TDOT Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

Development of a Balanced Mix Design Procedure for Tennessee Mixtures

LIPSCOMB UNIVERSITY

(University Logo(s) in Footer. Mark as Decorative.)

Research Final Report from Lipscomb University | (Todd A. Lynn, Ph.D., P.E., Mark P. McDonald, Ph.D., P.E. | May 8, 2023

Sponsored by Tennessee Department of Transportation Long Range Planning

Research Office & Federal Highway Administration

DISCLAIMER

This research was funded through the State Planning and Research (SPR) Program by the Tennessee Department of Transportation and the Federal Highway Administration under ***RES #: 2019-05. Research Project Title: Development of a Balanced Mix Design Procedure for Tennessee Mixtures.***

Technical Report Documentation Page

1. Report No. RES2019-05	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle *Development of a Balanced Mix Design Procedure for Tennessee Mixtures*		5. Report Date May 8, 2023 6. Performing Organization Code
7. Author(s) Todd A. Lynn, Ph.D., P.E. and Mark P. McDonald, Ph.D., P.E.		8. Performing Organization Report No.
9. Performing Organization Name and Address Lipscomb University 1 University Park Drive Nashville, TN 37204		10. Work Unit No. (TRAIS) 11. Contract or Grant No. RES2019-05
12. Sponsoring Agency Name and Address Tennessee Department of Transportation 505 Deaderick Street, Suite 900 Nashville, TN 37243		13. Type of Report and Period Covered 14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

Asphalt mixture design involves the determination of the best combination of available materials for optimum in-service performance. Past and current mixture design methodologies, including the prevalent Superpave approach, principally rely on volumetric parameters (e.g., air voids and VMA) to ensure good performance without direct performance measures and criteria incorporated into them. A number of state departments of transportation have recognized the shortcomings of a volumetric only approach. Several states have adopted some form of a Balanced Mix Design (BMD) approach. For BMD, acceptable rutting and cracking resistance is exhibited over a range of binder contents such that the mixture performance is considered "balanced". For this research, 36 TDOT asphalt mixtures were identified from across the three geographical regions of the state: east, middle, and west. These mixes also represented various aggregate and binder types and included RAP. The BMD evaluation involved mixtures prepared in the laboratory at the optimum binder content and 0.5% above the optimum binder content. Prospective BMD tests included the Hamburg Wheel Tracking Test, the Rutting Resistance Tolerance Test (RT_{Index}) and the Indirect Tensile Asphalt Cracking Test (CT_{Index}). In addition, three (3) JMFs were identified as representative for the respective east, middle and west regions of the state. Twelve (12) projects were then chosen for which there was significant confidence that the projects were paved with one of the selected JMFs. More specifically, three (3) projects were chosen that were associated with the east and west regions of the state while six (6) projects were chosen for the Middle Tennessee JMF. These 12 projects were cored, and the upper surface layer(s) were tested to assess cracking performance with respect to the laboratory cracking resistance testing (CT_{Index}). Test results showed the expected sensitivity to increased binder content indicating promise for BMD application in Tennessee.

17. Key Words **ASPHALT MIXTURES, MIX DESIGN, BMD, RUTTING, CRACKING, MOISTURE SUSCEPTIBILITY**	18. Distribution Statement		
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 40	22. Price

Acknowledgements

The authors express their appreciation to the Tennessee Department of Transportation (TDOT) for funding this project and specifically to Matt Chandler, Assistant Director of Materials/Field Operations Engineer. Matt's input and assistance was invaluable to the research team. The authors would also like to thank all of the TDOT staff that helped secure bulk and pavement core samples. Special thanks go to Richard Steger of Ingevity and Cynthia Lynn of Thunderhead Testing for testing services and consulting support.

Executive Summary

Asphalt mixture design involves the determination of the best combination of available materials for optimum in-service performance. Desirable performance aspects include resistance to permanent deformation or rutting, fatigue and thermal cracking, and moisture induced damage (Brown et al., 2009). Past and current mixture design methodologies, including the prevalent Superpave approach, principally rely on volumetric parameters (e.g., air voids and VMA) to ensure good performance without direct performance measures and criteria incorporated into them. A number of state departments of transportation have recognized the shortcomings of a volumetric only approach. Several states have adopted some form of a Balanced Mix Design (BMD) approach which includes volumetric analysis supplemented by performance testing or vice-versa (West et al., 2017). For a BMD approach, acceptable rutting and cracking resistance is exhibited over a range of binder contents such that the mixture performance is considered "balanced".

For this research, 36 TDOT asphalt mixtures were identified from across the three geographical regions of the state: east, middle, and west. These mixes also represented various aggregate and binder types as well as reclaimed asphalt pavement. The BMD evaluation involved mixtures prepared in the laboratory at the optimum binder content and 0.5% above the optimum binder content. Prospective BMD tests included the Hamburg Wheel Tracking Test (HWTT), the Rutting Resistance Tolerance Test (Ideal-RT) and the Indirect Tensile Asphalt Cracking Test (Ideal-CT). In addition, three (3) JMFs were identified as representative for the respective east, middle and west regions of the state. Twelve (12) projects were then chosen for which there was significant confidence that the projects were paved with one of the selected JMFs. More specifically, three (3) projects were chosen that were associated with the east and west regions of the state while six (6) projects were chosen for the Middle Tennessee JMF. These 12 projects were cored, and the upper surface layer(s) were tested to assess cracking performance with respect to the laboratory cracking resistance testing (Ideal-CT).

Key Findings

The results generated for the revised test plan support the following conclusions:

- The Hamburg Wheel Tracking Test and particularly the HWTT metrics Rutting Resistance Index (RRI) and Corrected Rut Depth (CRD) were sensitive to mixture binder content variations.
- Moisture damage susceptibility was evident via HWTT stripping metrics.
- HWTT results exhibited high variability with Coefficient of Variation values as high as 76% for RRI.
- Ideal-RT was sensitive to increased binder content and the test also exhibited a low variability with Coefficient of Variation ranging from 10 to 14 percent.

- Ideal-CT was likewise sensitive to increased binder content. However, Mix D4 and Mix B2 were exceptionally low (CT_{Index}<30). These values would likely be even lower if mixture conditioning (i.e., aging) was harsher.
- Ideal-CT tests of field cores showed results that were in alignment with laboratory prepared test specimens. Given the age of the pavement from which these taken (approximately 5 years), it's likely that mixture conditioning in the lab inadequately represented field conditions.
- From a BMD perspective, the tests evaluated showed significant response and, in some cases, low enough variability to warrant continued consideration and evaluation.

Key Recommendations

The data, results and conclusions presented herein support the following recommendations:

- Further research is needed both in additional BMD benchmark testing but even more so, BMD testing of materials directly linked to field placement and performance monitoring. This way, distinctive and correlative BMD criteria can be established for whatever BMD tests are selected.
- Continue BMD testing with HWTT, Ideal-RT and Ideal-CT as each has shown adequate promise to move forward especially with respect to variability assessment and reduction measures.
- Should TDOT continue to use the Marshall Method of specimen compaction, research should be conducted with the Ideal-RT and Ideal-CT using 4-inch diameter specimens.
- Once BMD criteria have been established, further research is needed to address testing variability and the impact(s) on QC/QA test results.
- Research is needed to address laboratory conditioning (i.e., aging) of mixtures to best replicate field conditions.
- There is a need to better address moisture damage susceptibility and particularly anti-strip effectiveness. The results of this study clearly showed that not all anti-strips are created equal. A process may need to be developed for the establishment of an appropriate anti-strip product and dosage via testing instead of mandate.
- A better moisture damage susceptibility test is needed as well. In the interim, a shift to AASHTO T 283 with a freeze/thaw cycle may better discriminate anti-strips and dosage rates. Ultimately, a shift to HWTT stripping metrics would be ideal.
- Implement Ideal-RT now both in design and QC/QA. Given the low cost, simplicity and speed of test, there is no reason to delay data collection for validation study.

Table of Contents

List of Tables

List of Figures

Glossary of Key Terms and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
APA	Asphalt Pavement Analyzer
ASTM	American Society for Testing and Materials
BMD	Balanced Mix Design
COV	Coefficient of Variation
CRD	Corrected Rut Depth
CS	Creep Slope
CT_{Index}	Metric/Result of the IDEAL-CT Test
DOT	Department of Transportation
ESAL	Equivalent Single Axle Load
FHWA	Federal Highway Administration
FI	Flexibility Index
FN	Flow Number
HMA	Hot Mix Asphalt
HWTT	Hamburg Wheel Tracking Test
IDEAL-CT	Indirect Tensile Asphalt Cracking Test
IDEAL-RT	Rapid Shear Rutting Test
JMF	Job-Mix Formula (Asphalt Mixture Design)
LTOA	Long-Term Oven Aging
MnROAD	Minnesota Road Test Facility
NAPA	National Asphalt Pavement Association
NCAT	National Center for Asphalt Technology
NCHRP	National Cooperative Highway Research Program
NMAS	Nominal Maximum Aggregate Size
PG	Performance Grade
PMS	Pavement Management System
QC/QA	Quality Control/Quality Assurance
RAP	Reclaimed Asphalt Pavement
RAS	Reclaimed Asphalt Shingles
RBR	Recycled Binder Ratio
RRI	Rutting Resistance Index
RT_{Index}	Metric/Result of the IDEAL-RT Test
SGC	Superpave Gyratory Compactor
SIP	Stripping Inflection Point
SN	Stripping Number
SS	Stripping Slope
STOA	Short-Term Oven Aging
TSR	Tensile Strength Ratio
TRD	Total Rut Depth
TTI	Texas Transportation Institute
TDOT	Tennessee Department of Transportation
WMA	Warm Mix Asphalt

Chapter 1 Introduction

Asphalt mixture design involves the determination of the best combination of available materials for optimum in-service performance. Desirable performance aspects include resistance to permanent deformation or rutting, fatigue and thermal cracking, and moisture induced damage (Brown et al., 2009). Past and current mixture design methodologies, including the prevalent Superpave approach, principally rely on volumetric parameters (e.g., air voids and VMA) to ensure good performance without direct performance measures and criteria incorporated into them. A number of state departments of transportation have recognized the shortcomings of a volumetric only approach. Several states have adopted some form of a Balanced Mix Design (BMD) approach which includes volumetric analysis supplemented by performance testing or vice-versa (West et al., 2017). Figure 1.1 shows the BMD concept which provides for a range of acceptable mixture binder contents. Acceptable rutting and cracking resistance are exhibited over this range of binder contents such that the mixture performance is considered "balanced". Figure 1.2 shows three prevalent BMD approaches currently in use or proposed for use. Each of these BMD approaches involves volumetric and performance testing. However, the relative importance of these varies among the approaches.

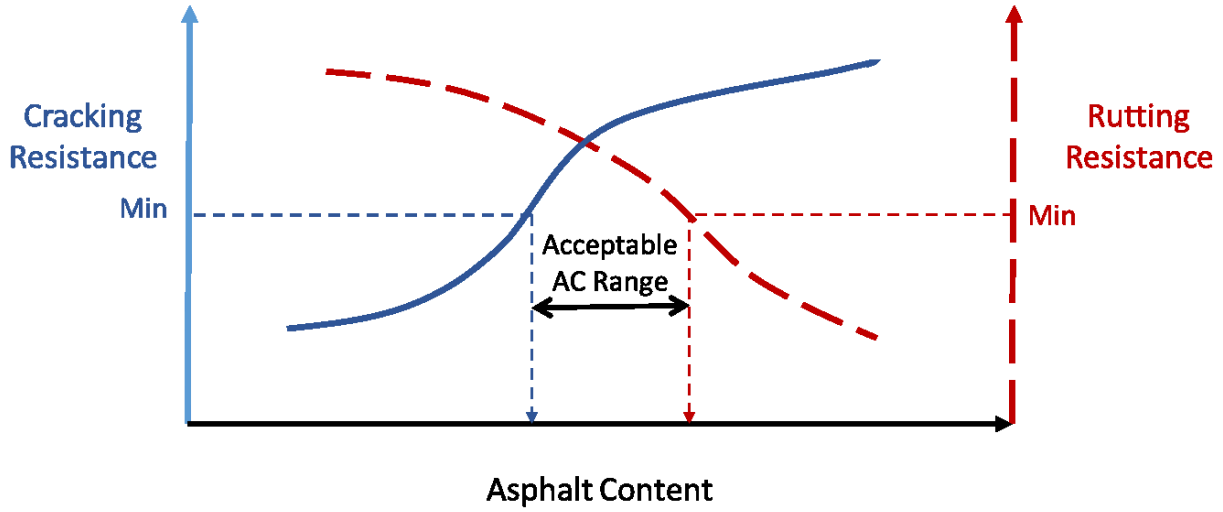


Figure 1.1 BMD Concept. (Newcomb, 2018)

The perspective of this research was to conduct testing which would allow TDOT to incorporate a BMD approach into the current TDOT mix design framework. This conservative approach consisted of 'Volumetric Design with Performance Verification' as shown in Figure 1.2. This approach was recommended for two reasons. First, it seemed reasonable considering the road quality ranking of Tennessee roads. In other words, the need is not to address major problems or introduce major changes but instead to promote incremental performance improvement

while sustaining current best practices. Secondly, a conservative BMD approach allows industry to become acquainted with the newly proposed/implemented BMD tests and the subsequent specification implementation that will follow.

