarity. Note 5 - is the notch terminating in aggregate important? Internally the notch may terminate in aggregate as well? 10.1.1 - state either within 0.5C or +/- 0.5C, not both. 10.3 - don't need "small" to describe the 0.1kN load. 10.3.2 - need to add stroke control as well to be consistent. 12.1 - need to define correction factor, as previously stated. 16 - References - Why is this here? Is this needed?</p>	<p>Affirmative</p>
<p>Missouri Department of Transportation (Brett Steven Trautman) (brett.trautman@modot.mo.gov)</p>	<p>Affirmative vote with some editorial comments: 1) On Page 2, appears Section 3.1.2 does not lineup with the wording which use to be Section 3.1.1. 2) On Page 3, Sections 3.1.13, 3.1.14, and 3.1.15 have been added with no wording. Appears these new sections are not needed. 3) On Page 4, the figure does not have a label (Figure 1). 4) On Page 10, the figure does not have a label. Believe it should be labeled "Figure 2 - Method A". The equipment shown is for performing the tests in accordance with Section 6.1.2.1 (Method A - Rollers mounted on bearings).</p>	<p>Affirmative</p>

Date: 7/8/2017

Proposed New Standards

Item Number:	1
Description:	<p>M.I.S.T. This is a proposed new standard to determine moisture sensitivity by pore pressure. The documents relevant to this item are:</p> <ul style="list-style-type: none"> • Test Method • Ruggedness study • Proposed TRB submission • IOWA DOT research
Decisions:	<p>Affirmative: 34 of 37 Negative: 0 of 37 No Vote: 3 of 37</p>

Agency (Individual Name)	Comments	Decision
Maryland Department of Transportation (Sejal Barot) (sbarot@sha.state.md.us)	----- It is okay to adopt as a new standard.	Affirmative
Pennsylvania Department of Transportation (Timothy L Ramirez) (tramirez@pa.gov)	<p><u>Affirmative with comments:</u></p> <p>1) In Section 1.1, consider revising from "This practice" to "This test method" since it seems there will be a test result from this standard.</p> <p>2) In Section 2.2, delete reference to "D6857 Test Method for Maximum Specific Gravity and Density of Bituminous Paving Mixtures Using Automatic Vacuum Sealing Method" since Section 2.1 already makes reference to T 331 which is similar test method.</p> <p>3) In Section 2.2, delete reference to "D6931 Test Method for Indirect Tensile (IDT) Strength of Bituminous Mixtures" since Section 2.1 already includes reference to T 283 which includes the indirect tensile strength test procedure.</p> <p>4) In Section 3.1, 4th line, revise from "decreasinghydrostatic" to "decreasing hydrostatic".</p> <p>5) In Section 3.1, 7th line, revise from "The strength ratio" to "The tensile strength ratio" to make terminology in T 283.</p> <p>6) In Section 3.1, 8th line, revise from "moisture damage on the indirect tensile strength" to "moisture damage on the mixture specimens" since "tensile strength ratio" is already included in first part of this sentence.</p> <p>7) In Section 4.1, 2nd line, revise from "cyclic loading" to "cyclic hydrostatic loading".</p> <p>8) In Section 4.1, revise from "apparatussection" to "apparatus section",</p> <p>9) In Section 4.1, 3rd & 4th line, revise from "creating pore pressure" to "creating hydrostatic pore pressure".</p> <p>10) In Section 4.1, 5th line, revise from "temperatures and conditions" to "temperatures and moisture conditions".</p> <p>11) In Section 4.2, 1st line, revise from "damageto occur in asphalt mix" to "damage to occur in asphalt mixture".</p> <p>12) In Section 4.2, 3rd line, revise from "water, stress" to "water, cyclic applied stress".</p> <p>13) In Section 4.2, consider deleting the last sentence as it does not add anything here.</p> <p>14) In Section 4.3, 1st line, revise from "indirect tensile strength ratio" to "tensile strength ratio" to match terminology in T 283.</p> <p>15) In Section 4.3, Note 1, consider deleting this note as having AASHTO R 18 Accreditation and having accreditation for T 283 would also provide similar assurance to having accreditation to ASTM D3666. If Note 1 is deleted, delete D3666 from Section 2.2.</p> <p>19) In Section 5.1, revise entirely to read "Equipment for compacting specimens according to R 68, T 247, or T 312. Delete reference to ASTM D8079 as this is for slabs and it is assumed additional equipment would be needed to drill 4" or 6" diameter specimens from the slab. Additionally, D8079 is not included in Section 2.2.</p> <p>20) In Section 5.4, 1st line, revise from "conditioningtwo" to "conditioning two".</p> <p>21) In Section 5.4, 2nd line revise from "cyclic pressure" to "cyclic hydrostatic pressure".</p> <p>22) In Section 5.4, 2nd line, revise from "should be capable" to "shall be capable".</p>	Affirmative