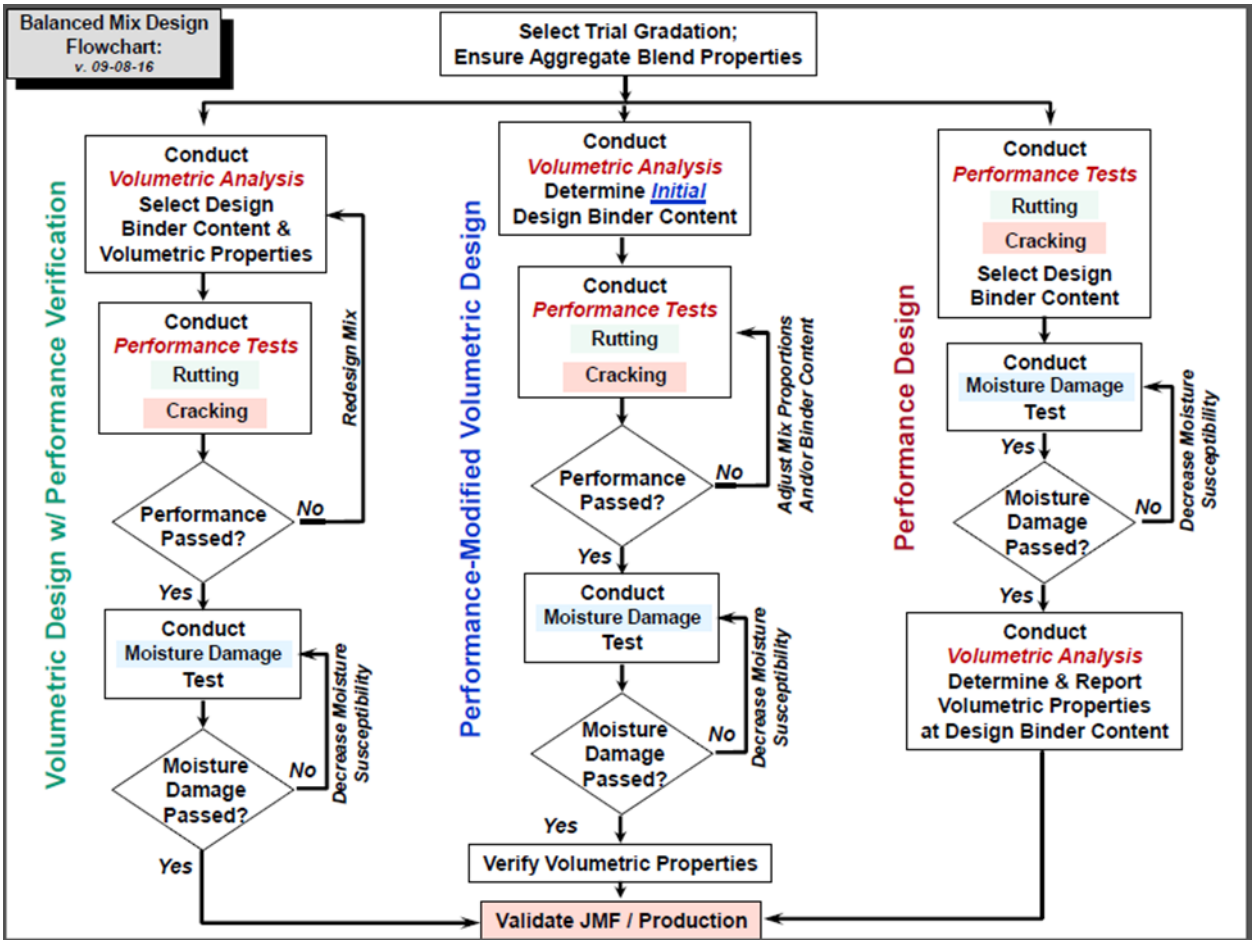


Figure 1.2 BMD Approaches in Use or Proposed for Use by State Departments of Transportation. (Hall, 2016)

1.1 Objective of the Research

The objective of this research was to explore the development of a BMD framework for the Tennessee Department of Transportation. This was accomplished by evaluating existing TDOT mixtures using prospective BMD tests with both laboratory prepared specimens and cores extracted from TDOT pavements.

1.2 Proposed Scope of Work

The original proposed scope of the research included the following tasks in order to completely address the stated research objectives:

1. Review of literature, including the NCHRP 20-07/Task 406 project, involving BMD and tests used within a BMD framework to evaluate the current state of BMD tests and methodologies in use or under investigation/development in the United States.
2. Identify two (2) prospective permanent deformation tests and two (2) prospective cracking assessment tests for use in the TDOT BMD approach.
3. Characterization of current TDOT mixtures using prospective BMD tests/responses.
4. Perform correlation analyses to relate BMD test responses to field performance data. Correlation of prospective BMD tests with field performance using existing TDOT PMS and NCAT Test Track (TN sections) data.
5. Selection of BMD tests from the prospective tests evaluated and based on field performance correlation analyses. The selected BMD tests were to be recommended for incorporation into the TDOT mix design methodology. One rutting test and one cracking test were expected to be selected. The basis for selection was to involve both correlation and variability analyses as well as other important aspects like cost and testing availability. It was thought that other tests could be included as well if it could be shown that their inclusion provided benefits that were likely to outweigh the costs of implementation.
6. Recommendations of reliability-based test specification criteria for the BMD tests selected.
7. A final report describing recommendations for a BMD approach for TDOT asphalt mixture designs. These BMD recommendations were to include both test methods and specification criteria.

1.3 Revised Objectives and Scope of the Research

Once the project was initiated and some of the key literature was reviewed, a pre-work meeting was convened to verify and/or revise the project objectives and scope of work. This meeting took place on April 16, 2019, at TDOT Headquarters and involved the Principal Investigator (PI) and key TDOT Research and Materials & Tests personnel. At this meeting, two (2) permanent deformation tests and two (2) cracking tests were identified for study. These are presented and described in Chapter 2. The testing matrix was refined and expanded to provide characterization of a wider array of TDOT mixtures using the identified BMD tests. Both the proposed and revised testing matrix are presented in Chapter 3.

It also became apparent that Task 4 dealing with the correlation of prospective BMD tests with field performance using existing TDOT pavement management system data and/or NCAT test track data involving the Tennessee sections was not going to be possible. Concerning TDOT PMS data, the reason for this was twofold. First, TDOT reapproves JMFs annually which allows for addressing any necessary adjustments year over year. While sound, this approach makes it difficult to discern exactly which version of the JMF was used for a past paving project for which performance data is desired. Secondly, while TDOT maintains a substantial amount of pavement performance data, a discernible link between the data and a particular JMF was lacking. In the case of the NCAT Test Track performance data, the BMD cracking tests were not performed or did not even exist at the time of construction and monitoring activities. It therefore became

apparent that completion of Task 4 was not going to be possible. As a result, completion of Tasks 5 and 6 would likewise not be possible and would need to be addressed in subsequent follow-on study. Since the relationship between the laboratory test data and field performance data was strongly desired and essential to the assessment of the BMD tests, some means of evaluating the relationship was necessary. To address this, 3 JMFs were identified as representative for the respective east, middle and west regions of the state. Twelve (12) projects were then chosen for which there was significant confidence that the projects were paved with one of the selected JMFs. More specifically, three (3) projects were chosen that were associated with the east and west regions of the state while six (6) projects were chosen for the Middle Tennessee JMF. These 12 projects were cored, and the upper surface layer(s) were tested to assess cracking performance with respect to the laboratory cracking resistance testing.

Chapter 2 Literature Review

With intense interest in BMD implementation, the research community has been very active since 2015. Key BMD resources pertinent to this research effort have been reviewed and presented herein.

2.1 Balanced Mix Design

With the interest in BMD implementation, the research community has been very active since 2015. Key BMD resources include the *Development of a Framework for Balanced Mix Design*, Final Report to the National Cooperative Highway Research Program (NCHRP) Project NCHRP 20-07/Task 406 (West et al., 2018) and the Balanced Mix Design Resource Guide, a webpage hosted by the National Asphalt Pavement Association (NAPA) (NAPA, 2023). The former provides much in the way of background information on the need for and the development of a BMD approach to mix design. A significant outcome of this work was an American Association of State Highway and Transportation Officials (AASHTO) standard provisional practice (AASHTO PP 105-20) regarding BMD and the development of a BMD program. In addition to the approaches shown in Figure 1-2, the NCHRP 20-01/Task 406 report presents a fourth methodology that is slightly less conservative than the *Volumetric Design with Performance Verification* approach. The value of NAPA's webpage resource guide is that the information posted is updated regularly regarding BMD development, testing and the state-of-the-practice.

2.2 Performance Testing

Performance testing is a central tenet of any BMD approach. Tests should reliably indicate mixture performance in the lab and the most likely expected field performance in service. Pavement distresses of interest include rutting resistance, cracking resistance and resistance to moisture induced damage. Historically, agency specifications have been structured to address these independently. As a result, the design binder content seldom falls in the central region of Figure 1.1. In contrast, the BMD concept promotes the highest binder content permissible that satisfies the rutting criterion while simultaneously promoting the lowest binder content satisfying cracking criterion. Any binder content between these two extents represents a balance and an optimum asphalt content range instead of a single optimum design target.

Performance test selection criteria include the following:

1. Equipment cost
2. Specimen preparation involvement and time
3. Data analysis complexity
4. Correlation with field performance
5. Test variability
6. Application to both design lab and production lab (QC/QA)

The best source of summary information about each of the performance tests presented in the subsequent sections of this report is the NAPA BMD Resource Guide (2023). The main landing page link for this site is:

https://www.asphaltpavement.org/expertise/engineering/resources/bmd-resource-guide.

In conjunction with performance testing is the need to identify and specify mixture aging and laboratory test specimen conditioning to replicate the stiffening effect of aging. Newcomb (2018) provided a summary of mixture aging investigations and state-of-the-practice. Laboratory specimen conditioning remains the subject of much debate and research efforts continue with the goal of establishing the most simulative yet shortest duration aging conditions.

2.3 Rutting Tests

Prevalent industry rut testing devices/methods include the Asphalt Pavement Analyzer (APA), the Hamburg Wheel Tracking Test (HWTT), and Superpave Flow Number (FN). A more recent development is the Rapid Shear Rutting Test (Ideal-RT).

The Asphalt Pavement Analyzer (APA) was originally developed as the Georgia Loaded Wheel Tester (Lai, 1986). The APA tracks a loaded wheel across a pressurized hose in contact with the asphalt mixture sample. The test temperature is maintained by controlling the air temperature within the test chamber. Rut depths are measured and recorded along the wheel path. A maximum allowable rut depth at 8,000-wheel passes is typically specified for the testing conditions described in AASHTO T 340. The test reportedly has good correlation to field performance and moderate variability. Significant disadvantages include high initial cost ($100k+), excessive down time and high maintenance cost (NAPA, 2023).

The Hamburg Wheel-Tracking Test (HWTT) is similar to the APA in that a loaded wheel is applied to the mix specimen(s). Temperature control is via water bath, which is more stable than air but creates a confounded stress state if the mixture is susceptible to moisture damage. Rut depths are measured and recorded along the wheel path. A maximum allowable rut depth of 12.5 mm at 10,000-20,000-wheel passes is typically specified for the testing conditions described in AASHTO T 324. In addition, test analysis improvements have been documented in the literature. Yin et al. (2014) developed a method to isolate the viscoplastic permanent deformation and stripping effects as shown in Figure 2.1, which shows the Corrected Rut Depth (CRD) as the Total Rut Depth less the rutting caused by stripping. As explained by Yin et al. (2014), there is a point where the curvature of the HWTT trace transitions from negative to positive. Yin et al. (2014) referred to this point as the *Stripping Number* (SN). The rut depth accumulated prior to the SN is comprised predominantly of viscoplastic deformation due to loading. The viscoplastic strain associated with this portion of the loading curve can be calculated as the ratio of the rut depth to the specimen thickness at any load cycle and then plotted for each load cycle. Yin et al. (2014), then used Tseng-Lytton (1989) model to fit this part of the curve and project an isolated viscoplastic response out to the termination of the test to establish the Corrected Rut Depth (CRD) curve. As stated previously, this method provides a means to distinguish the rutting in the HWTT due to viscoplastic deformation from that caused by moisture induced damage. Wen et al. (2016) developed the Rutting Resistance Index (RRI) for dealing with HWTT tests having different

test termination points. The RRI is a function of the maximum number of passes completed during test and the observed terminal rut depth. The equation for the RRI is:

$$RRI = N_{max} * (1 - RD)$$

Where: RRI = Rutting Resistance Index
N_{max} = Number of wheel passes at completion of the test
RD = Rut depth in inches at completion of the test

The RRI considers both the rut depth and the number of passes. For example, a mixture having a terminal rut depth of 0.5 inches (12.5 mm) at 10,000 passes exhibits an RRI of 5,000. Similarly, a mix with only 0.0625 inches (1.6 mm) at 20,000 passes has an RRI of 18,750. Higher values of RRI indicate better rutting performance.

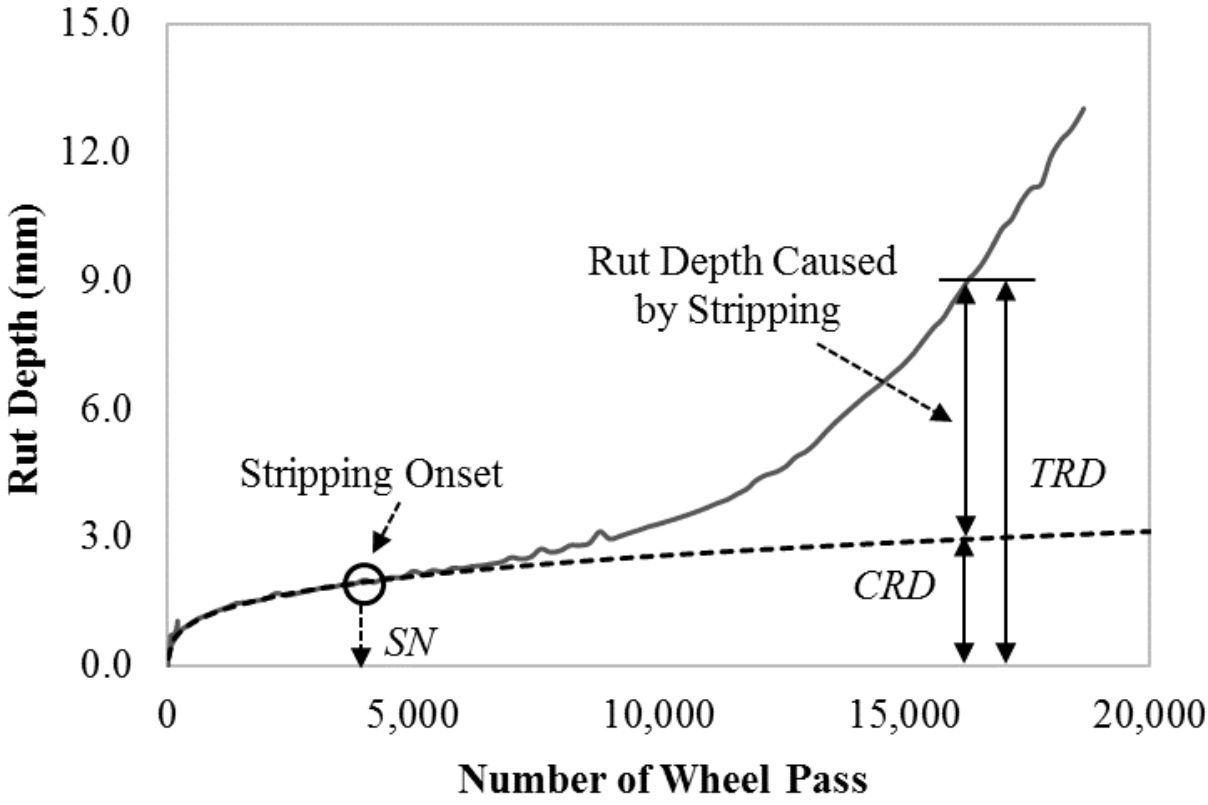


Figure 2.1 HWTT Analysis with Isolated Effects (Yin et al., 2014)

These analytical improvements have significantly improved the value of the HWTT as a rutting test. Moreover, the test reportedly has good correlation to field performance and moderate

variability. Significant disadvantages include high initial cost ($60k+), long test time (approximately 6.5 hours for 20,000 passes) and confounded stress state (NAPA, 2023).

The Flow Number (FN) is derived from an axial compression test, which can involve confining pressure if desired. The test has been standardized as AASHTO T 378. According to NAPA (2023), field validations have reportedly been positive. However, the high initial cost ($100+), test complexity, high variability and inappropriateness for field applications make the FN less desirable as the rutting test of choice.