	<p>23) In Section 5.4, 3rd line, revise from "function in shape with" to "function, in shape, with".</p> <p>24) In Section 5.4, 4th line, revise from "and the width of the pressure peak at half maximum of 1 +/- 0.5 s" to "and a pressure duration of 1.0 +/- 0.5 s at or above one-half of the maximum peak pressure".</p> <p>25) In Section 5.4.1, revise from "purging (de-airing) and removing air" to "purging or removing air (de-airing)".</p> <p>26) In Section 5.4.3, revise from "should be" to "shall be".</p> <p>27) In Section 6.1, revise from "diameterspecimens" to "diameter specimens" and consider deleting the second sentence as this Section 6 is only for preparation of the specimens. If the 2nd sentence is not deleted, revise from "Half of" to "One-half of" and revise from "tested dry" to "unconditioned" and revise from "and other half are to be tested after moisture conditioning" to "and the other one-half are to be conditioned using the apparatus in Figure 1".</p> <p>28) In Section 6.2, 2nd sentence, revise to read "If aggregate larger than 25 mm is present in the asphalt mixture, use 150 mm diameter and 95 +/- 5 mm high specimens." Also, since the height has a tolerance, a tolerance should be given for the diameters as well and that are consistent with the tolerances in R 68, T 247, and T 312.</p> <p>29) In Section 6.3, 1st sentence, revise from "to prepare the samples" to "prepare and condition each asphalt mixture sample".</p> <p>30) In Section 7.1, D3666 does not include any direction about selecting a truck to be sampled. Suggest revising to indicate selecting random sample.</p> <p>31) In Section 7.2, revise similarly to comments for Section 6.1.</p> <p>32) In Section 7.3, revise 2nd sentence similarly to comments for Section 6.2.</p> <p>33) In Section 7.3, Note 2, last line, revise from "100 mmm" to 100 mm".</p> <p>34) In Section 8.3, revise entirely to read "Determine the theoretical maximum specific gravity of each asphalt mixture sample in accordance with T 209". As curing/conditioning of laboratory mixed and plant-mixed asphalt mixture is already covered in T 209. Also, you do not want to take field cores and determine theoretical maximum specific gravity from broken down field cores as these cores may be conditioned differently than the asphalt mixture samples used to prepare, condition, and compact the specimens. Also, delete reference to "D6857" as this is vacuum sealing for bulk specific gravity of compacted specimens and is not the theoretical maximum specific gravity of the asphalt mixture.</p> <p>35) In Section 8.6, only two 150 mm diameter or three 100 mm diameter specimens are indicated, but in Section 6.1 and Section 7.2, three 150 mm diameter specimens and four 100 mm diameter specimens are to be prepared and compacted. What is to be done with the remaining specimen? If this remaining specimen is to be used in selecting the two 150 mm diameter or three 100 mm diameter specimens to match air voids, it is suggested to indicate that here.</p> <p>36) In Section 9.1, 2nd sentence, it indicates "The system shall be capable of conditioning three 100 mm" specimens, but in Section 5.4, it indicates system shall be "capable of conditioning two or more" specimens. It seems that the 2nd sentence of Section 9.1 should be moved to Section 5.4. Or, at least be consistent with the capabilities of the system in all areas of the standard.</p> <p>37) In Section 9.2, shouldn't this water temperature be consistent with the water bath temperature in Section 5.3 or tap water temperature? The system shall have the capability to control the temperature to higher temperatures than the water bath or tap water, but at this point in the test, the system has not been turned on yet (See Section 9.12).</p> <p>38) In Section 9.11.1, revise from "wet" to "conditioned".</p> <p>39) In Section 12.2, revise from "wet" to "conditioned".</p> <p>40) In Section 14.1, revise from "ASTM D6752" to "T 331".</p> <p>41) In Section 14.2, delete "or D6931".</p> <p>42) In Section 15.2, revise from "indirect tensile (IDT) strength ratio" to "tensile strength ratio (TSR)" for consistency with terminology in T 283.</p> <p>43) In Section 16, add a new subsection to "Report the tensile strength ratio (TSR), to the nearest 0.01".</p>	
<p>Maine Department of Transportation (Richard L Bradbury) (richard.bradbury@maine.gov)</p>	<p>4.3: Suggest removing Note 1. This is true of any test method.</p> <p>5.2: Suggest changing reference from T 166 to M 231.</p> <p>5.4, 2nd sentence: Change "The system should be capable..." to "The system shall be capable..."</p> <p>5.4.3 & 5.4.5: replace "should" with "shall"</p> <p>8.2: Appears to be the 1st mention of cores - suggest adding language earlier regarding applicability to testing roadway cores, with appropriate references for</p>	<p>Affirmative</p>

	<p>coring.</p> <p>8.3: May want to clarify in Sections 6 and 7 that companion samples are needed for Gmm determination (as described in T 312). For cores, is a separate core obtained for determining Gmm?</p> <p>10.6: "Allow 2 to 3 min for the specimens to cool." - This sounds like a guideline; is it intended to be a maximum of 3 minutes? If so, suggest rewording to avoid misinterpretation for lab assessment purposes. Same for "2h to 3 h" in 10.7.</p> <p>13.6: Same as above.</p>	
New Hampshire Department of Transportation (Denis M. Boisvert) (denis.boisvert@dot.nh.gov)	<p>Section 2.1 & 2.2: Change font.</p> <p>Page 4: Footnote 1 (font?); footnote has a footnote designation within it?</p> <p>Section 9.2: Delete second "water" (after temperatures).</p> <p>Section 12.8: Reference at the end should be (Section 11.3).</p> <p>Note 4: Revise font.</p> <p>Section 14.1.2: Typo. Bulf should be Bulk.</p> <p>Section 15.3: Should equation font match text?</p>	Affirmative
Illinois Department of Transportation (Brian Pfeifer) (brian.pfeifer@illinois.gov)	Section 5.4. What is "Lorentzian function"? Should this be defined or should a reference be given?	Affirmative
Wisconsin Department of Transportation (Barry C Paye) (barry.paye@dot.wi.gov)	Please ensure that this procedure, going forwarder, mirrors ASTM D7870.	Affirmative
Ontario Ministry Of Transportation (Becca Lane) (becca.lane@ontario.ca)	<p>Section 7.1 notes field samples are taken from the truck at the plant. Consider noting an alternative for taking field samples from the paving site.</p> <p>Section 14 ASTM D6752 and AASHTO R79 are noted as an alternate in procedure but not listed under reference documents.</p>	Affirmative
Missouri Department of Transportation (Brett Steven Trautman) (brett.trautman@modot.mo.gov)	<p>Affirmative vote with editorial comments:</p> <p>1) A section should be added near the beginning of the specification stating that English and SI units should not be used together. The units are not interchangeable.</p> <p>2) English units need to be added to the following sections: 5.5, 6.2, 7.3, 8.6, 9.10.1, 9.10.2, 11.2, 12.1.1, 12.1.2, 16.1.3, 16.1.4, 16.1.6, and 17.1</p> <p>3) English units need to be added to Note 2</p> <p>4) In Section 6.2, the second sentence, don't believe the following is needed, "by 95 +/- 5 mm high". Appears to be redundant. Recommend the sentence read as "Specimens 150 mm [6 inch] in diameter should be used if aggregate larger than 25 mm [1 inch] is present in the mixture."</p> <p>5) In Section 7.3, the second sentence, don't believe the following is needed, "by 95 +/- 5 mm high". Appears to be redundant. Recommend the sentence read as "Specimens 150 mm [6 inch] in diameter should be used if aggregate larger than 25 mm [1 inch] is present in the mixture."</p> <p>6) In Section 9.2, 50 deg. C is 122 deg. F not 140 deg. F.</p> <p>7) SI units need to be added to the following sections: 9.9 and 12.5.</p> <p>8) In Section 9.12, at the end of the second line, the parenthesis ")" needs to be replaced with a bracket "]"</p> <p>9) In Section 11.4, the word "Section" needs to be added in front of 12.2 so reads "... temperature of the water bath in Section 12.2. Use...".</p>	Affirmative