The Rapid Shear Rutting Test (Ideal-RT) was developed by Zhou et al. (2019). The test involves a shear fixture that is used in conjunction with a standard load frame. As a result, the test is simple relatively inexpensive ($10-$20k) with low variability (COV<10%) and positive field correlation thus far (NAPA, 2023). The test is also suitable for production facility application for QC/QA testing.

2.4 Cracking Tests

For cracking tests, one must determine the particular pavement distress to be considered as there are cracking tests intended for assessing low temperature cracking susceptibility as well as load associated (i.e., fatigue) cracking. Newcomb (2018) and the NAPA BMD Resource Guide (2023) provide excellent descriptions of the low temperature cracking tests. These are not presented here for the following reason. Low temperature cracking is addressed via the binder grade specified for a given project since applied tensile stresses are carried by the binder and the adhesion of the binder to the aggregate. Therefore, a measure (arguably predominant) of low temperature cracking abatement is provided by binder testing and grading.

Tests for assessing fatigue cracking resistance include the Illinois Flexibility Index Test (I-Fit), Indirect Tensile Asphalt Cracking Test (Ideal-CT), Overlay Test (OT) and N_{flex} Factor. All of these save for the OT use monotonic loading and as such provide a relationship with fatigue cracking. As with the previous rutting and cracking tests, the NAPA BMD Resource Guide provides excellent summary information regarding these fatigue tests.

The I-Fit test involves a semi-circular specimen and a simple support fixture used with a standard load frame. The standard test method is AASHTO T 393. The test reportedly has good correlation with field performance. However, multi-step specimen preparation and high variability make it less attractive compared to the alternatives.

The Ideal-CT test involves a circular specimen and indirect tensile test fixture used with a standard load frame. The standard test method is ASTM D 8225. The test reportedly has moderate variability (10-25% COV) according to the NAPA BMD Resource Guide. Field validation observations have also been good for pavement test sections in Texas, at the FHWA Accelerated Loading Facility, as well as NCAT and MnROAD pavement test facilities. While the Ideal-CT can be readily used for QC/QA testing, it should be noted that test reproducibility (i.e., between lab variability) can be questionable.

The OT involves a trimmed specimen glued to a set of plates. One of these plates is fixed while the other moves to produce loading. The test is standardized in the two states in which it is currently used (i.e., NJ and TX). The test reportedly has good correlation with field performance.

However, high equipment cost, multi-step specimen preparation and high variability make it less attractive compared to the alternatives.

The N_{flex} Factor test involves a circular specimen and indirect tensile test fixture used with a standard load frame similar to the Ideal-CT test. The standard test method is AASHTO TP 141. The test reportedly has fair correlation with field performance with moderate variability. It can also be readily used for QC/QA testing.

2.5 Moisture Damage Susceptibility Testing

Moisture damage susceptibility testing is an important consideration for asphalt mixtures. Newcomb (2018) provides description current moisture damage tests including AASHTO T 283 and AASHTO T 324. Currently TDOT essentially uses a form of ASTM D 4867 for this assessment without a freeze-thaw (F/T) cycle as prescribed by AASHTO T 283. Moreover, the specimen saturation range is not as severe for ASTM D 4867. Consideration should be given to the use of AASHTO T 283 in an effort to reduce test variability.

Since HWTT testing is conducted in a water bath, moisture damage assessment can be made using the stripping metrics described in AASHTO T 324. These include the Stripping Inflection Point (SIP) as shown in Figure 2.2. As previously stated, a perceived disadvantage of using the HWTT for rutting assessment is the confounded stress state caused by test temperature control using a water bath. The total deformation observed during the test is the combination of viscoplastic and moisture damage effects. Yin et al. (2014) presented a novel method for separating these effects and defined both rutting and stripping metrics. Testing in a water bath to control the test temperature was once thought a liability since the distress state is confounded and the permanent deformation attributable to the combined effects of plastic deformation and moisture damage induced deformation. However, the HWTT stripping metrics are a bonus.

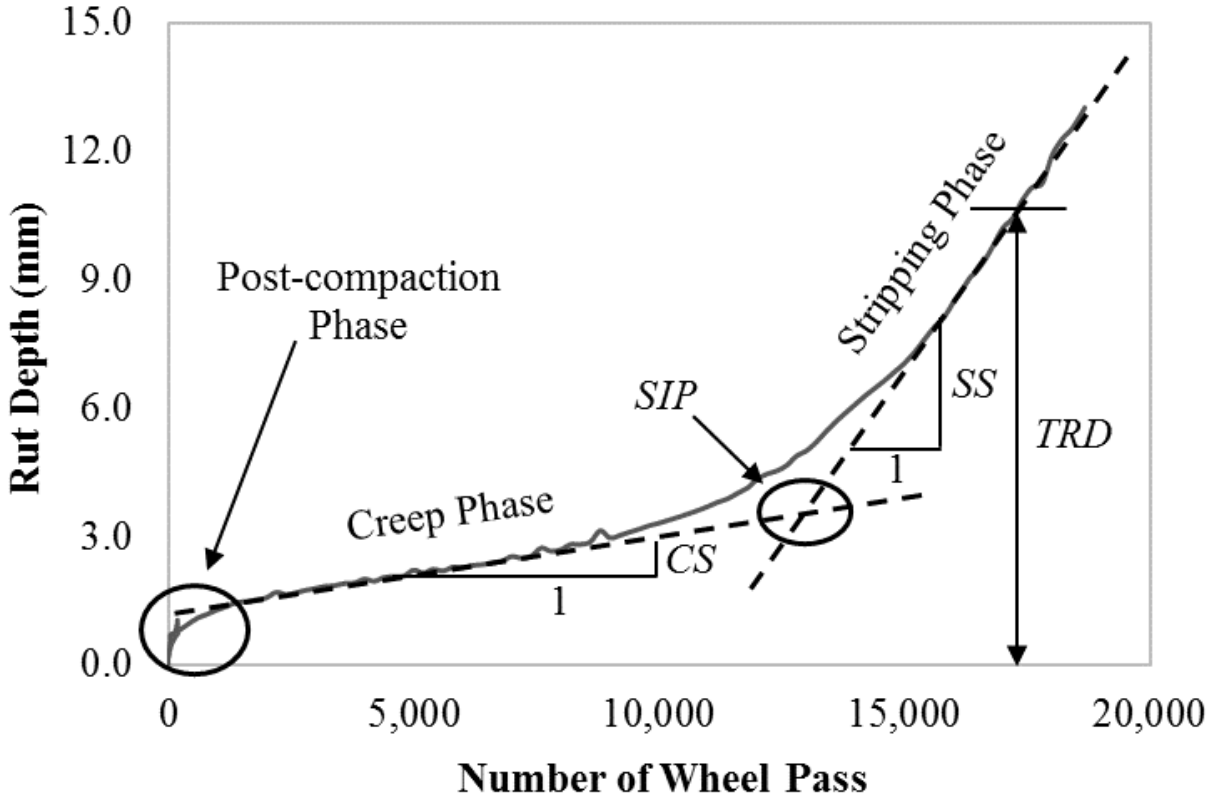


Figure 2.2 HWTT Data Analysis (Yin et al., 2020)

2.6 Summary & Recommendations

For this study, HWTT, Ideal-RT and Ideal-CT were selected based on a number of factors including correlation to field performance, equipment availability, specimen geometry and ease of fabrication, design and production testing applicability, relative cost, and test precision (i.e., low to moderate variability). Mixture aging was beyond the scope of this project; however, laboratory prepared mixtures were aged in accordance with AASHTO standard procedures associated with the respective test. For HWTT and Ideal-RT, mixtures were aged for two (2) hours at the compaction temperature prior to compaction. For Ideal-CT, the aging time was increased to four (4) hours at the compaction temperature prior to compaction.

Chapter 3 Methodology

3.1 Experimental Design and Objectives

Characterization of laboratory prepared specimens of current TDOT mixtures using BMD tests/responses provided benchmarking of these existing mixtures which per the NCHRP20-7 report is one of the first steps toward development of a BMD mix design framework. Specific objectives identified for the experimental design included the following:

1. Comparison of the HWTT and Ideal-RT rutting resistance metrics.
2. Comparison of the HWTT stripping assessment metrics.
3. Comparison of the Ideal-CT Index.
4. Variability assessment for each test metric insofar as possible.

3.2 Materials and Tests

3.2.1 Laboratory Prepared Mixtures

The proposed laboratory mixture experimental matrix included:

1. Four (4) mix types to be determined by TDOT (e.g., "A", "BM2", "CS", "D/TL/TLD" and "E") including recycle where relevant and applicable.
2. Two (2) aggregate mineral types (e.g., gravel, limestone, granite)
3. Unmodified and modified binder (surface mixtures only)
4. Three (3) binder contents (volumetrically determined optimum, $P_{b(opt)}$, $P_{b(opt)-0.5}$ and $P_{b(opt)+0.5)}$

This experimental testing matrix resulted in 36 mixture combinations for laboratory testing (4+2=6 mix/binder types X 2 aggregate mineral types X 3 binder contents = 36). In addition to laboratory prepared mixtures, tests conducted on cores extracted from in-service roadway sections were to be used to investigate oxidative stiffening effects, particularly for cracking assessment tests.

Characterization of current TDOT mixtures using the prospective BMD tests/responses was revised and included the following:

1. Two (2) mix types ("BM2" and "D") involving four (4) "BM2" and five (5) "D" mixes for a total of 36 different mixtures.
2. Two (2) aggregate mineral types (gravel and limestone)
3. Unmodified and modified binder (PG 64-22 and PG 76-22)
4. Reclaimed Asphalt Pavement (RAP) at two (2) different levels (Actual percentages of RAP were varied depending on the mix type.)
5. Two (2) binder contents (volumetrically determined optimum, $P_{b(opt)}$ and $P_{b(opt)+0.5)}$.

This new experimental testing matrix resulted in 36 mixture combinations for laboratory testing (mix type/binder type/binder content/RAP). The revised laboratory testing matrix is shown

in Table 3.1. For each row of Table 3.1, two (2) mixes are represented. Odd numbers represent the JMF optimum binder content while even numbers represent the JMF optimum binder plus 0.5% additional asphalt. For example, Mix No. 1 involved TDOT JMF No. 2190099 "as is" whereas Mix No. 2 involved JMF No. 2190099 with 0.5% additional PG 64-22 binder. Similarly, Mix No. 3 involved TDOT JMF No. 2190101 "as is" whereas Mix No. 4 involved JMF No. 2190101 with 0.5% additional PG 64-22 binder.

Mixture gradation and optimum binder content for each mixture are shown in Tables 3.2 and 3.3. Note that in some cases two JMF numbers are shown. These are instances where the PG 64-22 and PG 76-22 mixtures either differed or were issued under different JMF numbers. Each JMF is shown in Appendix A.

TABLE 3.1 BMD STUDY MIXTURE MATRIX

Mix No.	*Mix ID*	*Mix Type*	*TDOT JMF No.*	*Mix Code*	*Aggregate*	*Binder*
1&2	D1	D	2190099	SE6	Limestone	64-22
3&4	D1	D	2190101	SE7	Limestone	76-22
5&6	D2	D	3190178	RGD6	Limestone	64-22
7&8	D2	D	3190180	RGD7	Limestone	76-22
9&10	D3	D	1190325	BA6	Gravel	64-22
11&12	D3	D	1190325	BA7	Gravel	76-22
13&14	D4	D	4190198	DC6	Gravel	64-22
15&16	D4	D	4190198	DC7	Gravel	76-22
17&18	B1	BM2	4190018	LR6	Limestone	64-22
19&20	B1	BM2	4190018	LR7	Limestone	76-22
21&22	B2	BM2	3190049	RG6	Limestone	64-22
23&24	B2	BM2	3190049	RG7	Limestone	76-22
25&26	B3	BM2	4190152	SC6	Gravel	64-22
27&28	B3	BM2	4190152	SC7	Gravel	76-22
29&30	B4	BM2	1190378	ST6	Gravel	64-22
31&32	B4	BM2	1190380	ST7	Gravel	76-22
35&36	D5	D	3190208	VH6	Limestone	64-22
37&38	D5	D	3190208	VH7	Limestone	76-22

**Mix number designations per the revised test plan use a unique mix design serial number for each binder content on an odd/even basis (e.g., Mix #1 is at 'JMF Optimum AC' whereas Mix #2 is at 'JMF Optimum AC + 0.5%).*

**Shaded rows indicate mixes for which field core data exists.*

TABLE 3.2 BMD STUDY "BM2" MIXTURE GRADATIONS (CUM. %PASSING)

Sieve	*B1 (4190018)*	*B2 (3190049)*	*B3 (4190152)*	*B4 (1190378) (1190380)*
1.25"	100	100	100	100
3/4"	93	93	93	92
3/8"	60	72	71	67
No.4	43	51	54	53
No.8	32	39	41	35
No.30	19	24	25	16
No.50	10	12	12	11
No.100	6.1	7.2	7.0	8.1
No.200	4.4	5.5	5.3	6.3
AC%	4.3	4.2	4.8	4.5

TABLE 3.3 BMD STUDY "D" MIXTURE GRADATIONS (CUMULATIVE %PASSING)

Sieve	*D1 (2190099) (2190101)*	*D2 (3190178) (3190180)*	*D3 (1190325)*	*D4 (4190198)*	*D5 (3190208)*
5/8"	100	100	100	100	100
3/4"	99	98	100	98	97
3/8"	90	90	91	89	86
No.4	57	69	58	71	64
No.8	42	52	41	51	46
No.30	28	29	22	28	25
No.50	16	14	13	14	12
No.100	8.8	8.1	7.4	8.6	8.1
No.200	5.8	6.5	4.5	6.0	6.0
AC%	5.7	5.8	5.8	6.0	5.7

Per the April 16, 2019, meeting, permanent deformation tests selected included: 1) Hamburg Wheel Tracking Test with water temperature control ($HWTT_{water}$), and 2) Ideal Rutting Test (Ideal-RT). Cracking tests selected included: 1) Ideal Cracking Test (Ideal-CT), and 2) N_{flex} Test. However, the N_{flex} Test lacked a standard procedure at the time of testing so only the Ideal-CT test was performed for assessing cracking resistance. Likewise, conducting HWTT both in air and water was thought to provide perspective regarding moisture damage in addition to the proposed stripping metric responses obtained from the $HWTT_{water}$. However, considering the increased number of mixtures tested, only HWTT in water was performed. This still provided stripping assessment metrics in addition to rutting resistance evaluation. Each of these tests and metrics derived from them was presented in Chapter 2. Two (2) replicates of HWTT were performed while four (4) replicates each for Ideal-RT and Ideal-CT were tested.

Response variables/metrics for each of these tests were as follows:

- Hamburg Wheel Tracking Test (HWTT)
  - Rutting Resistance Index (RRI)
  - Corrected Rut Depth (CRD)
  - Stripping Inflection Point (SIP) (411-D mixtures only)
  - Stripping Number (SN) (411-D mixtures only)
- Rapid Shear Rutting Test (Ideal-RT)
  - RT_{Index}
- Ideal Cracking Test (Ideal-CT)
  - CT_{Index}

Mixture rutting, cracking and moisture damage performance assessments were conducted using these metrics as the basis of comparison and as means to establish a benchmark value for each mixture combination.