Item Number:	2
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Description:	<p>This item concerns three new proposed standards dealing with determining dynamic modulus using the Indirect Tension Test. The documents relevant to this item are:</p> <ul style="list-style-type: none"> • Summary from Dr. Richard Kim • Test Method • Recommended Practice for Specimen Preparation • Recommended Practice for Determining Master Curves.
Decisions:	<p>Affirmative: 33 of 37 Negative: 1 of 37 No Vote: 3 of 37</p>

Agency (Individual Name)	Comments	Decision
Maryland Department of Transportation (Sejal Barot) (sbarot@sha.state.md.us)	----- This is very interesting and okay to adopt.	Affirmative
Pennsylvania Department of Transportation (Timothy L Ramirez) (tramirez@pa.gov)	<p><u>Affirmative with comments:</u> 1) Each of these standards should have been balloted as a separate ballot item.</p> <p>----- <u>Comments from Troy Lehigh, PennDOT Bituminous Studies Manager:</u> 2) Are all of the requirements in PP 60, Section 11 Report needed or can some be made optional?</p>	Affirmative
New Hampshire Department of Transportation (Denis M. Boisvert) (denis.boisvert@dot.nh.gov)	<p>3.6.2: "The" should be "that".</p> <p>4.1: "...modulus from THE indirect tension..."</p> <p>9.3: Suggested edit if appropriate, "...the machine or WHEN the difference..."</p> <p>9.3.3: Capitalize "allen".</p> <p>9.3.4: Delete "with" in line 3, and "for" in line 4.</p> <p>9.4.1: Add "the" before horizontal in line 2, and correct "Finishing" to "Finish in line 4.</p>	Affirmative
Illinois Department of Transportation (Brian Pfeifer) (brian.pfeifer@illinois.gov)	<p><u>Preparation of Indirect Tension Performance Test Specimens</u> Entire Document â€œ In some cases, the units are only shown in millimeters and others are shown with millimeters and inches. All unit declarations should have consistency with one approach or the other. Section 1.1 â€œ It is stated that open-graded HMA can be tested in this procedure. How are the gauges attached? It may be relevant to include further details for open-graded HMA in Section 9.2.1 in the Determining the Dynamic Modulus for Hot-Mix Asphalt (HMA) Using the Indirect Tension Testing Method document. Section 1.1 â€œ It is stated that mixtures with NMAS up to 25 mm can be tested using 38 mm thick cylindrical test specimens. In general, test methods state that a test specimen thickness must be at least twice the NMAS. Is there any published research that supports the use of 38 mm thick cylindrical test specimens with 25 mm NMAS mixtures? If so, the published research should be added and referenced in Section 2.3. Section 2.2 â€œ ASTM D 5361 has the letters "ASTM" in front of "D 5361" while the standard referenced above it only has "D 3549". The letters "ASTM" can be removed because the standard is in the 2.2 ASTM Standards section. Section 3.4 â€œ Poissonâ€™s Effect is referenced in describing tensile stresses and strains which develop in indirect tension tests. This effect may need a separate definition in Section 3 Terminology. Note 1 â€œ The word "of" in the final sentence of the note can be removed. Section 6.4 â€œ Why is a ruler allowed to measure the diameter? If calipers are used to measure the thickness, the same calipers should be used to measure the diameter. Figure 1 â€œ The figure is not completely clear. A higher resolution image would be best to show this view of the marking device. Figure 2 â€œ The schematic of the marking device does not provide all necessary dimensions. More dimensions should be added to Figure 2 to allow the marking device to be replicated.</p>	Affirmative