3.2.2 Field Cores

Since completion of the original Tasks 5 and 6 involving correlations of the laboratory test results with field performance data was not possible and since the relationship between the laboratory test data and field performance data was strongly desired and essential to the assessment of the BMD tests, some means of evaluating the relationship was deemed necessary. To address this, 3 JMFs were identified as representative for the respective east, middle and west regions of the state. Twelve (12) projects were then chosen for which there was significant confidence that the projects were paved with one of the selected JMFs. More specifically, three (3) projects were chosen that were associated with the east and west regions of the state while six (6) projects were chosen for the middle Tennessee JMF. These 12 projects were cored, and the upper surface layer(s) were tested to assess cracking performance with respect to the laboratory cracking resistance testing. Since these pavements were approximately 5 years old and exhibiting little to no permanent deformation, it was believed that rut testing was at this point of little value and hence the focus on cracking performance comparisons. Field core information and photographs are shown in Appendix B.

Chapter 4 Results and Discussion

According to the revised task goals and scope of work, the key motivations for this research were to:

1. Conduct laboratory BMD tests of 36 representative TDOT mixtures.
2. Establish BMD benchmarks for these mixtures.
3. Compare/contrast the BMD data with the goal of establishing limiting criteria.
4. Establish a correlative link between laboratory cracking performance testing of laboratory prepared mixtures and field cores.

All collected and compiled performance data presented in this chapter are shown in Appendix C. The following sections show summaries of the respective response variables that warranted comment.

4.1 Rutting Resistance Assessments

4.1.1 Hamburg Wheel Tracking Test (HWTT)

Table 4.1 and Figure 4.1 show the HWTT Rutting Resistance Indices for the 411-D mixes. Recall, the RRI value provides a means to address HWTT tests having different termination points. Figure 4.1 shows expected trends where the PG 76-22 mixes significantly outperformed the PG 64-22 counterparts. Similarly, more rutting was observed for the 0.5% increased binder content. In some cases, this was significant such as Mixture D3 with PG 76-22. It should be noted that typical specifications for HWTT vary with respect to the binder used in the mix. While the terminal maximum rut depth is 0.5 inch (12.5 mm), the minimum number of wheel passes is 10,000 in 20,000 for PG 64-22 and PG 76-22 respectively. In terms of RRI, the criteria become minimum RRI of 5,000 passes and 10,000 for PG 64-22 and PG 76-22 respectively. Table 4.1 and Figure 4.1 show that only one PG 64-22 mix (D1 @ Opt) had an RRI greater than 5,000 passes. In contrast, all but one of the PG 76-22 mixtures (D3 @ Opt+0.5%) exceeded an RRI of 10,000 passes. From a BMD perspective, the results for the PG 76-22 mixtures indicate that additional binder could be incorporated to promote increased cracking resistance performance if warranted. This is not the case with the PG 64-22 mixes as a whole. However, it must be noted that the RRI involves the total rut depth which could involve substantial rutting due to stripping induced strain. It must also be noted that Tennessee does not have a prevalent rutting problem system wide. Probably the best explanation for these results then has to do with a significant amount of stripping induced permanent deformation. Table 4.2 shows the Corrected Rut Depth (CRD) measurements. Recall, the CRD reflects only the viscoplastic portion of the deformation experienced in the HWTT as shown in Figure 2.1. The CRD values shown Table 4.2 and the chart of these data shown in Figure 4.2 suggest that all of the 411-D mixtures tested, both with PG 64-22 and PG 76-22, were rut resistant with a maximum CRD of approximately 8.0 mm. CRD results tend to better reflect the rutting performance of TDOT mixtures. That stated, they also confirm the notion that stripping may be a concern despite the mandated use of liquid anti-strips. From a BMD perspective, these data suggest that additional binder to promote cracking resistance is possible

if it were desired. Lastly, the Coefficient of Variation ranged from essentially zero to upwards of 76% which suggests that additional replication is warranted when conducting HWTT testing.

The BM2 data shown in Tables 4.3 and 4.4 along with the charts of these data shown in Figures 4.3 and 4.4 indicate significant rut resistance with all of the BM2 mixtures. Both PG 64-22 and PG 76-22 mixes exhibited an RRI greater than 10,000 passes. It must be noted that the HWTT was more specifically designed for surface mixtures where the stress intensity at the wearing surface is the greatest. Still, a similarly robust CRD response was also observed for the BM2 mixtures along with lower variability compared to the 411-D mixtures. From a BMD perspective, it appears additional binder is possible to promote increased cracking resistance of the BM2 mixtures should it be deemed warranted.

TABLE 4.1 HAMBURG WHEEL TRACKING TEST RESULTS FOR 411-D MIXTURES - RUTTING RESISTANCE INDEX (RRI)

Mix ID	*Rutting Resistance Index (RRI)*		*Average*	*Std. Dev.*	*Coeff. of Variation (%)*
D1-64 (Opt)	8324	3326	5825	3534	60.7
D1-64 (Opt+0.5%)	2951	3664	3308	504	15.2
D1-76 (Opt)	17939	17852	17896	62	0.3
D1-76 (Opt+0.5%)	15687	16222	15955	378	2.4
D2-64 (Opt)	3165	3198	3182	23	0.7
D2-64 (Opt+0.5%)	2947	1426	2187	1076	49.2
D2-76 (Opt)	16646	16565	16606	57	0.3
D2-76 (Opt+0.5%)	14433	16031	15232	1130	7.4
D3-64 (Opt)	2342	2443	2393	71	3.0
D3-64 (Opt+0.5%)	3165	1327	2246	1300	57.9
D3-76 (Opt)	4985	16553	10769	8180	76.0
D3-76 (Opt+0.5%)	3658	3194	3426	328	9.6
D4-64 (Opt)	4308	3871	4090	309	7.6
D4-64 (Opt+0.5%)	3143	3168	3156	18	0.6
D4-76 (Opt)	15427	17994	16711	1815	10.9
D4-76 (Opt+0.5%)	14939	17781	16360	2010	12.3
D5-64 (Opt)	3188	4004	3596	577	16.0
D5-64 (Opt+0.5%)	2688	3412	3050	512	16.8
D5-76 (Opt)	17710	16860	17285	601	3.5
D5-76 (Opt+0.5%)	16324	16687	16506	257	1.6

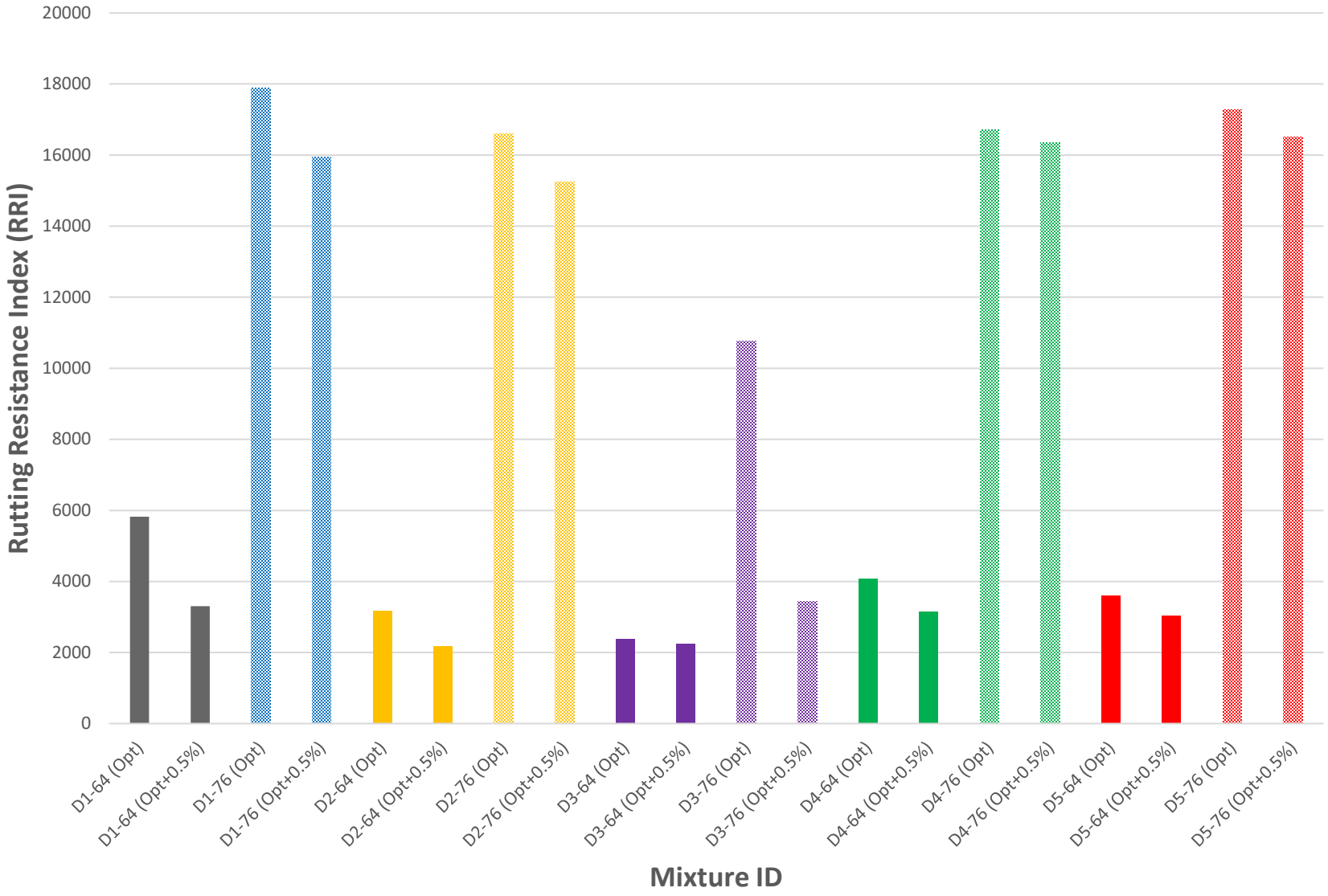


Figure 4.1 Hamburg Wheel Tracker Results for 411-D Mixtures – Rutting Resistance Index

TABLE 4.2 HAMBURG WHEEL TRACKING TEST RESULTS FOR 411-D MIXTURES - CORRECTED RUT DEPTH (CRD)

Mix ID	*CRD @ 20,000 passes (mm)*		*Average (mm)*	*Std. Dev. (mm)*	*Coeff. of Variation (%)*
D1-64 (Opt)	3.93	7.21	5.57	2.32	41.6
D1-64 (Opt+0.5%)	7.94	8.20	8.07	0.18	2.3
D1-76 (Opt)	2.58	2.47	2.53	0.08	3.1
D1-76 (Opt+0.5%)	4.00	3.53	3.77	0.33	8.8
D2-64 (Opt)	8.24	5.15	6.70	2.18	32.6
D2-64 (Opt+0.5%)	6.18	9.23	7.71	2.16	28.0
D2-76 (Opt)	3.90	4.17	4.04	0.19	4.7
D2-76 (Opt+0.5%)	3.88	4.67	4.28	0.56	13.1
D3-64 (Opt)	3.95	6.00	4.98	1.45	29.1
D3-64 (Opt+0.5%)	8.25	7.94	8.10	0.22	2.7
D3-76 (Opt)	4.91	3.83	4.37	0.76	17.5
D3-76 (Opt+0.5%)	3.99	4.61	4.30	0.44	10.2
D4-64 (Opt)	4.49	4.73	4.61	0.17	3.7
D4-64 (Opt+0.5%)	5.48	5.15	5.32	0.23	4.4
D4-76 (Opt)	3.06	2.44	2.75	0.44	15.9
D4-76 (Opt+0.5%)	3.91	2.71	3.31	0.85	25.6
D5-64 (Opt)	6.81	6.28	6.55	0.37	5.7
D5-64 (Opt+0.5%)	8.62	6.38	7.50	1.58	21.1
D5-76 (Opt)	2.95	3.85	3.40	0.64	18.7
D5-76 (Opt+0.5%)	4.65	3.99	4.32	0.47	10.8

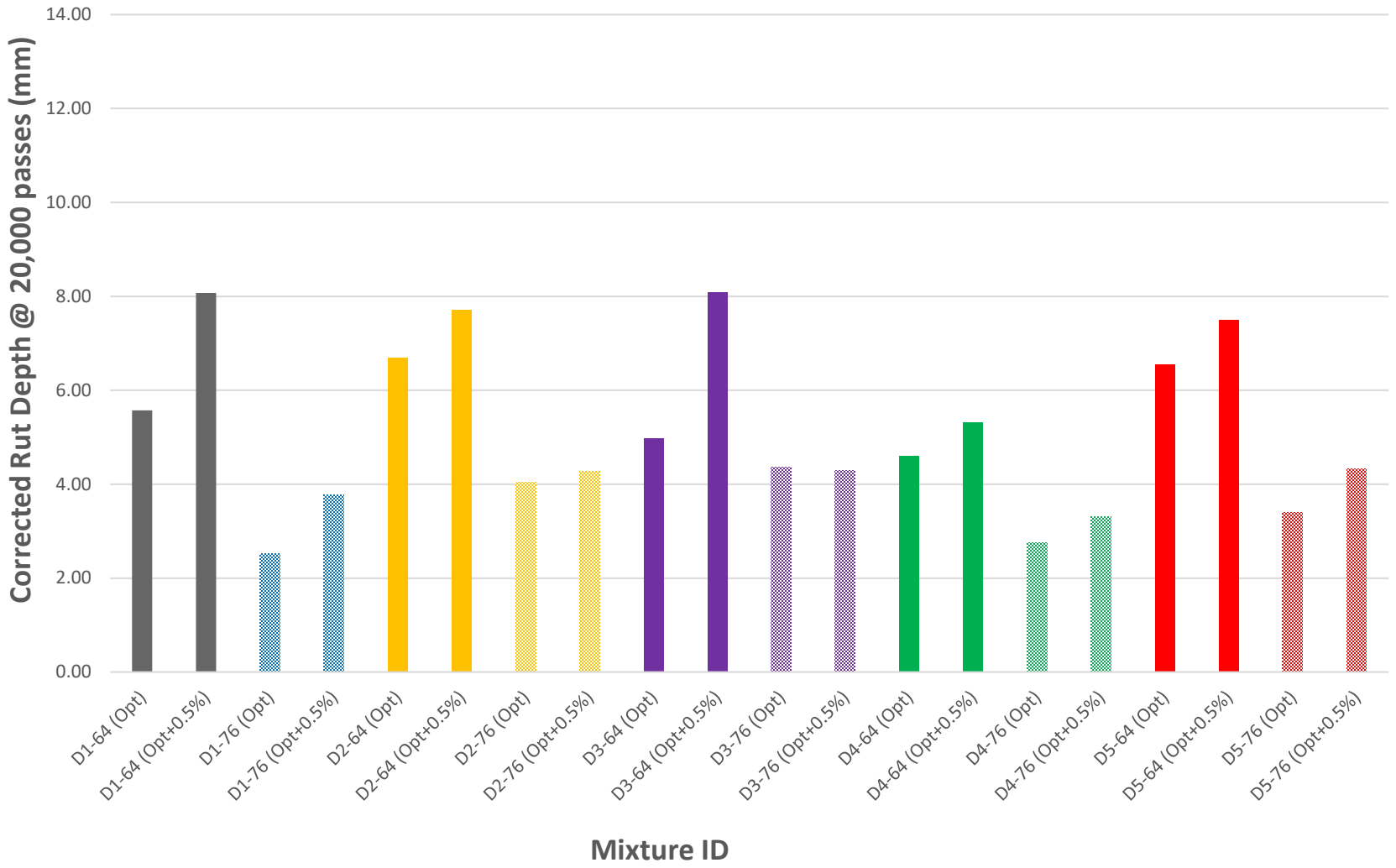


Figure 4.2 Hamburg Wheel Tracker Results for 411-D Mixtures – Corrected Rut Depth Method

TABLE 4.3 HAMBURG WHEEL TRACKER TEST RESULTS FOR BM2 MIXTURES - RUTTING RESISTANCE INDEX (RRI)

Mix ID	*Rutting Resistance Index (RRI)*		*Average*	*Std. Dev.*	*Coeff. of Variation (%)*
B1-64 (Opt)	17529	15899	16714	1153	6.9
B1-64 (Opt+0.5%)	14868	13938	14403	658	4.6
B1-76 (Opt)	17545	17332	17439	151	0.9
B1-76 (Opt+0.5%)	17514	17488	17501	18	0.1
B2-64 (Opt)	19369	17776	18573	1126	6.1
B2-64 (Opt+0.5%)	16884	18305	17595	1005	5.7
B2-76 (Opt)	19090	18445	18768	456	2.4
B2-76 (Opt+0.5%)	19057	19049	19053	6	0.0
B3-64 (Opt)	17718	17947	17833	162	0.9
B3-64 (Opt+0.5%)	14939	16679	15809	1230	7.8
B3-76 (Opt)	16671	17395	17033	512	3.0
B3-76 (Opt+0.5%)	17120	17017	17069	73	0.4
B4-64 (Opt)	15025	16380	15703	958	6.1
B4-64 (Opt+0.5%)	15844	9662	12753	4371	34.3
B4-76 (Opt)	18025	18561	18293	379	2.1
B4-76 (Opt+0.5%)	15883	17923	16903	1442	8.5

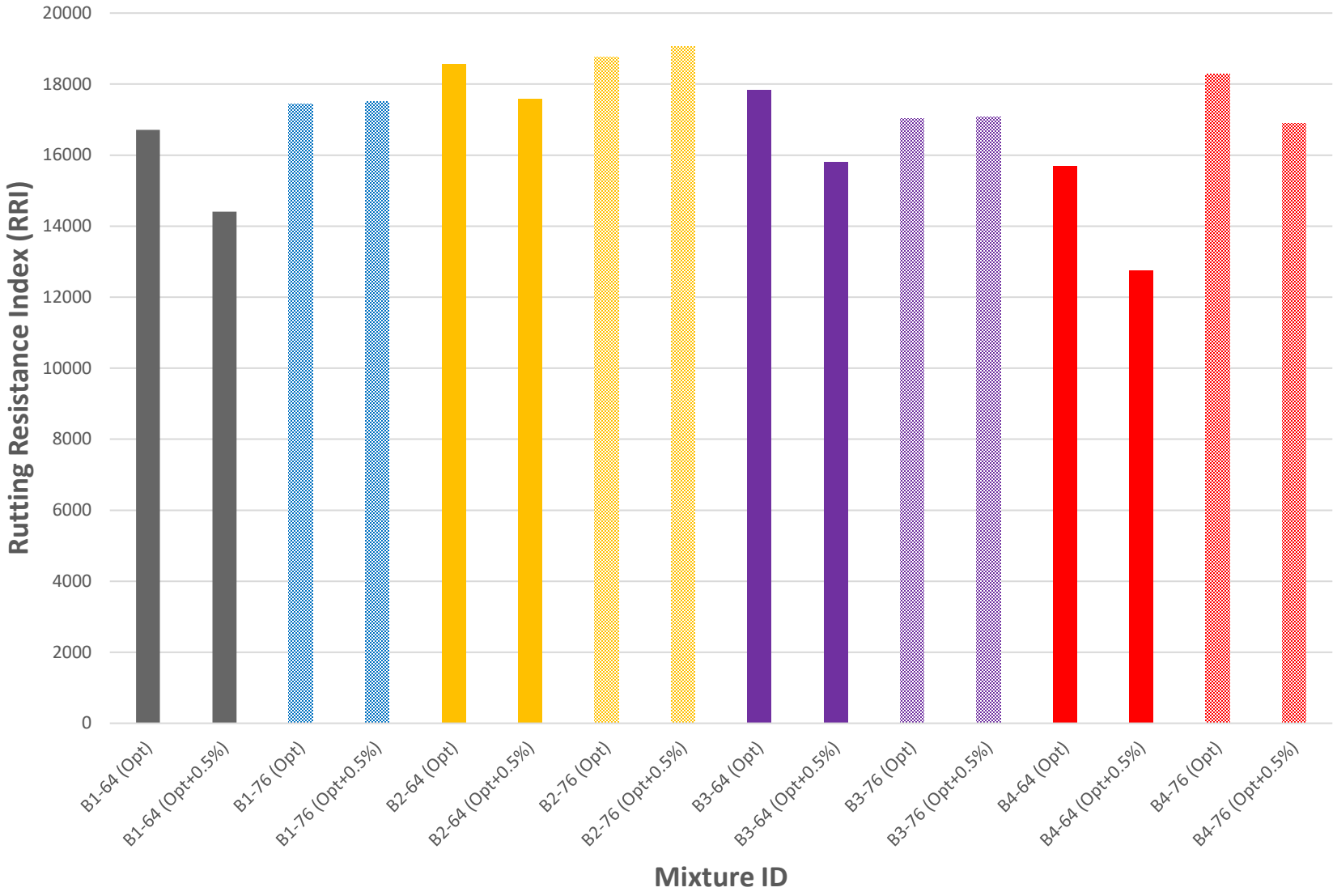


Figure 4.3 Hamburg Wheel Tracker Results for 307-BM2 Mixtures – Rutting Resistance Index

TABLE 4.4 HAMBURG WHEEL TRACKER TEST RESULTS FOR BM2 MIXTURES - CORRECTED RUT DEPTH (CRD)

Mix ID	*CRD @ 20,000 passes (mm)*		*Average (mm)*	*Std. Dev. (mm)*	*Coeff. of Variation (%)*
B1-64 (Opt)	3.16	5.23	4.20	1.46	34.9
B1-64 (Opt+0.5%)	6.41	7.72	7.07	0.93	13.1
B1-76 (Opt)	3.20	3.42	3.31	0.16	4.7
B1-76 (Opt+0.5%)	3.21	3.31	3.26	0.07	2.2
B2-64 (Opt)	1.93	3.67	2.80	1.23	43.9
B2-64 (Opt+0.5%)	4.94	3.20	4.07	1.23	30.2
B2-76 (Opt)	2.30	3.05	2.68	0.53	19.8
B2-76 (Opt+0.5%)	2.34	2.32	2.33	0.01	0.6
B3-64 (Opt)	3.07	2.60	2.84	0.33	11.7
B3-64 (Opt+0.5%)	6.24	4.16	5.20	1.47	28.3
B3-76 (Opt)	4.24	3.30	3.77	0.66	17.6
B3-76 (Opt+0.5%)	3.68	3.69	3.69	0.01	0.2
B4-64 (Opt)	4.54	4.54	4.54	0.00	0.0
B4-64 (Opt+0.5%)	5.11	5.11	5.11	0.00	0.0
B4-76 (Opt)	1.89	1.89	1.89	0.00	0.0
B4-76 (Opt+0.5%)	5.19	2.60	3.90	1.83	47.0

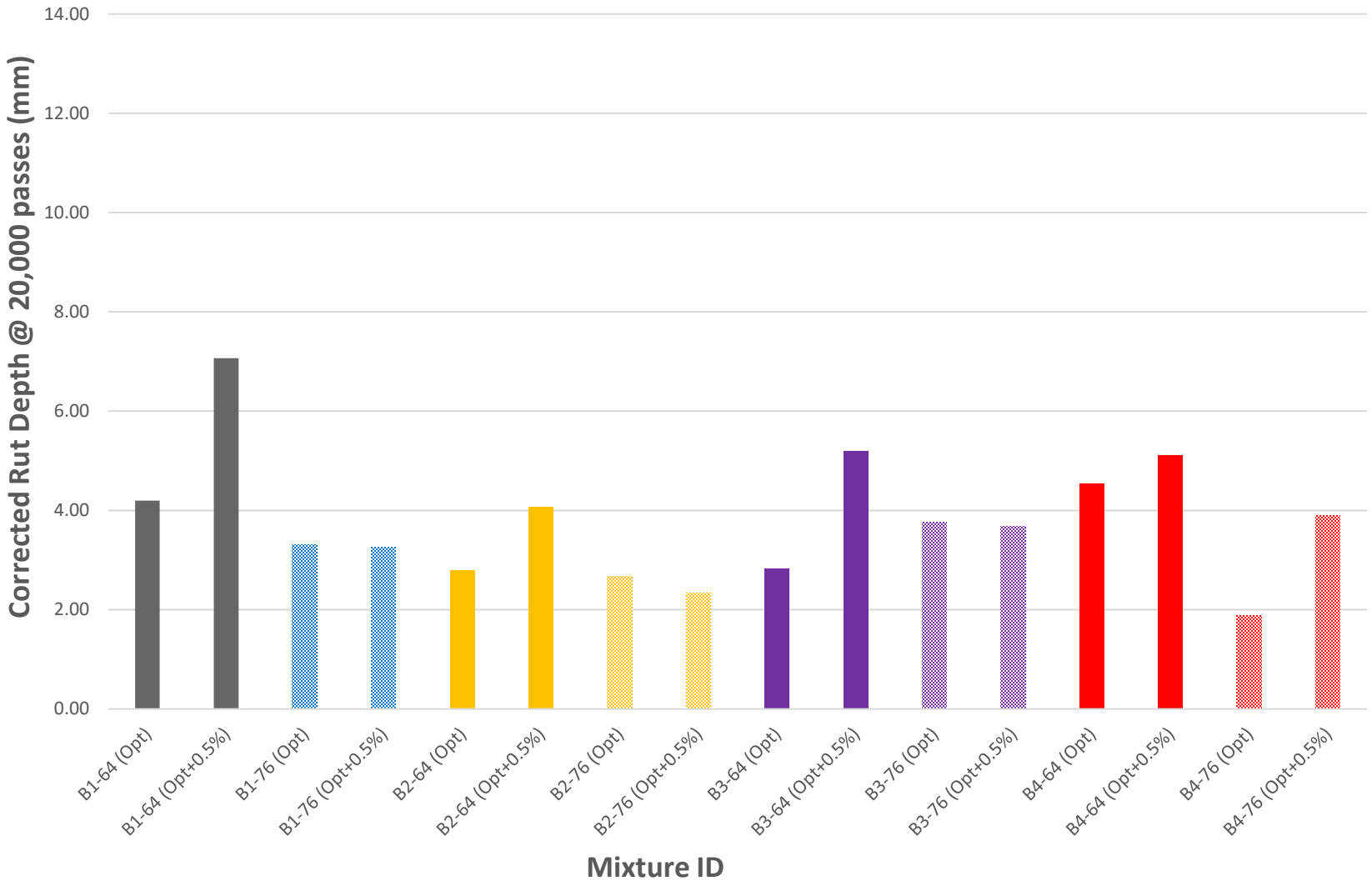


Figure 4.4 Hamburg Wheel Tracker Results for 307-BM2 Mixtures – Corrected Rut Depth Method

4.1.2 Rapid Shear Rutting Test (Ideal-RT)

Tables 4.5 and 4.6 along with Figures 4.5 and 4.6 show the Ideal-RT Rutting Tolerance Indices (RT_{Index}) for the 411-D and 307-BM2 mixtures respectively. The first noticeable aspect of these data is the significantly lower variability compared to the HWTT. This coupled with the lower equipment cost, ease, and portability of test, as well as the speed of testing make for a solid BMD test candidate. The challenge with these data is that there does not seem to be a clear performance threshold. If one considers that all of the mixes were considered rut resistant according to the HWTT, then a plausible threshold might be 25 for PG 64-22 mixes and 50 for PG 76-22 mixes. However, neither of these values align with the limits proposed by Zhou (2021) in the NCHRP 20-44(16) final report where he proposed a minimum RT_{Index} value of 58 for PG 64-22 mixtures and a minimum value of 75 for PG 76-22 mixtures.