	<p>Section 10.5.1.1 – In the final sentence, two sawed faces would yield two smooth surfaces. The word "a" in the final sentence can be removed and the word "surface" can be changed to "surfaces".</p> <p>Sections 10.5.3.1 and 10.5.3.2 – There is no Section 6.1.2 in the latest version ASTM D 3549. The reference should be modified in each of these sections. <u>Determining the Dynamic Modulus for Hot-Mix Asphalt (HMA) Using the Indirect Tension Testing Method</u></p> <p>Section 1.1 - It is stated that mixtures with NMAS up to 25 mm can be tested using 38 mm thick cylindrical test specimens. In general, test methods state that a test specimen thickness must be at least twice the NMAS. Is there any published research that supports the use of 38 mm thick cylindrical test specimens with 25 mm NMAS mixtures? If so, the published research should be added and referenced in Section 2.2.</p> <p>Section 3.1 – It is stated that Dynamic Modulus is a fundamental material property. Is this property truly fundamental? Data from a presentation at the Asphalt Mix ETG meeting in May 2017 by Castorena <i>et al.</i> showed that dynamic modulus at high temperatures varies as a function of geometry. As a result, it may be more appropriate to state that it is a performance related property.</p> <p>Figure 1 – The figure of the load guide device may be better represented by using two views from both the front and the side.</p> <p>Figure 2 – The CAD drawings of the alignment device should be provided with all pertinent dimensions to allow readers to replicate the device.</p> <p>Section 6.8 – It is stated that a stiff specimen should be used for alignment. A minimum modulus value for the stiff material should be added because some plastics are not stiff.</p> <p>Section 9 – The Preparation of Indirect Tension Performance Test Specimens Using the Superpave Gyrotory Compactor standard is referenced as AASHTO PP60-14 while it is referenced as AASHTO PPXX-XX in Section 2. The reference needs to be updated in Section 9 to agree with Section 2.</p> <p>Section 9.2.1 – It is stated that the recommended gauge length is 101 mm. This gauge length does not appear to be the same as shown in Figure 1. As a result, Figure 1 or the recommended gauge length in this section needs to be modified in order to agree.</p> <p>Section 9.3.4 – The word "for" in the second to last sentence should be removed.</p> <p>Section 9.5 – How many loading cycles are being applied at each frequency during the test?</p> <p>Section 10.2 – The reference to Chapra and Canale (1985) should be added to Section 2.2.</p> <p>Section 10.5.5 and 10.5.7 – The equations for phase angle are shown in Equations 16 and 19 as phi subscript "ej" while the description of the variables has phi subscript "Vj". Should these variables have the same subscript? <u>Developing Dynamic Modulus Master Curves for Hot-Mix Asphalt Concrete Using the Indirect Tension Testing Method</u></p> <p>Entire Document - The Preparation of Indirect Tension Performance Test Specimens Using the Superpave Gyrotory Compactor and Determining the Dynamic Modulus for Hot-Mix Asphalt (HMA) Using the Indirect Tension Testing Method standards are referenced as AASHTO PP60-14 while they are referenced as AASHTO PPXX-XX in the other proposed IDT dynamic modulus standards. The reference needs to be updated in this document.</p> <p>Section 1.1 - It is stated that mixtures with NMAS up to 25 mm can be tested using 38 mm thick cylindrical test specimens. In general, test methods state that a test specimen thickness must be at least twice the NMAS. Is there any published research that supports the use of 38 mm thick cylindrical test specimens with 25 mm NMAS mixtures? If so, the published research should be added and referenced in Section 2.2.</p> <p>Section 4.1 – The word "manipulating" is used in the final sentence. It is recommended to use the word "fitting" in place of "manipulating".</p> <p>Section 13.1 – Should the reference in 13.1 be placed in Section 2.2 to combine the reference documents?</p>	
<p>Missouri Department of Transportation (Brett Steven Trautman) (brett.trautman@modot.mo.gov)</p>	<p>Affirmative vote with some editorial comments:</p> <p><u>Preparation of ITP Test Specimens</u></p> <p>1) In Sections 6.4, 6.5 and 10.5.3.2 show SI and English units. These are the only times both units are shown. For consistency purposes, recommend only showing the SI units.</p> <p>2) In Sections 10.1.3, 10.3.1 and 10.3.2, the hyphen (-) needs to be removed from in between the R and 30 so it reads "AASHTO R 30" instead of "AASHTO R-30".</p>	<p>Affirmative</p>

	<p>3) In Section 10.7.2, only the English unit is shown. Recommend showing only the SI unit.</p> <p><u>Determining the Dynamic Modulus of HMA Using the IT Testing Method</u></p> <p>1) Several sections show both the SI and English units. To be consistent with the specification involving sample preparation, recommend only showing the SI units.</p>	
Wisconsin Department of Transportation (Barry C Paye) (barry.paye@dot.wi.gov)	<p>Specific dimensions are needed for the devices and fixtures in Figures 1 and 2. Section 9.1.1 - Units vary in specificity - 1.5-2" is not the same as 38mm Section 9.1.2 - List the air void target here, instead of referencing a different procedure. Does Table 4 belong in the standard.</p> <p>Specimen fabrication - Section 6 needs more detail. All items need dimensions.</p> <p>Without the specific detail, I feel this test procedure is not ready, and therefore my negative vote.</p>	Negative

Item Number:	3
Description:	<p>This item is to discuss two new standards addressing Cold In Place or Cold Central Plant recycling using foamed asphalt. The documents relevant to this item are:</p> <ul style="list-style-type: none"> • Summary points from NCAT • Standard Practice for Determining Optimum Asphalt Content • Standard Specification for Mix Design
Decisions:	<p>Affirmative: 34 of 37 Negative: 0 of 37 No Vote: 3 of 37</p>

Agency (Individual Name)	Comments	Decision
Maryland Department of Transportation (Sejal Barot) (sbarot@sha.state.md.us)	----- Maryland uses minimum wet ITS of 45 psi. It is good to have a standard for this method.	Affirmative
Pennsylvania Department of Transportation (Timothy L Ramirez) (tramirez@pa.gov)	<p><u>Affirmative with comments:</u></p> <p>1) These two standards should have been balloted as separate ballot items.</p> <p><u>Comments for Standard Practice:</u></p> <p>1) In Section 1.1, should "bituminous" be "asphalt"? Existing pavements for CIR may be made of several layers of different asphalt-related layers, so "bituminous" may be appropriate here; however, Section 3.3 states "existing asphalt pavement".</p> <p>2) In Section 3.2, should "WMA" be added here as well? Our should it just be "asphalt mixture". Use of HMA is in Section 3.3 and Section 3.4 referring to an overlay, which may well be WMA.</p> <p>3) In Section 4.1, 2nd line, revise from "additivesare" to "additives are".</p> <p>4) In Section 4.3, 2nd line, revise from "orin" to "or in".</p> <p>5) In Section 6.1.1, Note 1, 3rd line, revise from "400 lb(45 kg)" to "400 lb (45 kg)".</p> <p>6) In Section 6.2.2, 1st line, revise from "400 lb(45 kg)" to "400 lb (45 kg)".</p> <p>7) In Section 6.3.2, revise from "gradationband" to "gradation band".</p> <p>8) In Section 6.3.3, Section 7.1, Section 7.2, and Note 5 suggest adding "or T 164" and then adding "T 164, Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA)" to Section 2.1. This gives an option to use one or the other if the issue with correction factors is a concern.</p> <p>9) In Section 8.2, Note 7, add space between 2nd and 3rd sentences.</p> <p>10) In Section 9.2, should there be a standard or standards for determining foamed asphalt expansion ratio and half-life? Or, is there an existing procedure for expansion ratio and half-life that can be referenced here?</p> <p>11) In Section 9.3.1, revise from "orcement" to "or cement".</p> <p>12) In Section 10.1.1, 2nd line, revise from "2.Opercent" to "2.0 percent".</p> <p>13) In Section 10.1.1.1, correct spacing issues between words in multiple</p>	Affirmative