TABLE 4.5 IDEAL-RT RUTTING TOLERANCE INDEX (RT_{INDEX})FOR 411-D MIXTURES

Mix ID	*Rutting Tolerance Index, RT_{Index}*				*Average*	*Std. Dev.*	*Coeff. of Variation (%)*
D1-64 (Opt)	67.02	72.38	71.28	73.06	70.94	2.71	3.8
D1-64 (Opt+0.5%)	53.54	51.34	55.00	56.82	54.18	2.32	4.3
D1-76 (Opt)	104.63	91.79	101.45	93.66	97.88	6.14	6.3
D1-76 (Opt+0.5%)	77.77	73.22	79.86	68.84	74.92	4.91	6.6
D2-64 (Opt)	44.25	41.88	39.57	70.87	49.14	14.61	29.7
D2-64 (Opt+0.5%)	33.75	31.66	28.54	31.97	31.48	2.17	6.9
D2-76 (Opt)	105.36	116.98	123.75	109.53	113.91	8.14	7.1
D2-76 (Opt+0.5%)	116.92	101.50	96.59	88.85	100.96	11.84	11.7
D3-64 (Opt)	28.15	29.68	41.57	47.77	36.79	9.46	25.7
D3-64 (Opt+0.5%)	33.87	34.66	33.99	30.67	33.30	1.78	5.4
D3-76 (Opt)	90.23	100.11	97.15	104.52	98.00	6.00	6.1
D3-76 (Opt+0.5%)	81.64	70.77	84.41	78.33	78.79	5.90	7.5
D4-64 (Opt)	85.96	76.62	68.22	77.46	77.07	7.25	9.4
D4-64 (Opt+0.5%)	59.40	77.46	63.92	83.68	71.12	11.36	16.0
D4-76 (Opt)	149.74	162.50	145.44	168.66	156.59	10.83	6.9
D4-76 (Opt+0.5%)	119.18	129.18	113.92	123.30	121.40	6.46	5.3
D5-64 (Opt)	21.80	29.91	25.02	26.56	25.82	3.37	13.1
D5-64 (Opt+0.5%)	28.90	26.14	35.48	43.28	33.45	7.64	22.8
D5-76 (Opt)	83.68	87.18	88.63	81.12	85.15	3.40	4.0
D5-76 (Opt+0.5%)	54.01	51.14	56.73	49.02	52.72	3.36	6.4

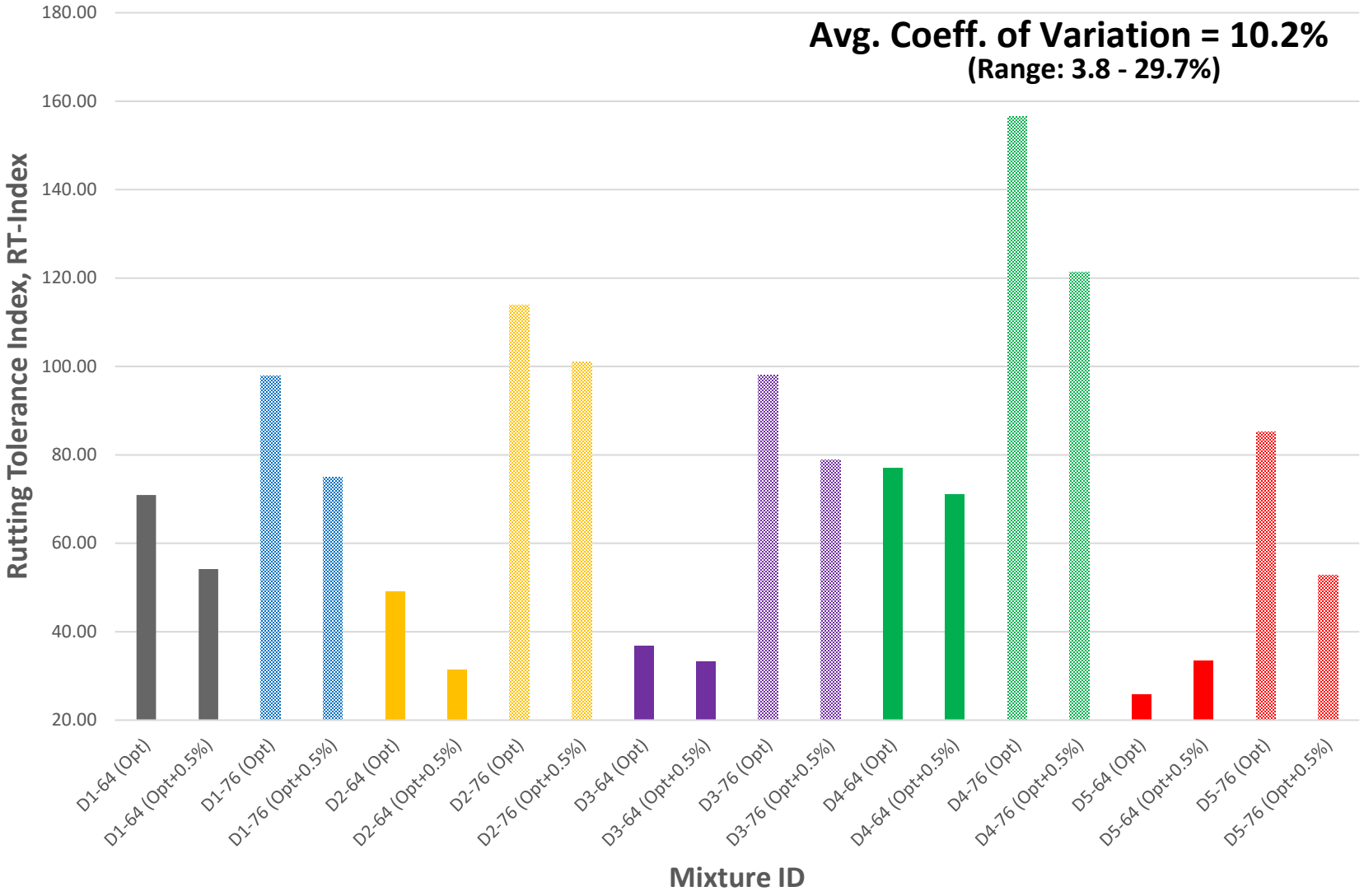


Figure 4.5 Rutting Tolerance Index (RT_{Index}) for 411-D Mixtures

TABLE 4.6 IDEAL-RT RUTTING TOLERANCE INDEX (RT_{INDEX}) FOR 307-BM2 MIXTURES

Mix ID	*Rutting Tolerance Index, RT_{Index}*				*Average*	*Std. Dev.*	*Coeff. of Variation (%)*
B1-64 (Opt)	55.08	51.50	52.70	53.42	53.18	1.50	2.8
B1-64 (Opt+0.5%)	37.39	37.86	41.49	*	38.91	2.24	5.8
B1-76 (Opt)	153.25	131.85	90.39	*	125.16	31.96	25.5
B1-76 (Opt+0.5%)	91.73	87.45	*	*	89.59	3.02	3.4
B2-64 (Opt)	55.58	77.52	81.82	69.98	71.23	11.52	16.2
B2-64 (Opt+0.5%)	60.98	53.18	74.62	58.08	61.72	9.19	14.9
B2-76 (Opt)	109.48	153.98	126.42	131.14	130.26	18.35	14.1
B2-76 (Opt+0.5%)	130.60	134.98	121.56	*	129.05	6.84	5.3
B3-64 (Opt)	106.52	87.96	100.28	137.98	108.19	21.31	19.7
B3-64 (Opt+0.5%)	61.78	69.26	71.36	68.88	67.82	4.17	6.2
B3-76 (Opt)	84.40	76.22	87.93	*	82.85	6.01	7.3
B3-76 (Opt+0.5%)	50.68	47.28	58.56	67.40	55.98	8.96	16.0
B4-64 (Opt)	81.18	89.44	41.22	36.28	62.03	27.17	43.8
B4-64 (Opt+0.5%)	74.80	81.26	*	*	78.03	4.57	5.9
B4-76 (Opt)	103.30	60.10	59.34	*	74.25	25.16	33.9
B4-76 (Opt+0.5%)	122.38	110.84	*	*	116.61	8.16	7.0

**Missing Data Point (specimen air voids exceeded 0.5% tolerance)*

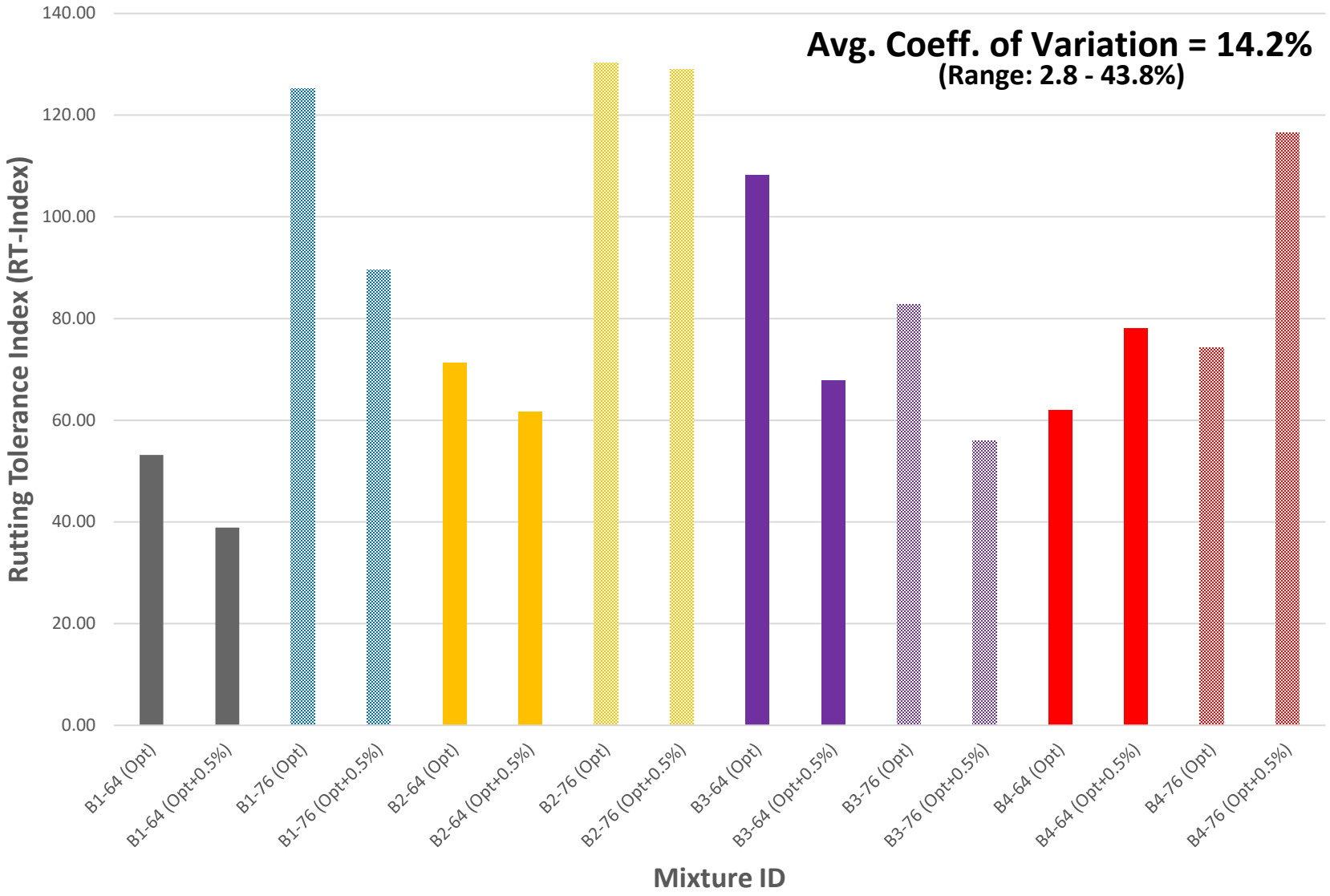


Figure 4.6 Rutting Resistance Index (RT_{Index}) for 307-BM2 Mixtures

4.2 Cracking Resistance Assessments

4.2.1 Indirect Tensile Asphalt Cracking Test (Ideal-CT)

Tables 4.7 and 4.8 along with Figures 4.7 and 4.8 show the Ideal-CT Cracking Indices (CT_{Index}) for the 411-D and 307-BM2 mixtures respectively. These data and especially the charts show the influence of increased binder content on the CT_{Index}. Aside from this, there does not seem to be a discernable separation threshold from which a specification criterion could be established. Mixes D2, D5 and B4 exhibited superior cracking resistance performance with both the PG 64-22 and PG 76-22. National guidelines provided by Zhou (2021) recommend a minimum CT_{Index} of 65 for dense graded mixtures like the ones tested in this study. Based on this criterion, all but 4 of the 411-D mixes and two-thirds of the 307-BM2 mixes would be considered crack resistant. Of course, one must consider that these specimens were only aged for 4-hours. Additional aging may be required to best represent field conditions and if so a corresponding reduction in CT_{Index} would be likely. From a BMD perspective, increased asphalt content should improve the mixes that were below the threshold.

TABLE 4.7 IDEAL-CT (CT_{INDEX}) FOR 411-D MIXTURES

Mix ID	*Ideal-CT, CT_{Index}*				*Average*	*Std. Dev.*	*Coeff. of Variation (%)*
D1-64 (Opt)	87.2	79.8	115.3	89.8	93.0	15.4	16.6
D1-64 (Opt+0.5%)	128.8	107.8	131.6	171.0	134.79	26.37	19.6
D1-76 (Opt)	39.7	60.5	44.8	32.2	44.29	12.01	27.1
D1-76 (Opt+0.5%)	127.0	82.8	105.1	111.6	106.6	18.3	17.2
D2-64 (Opt)	260.2	245.1	253.1	222.6	245.2	16.3	6.6
D2-64 (Opt+0.5%)	427.4	326.1	401.3	317.1	368.0	54.7	14.9
D2-76 (Opt)	140.0	288.0	182.8	232.5	210.8	63.9	30.3
D2-76 (Opt+0.5%)	341.9	418.2	317.5	377.0	363.7	43.8	12.0
D3-64 (Opt)	53.3	64.8	90.5	89.5	74.5	18.4	24.8
D3-64 (Opt+0.5%)	97.1	151.5	76.9	126.7	113.1	32.8	29.0
D3-76 (Opt)	132.2	99.3	87.6	94.0	103.3	19.9	19.2
D3-76 (Opt+0.5%)	138.9	129.0	159.9	111.6	134.9	20.2	15.0
D4-64 (Opt)	39.8	40.4	46.2	45.9	43.1	3.4	8.0
D4-64 (Opt+0.5%)	63.9	83.2	52.0	78.8	69.5	14.3	20.6
D4-76 (Opt)	26.7	34.3	24.4	22.6	27.0	5.2	19.1
D4-76 (Opt+0.5%)	33.5	63.7	30.8	42.8	42.7	14.9	34.9
D5-64 (Opt)	125.8	149.0	158.2	188.5	155.4	26.0	16.7
D5-64 (Opt+0.5%)	214.3	343.1	225.6	224.9	252.0	61.0	24.2
D5-76 (Opt)	137.8	135.4	177.8	132.4	145.8	21.4	14.7
D5-76 (Opt+0.5%)	342.0	237.4	357.3	303.0	309.9	53.4	17.2

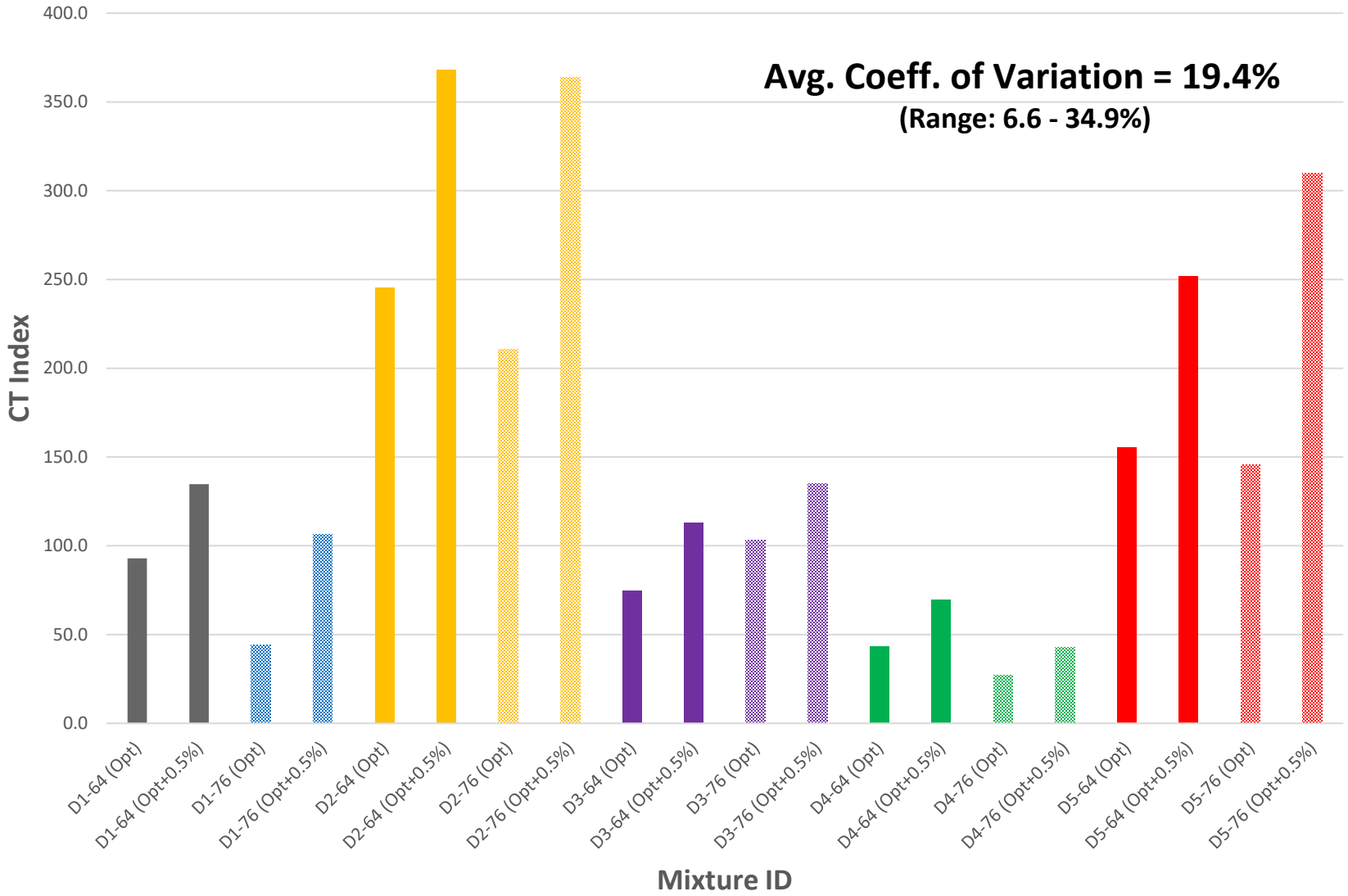


Figure 4.7 Ideal-CT (CT_{Index}) for 411-D Mixtures

TABLE 4.8 IDEAL-CT (CT_{INDEX}) FOR 307-BM2 MIXTURES

Mix ID	*Ideal-CT, CT_{Index}*				*Average*	*Std. Dev.*	*Coeff. of Variation (%)*
B1-64 (Opt)	85.6	74.1	73.0	75.1	76.9	5.8	7.6
B1-64 (Opt+0.5%)	179.1	140.5	132.2	88.8	135.15	37.03	27.4
B1-76 (Opt)	117.2	121.0	51.0	63.3	78.44	37.36	47.6
B1-76 (Opt+0.5%)	179.8	104.1	130.5	81.7	124.0	42.2	34.0
B2-64 (Opt)	36.2	51.8	23.7	24.2	34.0	13.2	38.9
B2-64 (Opt+0.5%)	39.9	100.6	87.8	94.1	80.6	27.6	34.3
B2-76 (Opt)	7.6	7.5	10.0	9.9	8.8	1.4	15.6
B2-76 (Opt+0.5%)	67.7	49.6	44.6	42.0	51.0	11.6	22.8
B3-64 (Opt)	20.9	66.8	34.5	40.4	40.7	19.3	47.4
B3-64 (Opt+0.5%)	60.0	56.2	42.4	66.8	56.4	10.3	18.2
B3-76 (Opt)	42.9	33.1	56.8	36.3	42.3	10.5	24.9
B3-76 (Opt+0.5%)	45.2	122.7	115.0	85.3	92.1	35.1	38.2
B4-64 (Opt)	171.8	176.2	227.5	156.8	183.1	30.8	16.8
B4-64 (Opt+0.5%)	167.5	327.4	374.9	135.7	251.4	117.6	46.8
B4-76 (Opt)	106.2	58.7	113.5	119.6	99.5	27.8	27.9
B4-76 (Opt+0.5%)	214.1	243.1	306.9		254.7	47.5	18.7
**Missing Data Point (specimen air voids exceeded 0.5% tolerance)*							

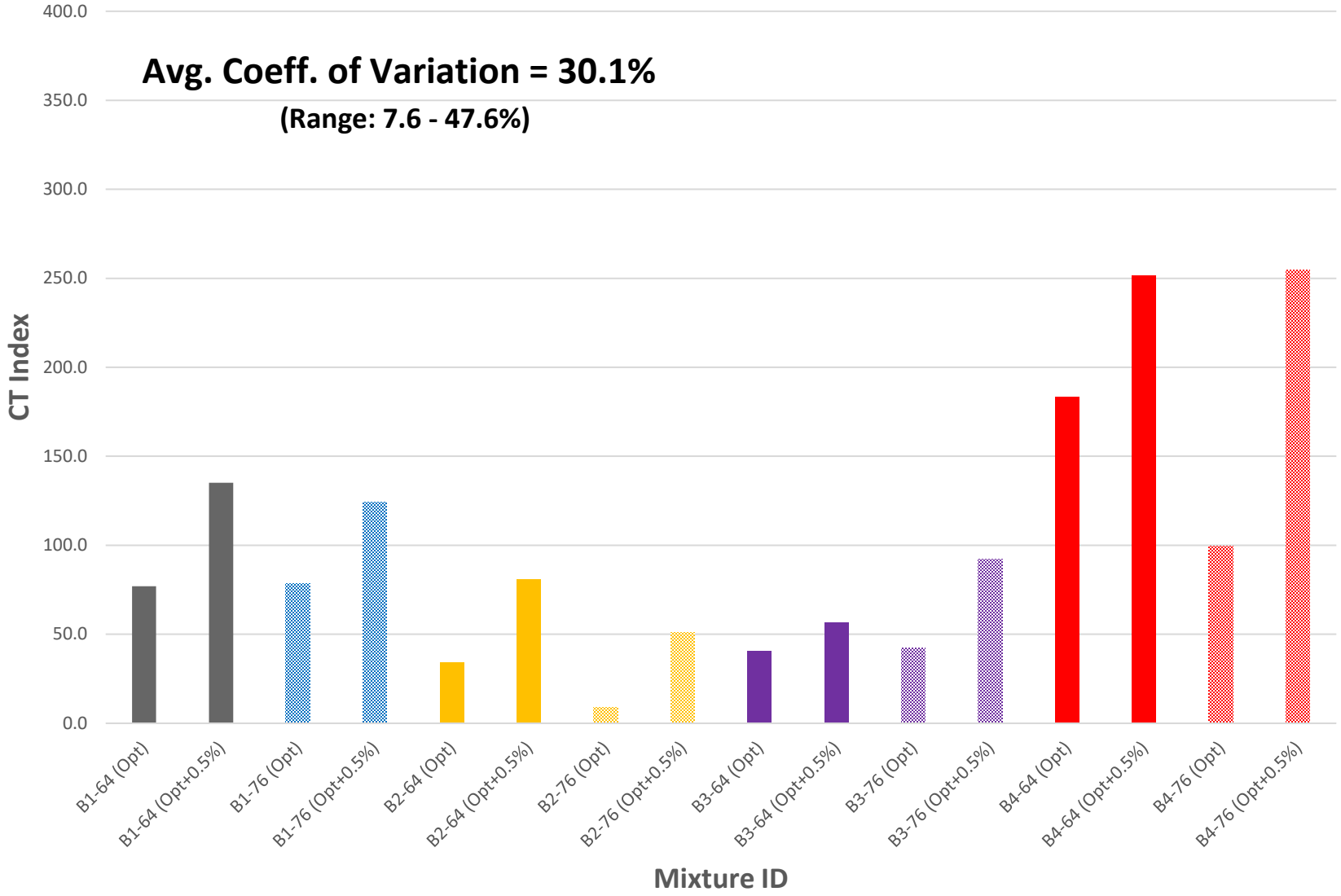


Figure 4.8 Ideal-CT (CT_{Index}) for 307-BM2 Mixtures

4.3 Moisture Damage Susceptibility Assessments

Table 4.9 shows the stripping metrics for the 411-D mixtures. Both the Stripping Inflection Point (SIP) and the Stripping Number (SN) were derived from the HWTT data. The SIP is an AASHTO T 324 parameter whereas the SN is a "novel" parameter proposed by Yin et al. (2014). Table 4.9 shows instances where the SIP is less than 9,000 passes, the SIP criterion established by Yin et al. (2020). Similarly, there were corresponding low SN values (<2000 passes). According to Yin et al. (2020), the SN has less bias since it is determined from the entire rut depth curve. In contrast, the SIP involves the intersection of tangents drawn with respect to portions of the HWTT deformation curve. Interestingly, all of these mixtures incorporated the mandated dosage of liquid anti-stripping additive (i.e., 0.5%). One would therefore expect adequate stripping resistance (i.e., SIP > 9,000 passes and/or SN > 2,000 passes) for all of these mixtures. The fact that this was observed not to be in all case suggests either an ineffectiveness of the particular additive or the use of an additive that is not best suited for the mix in which it was paired.

TABLE 4.9 STRIPPING METRICS FOR 411-D MIXTURES

Mix ID	*Stripping Inflection Point (SIP)*		*Average SIP*	*Stripping Number (SN)*		*Average SN*
D1-64 (Opt)	10096	8604	9350	9988	8000	8994
D1-64 (Opt+0.5%)	6289	8707	7498	1666	1666	1666
D1-76 (Opt)	20992	15080	18036	20002	20002	20002
D1-76 (Opt+0.5%)	15435	13049	14242	7032	7487	7260
D2-64 (Opt)	6475	6159	6317	1820	1422	1621
D2-64 (Opt+0.5%)	6684	4397	5541	1591	1319	1455
D2-76 (Opt)	12719	20996	16858	20002	20002	20002
D2-76 (Opt+0.5%)	15891	3526	9709	5415	20002	12709
D3-64 (Opt)	8489	8327	8408	6600	1682	4141
D3-64 (Opt+0.5%)	4079	6699	5389	1820	989	1405
D3-76 (Opt)	11961	16973	14467	9200	20002	14601
D3-76 (Opt+0.5%)	13030	11193	12112	2618	2343	2481
D4-64 (Opt)	13676	9569	11623	2856	1255	2056
D4-64 (Opt+0.5%)	10898	12526	11712	2576	3141	2859
D4-76 (Opt)	17154	14085	15620	6163	20002	13083
D4-76 (Opt+0.5%)	16190	20991	18591	5791	20002	12897
D5-64 (Opt)	10611	14341	12476	3238	3238	3238
D5-64 (Opt+0.5%)	9699	13379	11539	2895	2895	2895
D5-76 (Opt)	20992	20985	20989	20002	20002	20002
D5-76 (Opt+0.5%)	20992	20983	20988	20002	20002	20002

4.4 Field Core Cracking Resistance Assessments

Before launching the discussion of the Ideal-CT test results for the field cores, prefatory notes are warranted. An error in the performance of the test was noted during data processing. Specifically, the technician failed to allow the load to dissipate to the 0.1 kN level per the test standard. The result of this error is an incomplete load deformation curve. As these were field cores, remaking or more appropriately resampling them was not an option. The first takeaway here is the need to reinforce training with respect to the "new" tests. The second takeaway is actually a fortuitous discovery. To address the deficiency, a model fit of the load-displacement data that was present was developed. A similar model was developed from the laboratory Ideal-CT load-displacement data and statistical upper and lower bounds were determined based on a 95% confidence interval of the Student's t-distribution. The field core load-displacement data were then plotted against these upper and lower limits providing a much better means of comparison than simply reviewing respective CT-Indices side by side. Figures 4.9, 4.10 and 4.11 show the field core Ideal-CT load-displacement curves for the east, middle and west Tennessee JMFs respectively.

The first thing to point out about the trends in Figures 4.9, 4.10 and 4.11 is that all of the field core curves plot below the laboratory specimen limits. This is not surprising as it indicates a dissimilarity of characterization. One must bear in mind that these differences could be the product of insufficient aging of the laboratory mixtures. Additional aging would likely have lowered the envelopes.

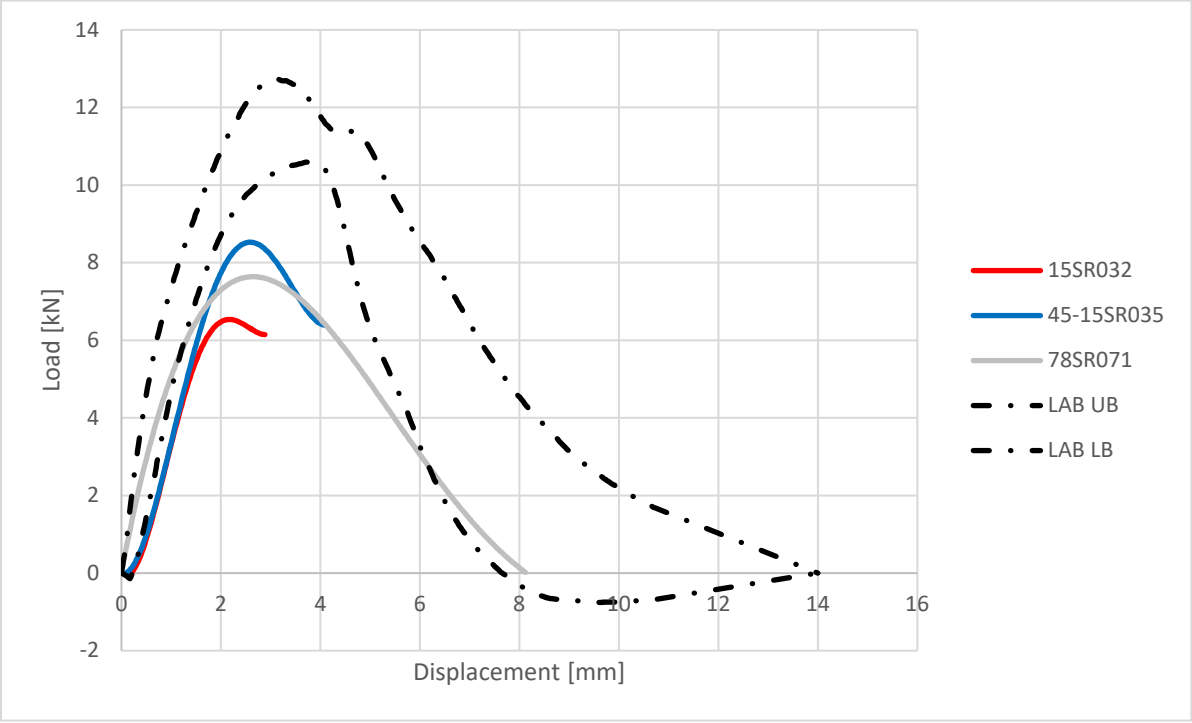


Figure 4.9 Ideal-CT Load-Displacement Curves for East Tennessee Field Cores & JMFs

Still another consideration is the fact that the pavements from which the cores were extracted were estimated to be approximately 5 years old. This could explain the 74SR52 and the 56SR10 Middle Tennessee field cores lying within the laboratory testing band. This actually provides further evidence that the conditioning of the laboratory mixtures was insufficient as the cracking tests are intended to provide information on mixes 8 to 10 years in age.