	<p>locations and throughout remainder of standard.</p> <p>14) In Section 10.4.3, 2nd line, revise from "conditioned strength" to "conditioned (wet) strength" for consistency with "(dry)" used earlier in this Section.</p> <p>15) In Section 10.6.4 and 12.1.7, should this be called "tensile strength ratio (TSR)" for consistency with similar terminology in the Standard Specification (See Note 2) and in T 283?</p> <p><u>Comments for Standard Specification:</u></p> <p>1) Correct spacing between words throughout standard (e.g., In Section 1.2, revise from "foamedasphalt" to "foamed asphalt").</p> <p>2) In Section 3.2, should "WMA" be added here as well? Our should it just be "asphalt mixture". Use of HMA is in Section 3.3 and Section 3.4 referring to an overlay, which may well be WMA.</p> <p>3) In Section 5.1, it refers to "shall fall within the band", but Table 1 does not show bands for each sieve size. Table 1 only shows a single number for the Coarse Limit and for the Fine Limit. Are the Coarse and Fine Limits to be the minimum and maximum percent passing for each sieve size? Table 1 is slightly confusing as to its intent. Table 1 columns could be confused with coarse RAP and fine RAP depending on the existing asphalt pavement layers.</p> <p>4) In Section 5.2, should "WMA" be included here or revise from "HMA" to "asphalt mixture"?</p> <p>5) In Section 6.1.1, should M 332 (MSCR) be included here for those states specifying PGAB by M 332?</p> <p>6) In Section 6.1.2, Note 3, this Note does not seem consistent with Section 3.3 and 3.4 where it indicates both CIR and CCPR "is used as a base layer".</p> <p>-----</p> <p><u>Comments from Troy Lehigh, PennDOT Bituminous Studies Manager:</u></p> <p>7) I'm assuming that labs would need to purchase a lab foamer to create the foamed asphalt for this? The proposed practice and specification don't provide much information about the foamer or the foaming process.</p>	
<p>Maine Department of Transportation (Richard L Bradbury) (richard.bradbury@maine.gov)</p>	<p>Determination of Optimum Asphalt Content of Cold Recycled Mixture with Foamed Asphalt</p> <p>6.3.1: "Sieve the RAP according to T 27..." - suggest changing to "Conduct a sieve analysis in accordance with T 27 on a representative sample of the RAP...."</p> <p>Note 5a - suggest changing "Consider corrective aggregate meeting agency requirements..." to "Consider adding aggregate meeting agency requirements..."</p> <p>8.2: Need to add language describing specimen preparation: RAP specimen mass, number of specimens, etc. Or, could change 8.2 to say "Determine the optimum moisture content of a representative sample of the dried RAP in accordance with T 180" and delete remainder of section.</p> <p>Section 9: Suggest adding language as to procedure and apparatus (lab foaming unit) - maybe refer to Wirtgen manual.</p> <p>10.3.1: Suggest including laboratory mixer as a choice.</p> <p>10.3.2: "Add foamed asphalt and mix RAP thoroughly with additives or slurry, and foamed asphalt at room temperature..." - seems confusing. Suggest "Add foamed asphalt to prepared RAP specimen and mix thoroughly at room temperature..."</p> <p>Section 12 - suggest including Binder temperature and foaming water % required to assure proper foaming.</p> <p>Mix Design of Cold Recycled Mixture with Foamed Asphalt</p> <p>No comments.</p>	<p>Affirmative</p>
<p>New Hampshire Department of Transportation (Denis M. Boisvert) (denis.boisvert@dot.nh.gov)</p>	<p>6.2.2: "lb" should be "lbs"</p> <p>7.2: Why is only the ignition method considered when solvent extraction achieves an accurate AC content?</p>	<p>Affirmative</p>

	9.3.1: "lb" should be "lbs".	
Illinois Department of Transportation (Brian Pfeifer) (brian.pfeifer@illinois.gov)	PP xxx-17, "Determination of Optimum Asphalt Content of Cold Recycled Mixture with Foamed Asphalt" Section 6.1.2, Note 2. Will particles break down during crushing? If so, will this gradation be the same as from the full-sized crusher during production? Section 6.2.2. Why wouldn't asphalt content, binder properties, or recovered aggregate gradation analysis of the RAP be wanted? Provide some guidance for the amounts of RAP needed if/when these properties are required. Section 7.3, Note 5. Are there ever cases where low voids, low dry strength, or low retained strength occur even after using 50% corrective aggregates? What then? Sections 9.2, 9.2.1, & 9.2.2. Is there any guidance on how to determine the expansion ratio and half-life, the optimum foaming water content, and the minimum asphalt temperature? Section 9.3. Reword to say: "Select other additives according to MP XX". (or something comparable) Section 10.5.2. Why not cure all the specimens for the same amount of time instead of allowing curing for 24 hours to 72 hours? At least require all the specimens for each specific mix design to be heated the same amount of time. Section 12. Report the gyratory specimen heating time, if allowed to vary. MP xxx-17, "Mix Design of Cold Recycled Mixture with Foamed Asphalt" Section 5.1, Table 1, Note 1, first sentence. Would a specific tolerance be better than "as closely as possible"?	Affirmative
Texas Department of Transportation (Darren Hazlett) (darren.hazlett@txdot.gov)	For CIR, it is difficult to predict the gradation of the material that will be produced by the milling machine from samples taken from the roadway. In some states, gradations are bracketed between a course gradation and a fine gradation and a design for each is done. I'm good with the practice, but I think bracketing helps accommodate changes that occur during the production process. Table 1. in Mix Design Spec should be set up like any other master gradation table. Table 2. in Mix Design Spec. Why 32.7psi? Is there some significance there? Is it just what coverts from 225 kPa?	Affirmative
Wisconsin Department of Transportation (Barry C Paye) (barry.paye@dot.wi.gov)	Design Standard Comments (MP) - Table 1 - The rap gradation seems to be a bit restrictive. I understand the need to control the product as much as possible, but are the defined gradations regularly achievable in the field? 5.2. Insert the word quality into the statement "additional aggregate shall meet agency QUALITY requirements...." Table 2 - Minimum dry strength is low. Wisconsin specs a minimum of 45psi. Can this go higher?	Affirmative
Ontario Ministry Of Transportation (Becca Lane) (becca.lane@ontario.ca)	MP xxx-17 Mix Design of Cold Recycled Mixture with Foamed Asphalt Clause 5 Table 1 <ul style="list-style-type: none"> consider being consistent with the emulsified asphalt's spec., i.e. preparing two out of the three gradation bands for the processed cores. Clause 7 Table 2 <ul style="list-style-type: none"> What is the min. TSR requirement when no additive is added? (refer to Note 2, no active filler will be required when TSR > 0.6) Consider adding raveling test PP xxx-17 Determination of Optimum Asphalt Content of Cold Recycled Mixture with Foamed Asphalt Clause 7.1 <ul style="list-style-type: none"> Refers to the wrong Section. No Section 3.3.4 is found in the spec. Clause 9.3.1 Note 9 <ul style="list-style-type: none"> consider being consistent with the emulsified asphalt spec. where the min. asphalt to cement ratio is 3:1 Clause 10.1.1 Line 2 <ul style="list-style-type: none"> Typical range between 1.0 percent and 4.0 percent Clause 10.6 <ul style="list-style-type: none"> suggest adding the bulk specific gravity test for compacted, cured and cooled specimen using Corelok method, or by measurement method. In this way, the specimens can be grouped into two subsets with close bulk specific gravity. Clause 10.6.3	Affirmative

	<ul style="list-style-type: none"> allow an alternative conditioning method for the dry samples besides water bath, e.g. forced draft oven or at room temperature. allow the dry and moisture-conditioned specimens to be tested on different days, as moisture-conditioned specimens require soaking in a water bath for 24 hours and dry samples only need two hours conditioning time. 	
<p>Missouri Department of Transportation (Brett Steven Trautman) (brett.trautman@modot.mo.gov)</p>	<p>Affirmative vote with editorial comments:</p> <p><u>PP xxx-17</u></p> <p>1) A section should be added near the beginning of the specification stating that English and SI units should not be used together. The units are not interchangeable.</p> <p>2) Section 8.4 and Section 10.1.1.1 need the English units added.</p> <p>3) Table 1 needs to add the English units for temperature.</p> <p>4) Section 9.2 refers to expansion ratio and half-life of foamed asphalt. Did not see any test methods shown. Should reference the test methods in the specification. If no AASHTO or ASTM test methods available, could address in a note stating where these methods can be found.</p> <p><u>MP xxx-17</u></p> <p>1) A section should be added near the beginning of the specification stating that English and SI units should not be used together. The units are not interchangeable.</p> <p>2) Observed that some times the English units are shown first with the SI units following. Other times the SI units are shown first with the English units following. The specification should be consistent throughout the document. Recommend showing the SI units first followed by the English. The units in PP xxx-17 should follow the same order as used in MP xxx-17.</p>	<p>Affirmative</p>

Date: 7/8/2017