All of these data and plots provide perspective both regarding the mixtures and cores tested but also about the aging condition of the mixtures tested. Both of these factors warrant additional study.

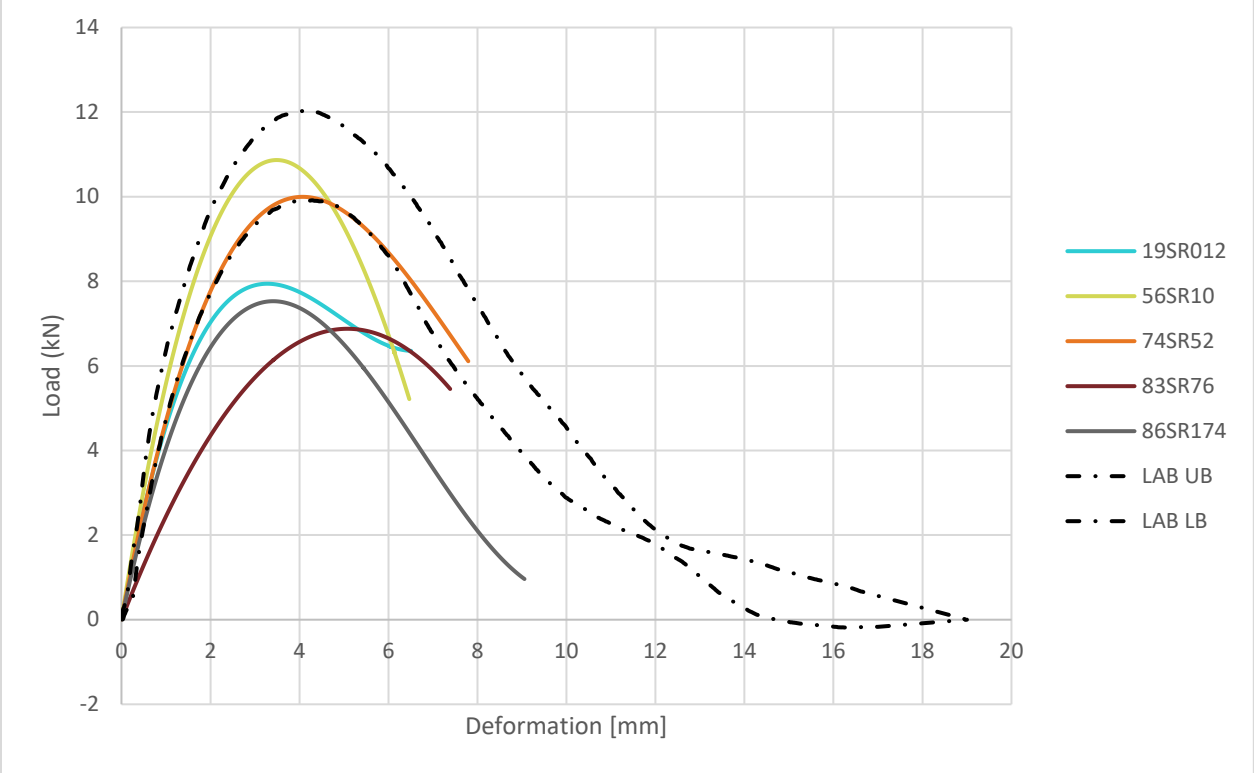


Figure 4.10 Ideal-CT Load-Displacement Curves for Middle Tennessee Field Cores & JMFs

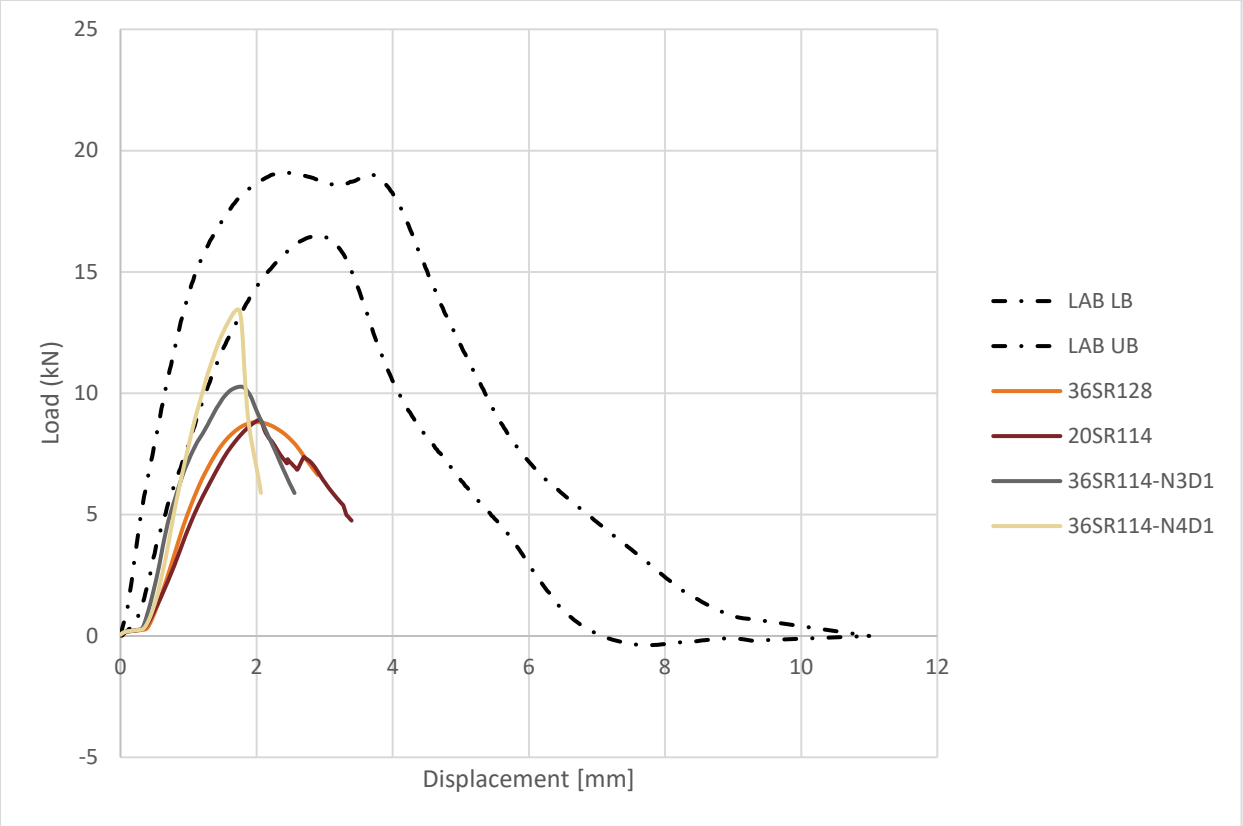


Figure 4.11 Ideal-CT Load-Displacement Curves for West Tennessee Field Cores & JMFs

Chapter 5 Conclusions and Recommendations

5.1 Conclusions

The results generated for the revised test plan support the following conclusions:

- The Hamburg Wheel Tracking Test and particularly the HWTT metrics Rutting Resistance Index (RRI) and Corrected Rut Depth (CRD) were sensitive to mixture binder content variations.
- Moisture damage susceptibility was evident via HWTT stripping metrics.
- HWTT results exhibited high variability with a Coefficient of Variability values as high as 76% for RRI.
- Ideal-RT was sensitive to increased binder content and the test also exhibited a low variability with a Coefficient of Variability ranging from 10 to 14 percent.
- Ideal-CT was likewise sensitive to increased binder content. However, Mix D4 and Mix B2 were exceptionally low (CT_{Index}<30). These values would likely be even lower if mixture conditioning (i.e., aging) was harsher.
- Ideal-CT tests of field cores showed results that were in alignment with laboratory prepared test specimens. Given the age of the pavement from which these were taken (5 years), it's likely that mixture conditioning in the lab inadequately represented field conditions.
- From a BMD perspective, the tests evaluated showed significant response and, in some cases, low enough variability to warrant continued consideration and evaluation.

5.2 Recommendations

The data, results and conclusions presented herein support the following recommendations:

- Further research is needed both in additional BMD benchmark testing but even more so, BMD testing of materials directly linked to field placement and performance monitoring. This way, distinctive and correlative BMD criteria can be established for whatever BMD tests are selected.
- Continue BMD testing with HWTT, Ideal-RT and Ideal-CT as each has shown adequate promise to move forward especially with respect to variability assessment and reduction measures.
- Should TDOT continue to use the Marshall Method of specimen compaction, research should be conducted with the Ideal-RT and Ideal-CT using 4-inch diameter specimens.
- Once BMD criteria have been established, further research is needed to address testing variability and the impact(s) on QC/QA test results.
- Research is needed to address laboratory conditioning (i.e., aging) of mixtures to best replicate field conditions.
- There is a need to better address moisture damage susceptibility and particularly anti-strip effectiveness. The results of this study clearly showed that not all anti-strips are

created equal. A process may need to be developed for the establishment of an appropriate anti-strip product and dosage via testing instead of mandate.

- A better moisture damage susceptibility test is needed as well. In the interim, a shift to AASHTO T 283 with a freeze/thaw cycle may better discriminate anti-strips and dosage rates. Ultimately, a shift to HWTT stripping metrics would be ideal.
- Implement Ideal-RT now both in design and QC/QA. Given the low cost, simplicity and speed of test, there is no reason to delay data collection for validation study.

References

American Association of State Highway and Transportation Officials. (2022). Standard Specifications for Transportation Materials and Methods of Sampling and Testing and AASHTO Provisional Standards.

American Society for Testing and Materials. (2023). Road and Paving Materials, Vol. 04.03.

Hall, K. (2016). Agency Approaches – 3 Main Approaches Identified. Slide from 2016 Presentation of Balanced Mix Design to FHWA Mix ETG. Dartmouth, MA.

National Asphalt Pavement Association. (2023). Balanced Mix Design (BMD) Resource Guide.

Newcomb, D. (2018). Balanced Design of Asphalt Mixtures. Minnesota Department of Transportation. St. Paul, MN.

Tseng, T., & R. Lytton (1989). Prediction of Permanent Deformation in Flexible Pavement Materials. *Implication of Aggregates in the Design, Construction, and Performance of Flexible Pavements.* American Society for Testing and Materials, West Conshohocken, PA.

Wen, H., S. Wu, L. Mohammad, W. Zhang, S. Shen, A. Faheem. (2016). Long-Term Field Rutting and Moisture Susceptibility Performance of Warm Mix Asphalt Pavement. *Transportation Research Record, 2575, 103-112*.

West, R., C. Rodezno, F. Leiva, & F. Yin. (2018). Development of a Framework for Balanced Mix Design. Project NCHRP, 20-07, Task 406.

Yin, F., E. Arambula, R. Lytton, A. Epps Martin, & L. Cucalon. (2014). Novel Method for Moisture Susceptibility and Rutting Evaluation Using Hamburg Wheel Tracking Test. *Transportation Research Record, 2446, 1-7*.

Yin, F., C. Chen, R. West, A. Epps Martin, & E. Arambula. (2020). Determining the Relationship among Hamburg Wheel-Tracking Test Parameters and Correlation to Field Performance of Asphalt Pavements. *Transportation Research Record, 2674(4), 281-291*.

Zhou, F., S. Im, L. Sun, & T. Scullion. (2017). Development of an IDEAL-CT Cracking Test for Asphalt Mix Design and QC/QA. *Journal of the Association of Asphalt Paving Technologists (AAPT), 86, 549-578*.

Zhou, F., W. Crockford, & J. Zhang. (2019). Development of an IDEAL Rutting Test for Asphalt Mixture Design, Quality Control and Quality Assurance. *Journal of the Association of Asphalt Paving Technologists (AAPT)*, Fort Worth, Texas.

Zhou, F. (2021). Implementation of the Ideal Cracking Test for Asphalt Mix Design and QC/QA. Project NCHRP, 20-44(16).

Appendices

Appendix A: Job Mix Formulas

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 02/14/2019 **Roadway Surface** No

Region 1

Hot-mix Producer Summers Taylor - Blountville Drum Plant Asp Mix

Type BPMB-HM **Mix** 307-BM2 PG 64-22 **Item** 307-01.08

Serial No.:	Design No.: 1190378

Material	Size or Grade	Producer and Location	Percent Used
Soft Limestone (aka Non-Sur	#5	Blue Water Industries - Blountville	19.100
Soft Limestone (aka Non-Sur	#7	Blue Water Industries - Blountville	9.550
Soft Limestone (aka Non-Sur	#10	Blue Water Industries - Blountville	33.425
RAP	RAP Processed -3/4	RAP - Summers Taylor - Blountville Drum Plant Asp Mix	19.793
RAP	RAP Processed - 5/16	RAP - Summers Taylor - Blountville Drum Plant Asp Mix	15.207
Asphalt Cement	PG 64-22	ASSOCIATED ASPHALT, BRISTOL	2.925

Percent AC in RAP1:	3.5	Optimum AC Content:	4.50	Total	100.000	
Percent AC in RAP2:	5.8	Anti-Strip Supplier:	Ingevity			
Anti-Strip Additive:	MoreLife 5000 (Terminal)	Dosage:	0.5%			
AC Contribution:	Virgin AC	2.93	RAP AC	1.57	Percent Virgin AC:	65.0
Asphalt Sp. Gravity:	1.034	Dust to Asphalt Ratio:	1.41			

% Fracture Face on CA:	n/a	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:		Eff. Gravity of Agg:	2.679
Theo.Gravity of RAP2:			
Theo. Gravity of Mix:	2.500	T.S.R.: 90.2	Lbs/Ft³: 156.0
L.O.I.:		Ignition Oven Corr. Factor:	0.25
		Warm Mix?	No

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	300	Mixing Temp Range(°F):	270ºF ≤ T ≤ 310ºF
Lab Compaction Temp (± 5 °F):	280	Delivery Temperature(°F):	270ºF ≤ T ≤ 310ºF

	Percents Used								
Sieve Size	#5	#7	#10			RAP Processed - 3/4	RAP Processed - 5/16	% Req.	Design Range
	20.0	10.0	35.0			20.0	15.0	100	
2"									
1.5"									
1.25"	100	100	100			100	100	100	100
1"									
3/4"	59	100	100			100	100	92	81-93
5/8"									
1/2"									
3/8"	2	59	100			55	97	67	57-73
No.4	1	5	88			45	80	53	40-56
No.8		2	60			32	52	35	28-43
No.16									
No.30			25			15	27	16	13-25
No.50			18			10	20	11	9-19
No.100			14.0			7.0	12.0	8.1	6-10
No.200			11.0			5.0	9.9	6.3	2.5-6.5

Requested: KURT MILLER #2338 **Approved:**

Contractor Personnel and Lab Tech Cert No. Regional Materials and Tests Supervisor

Date last lab inspection 10/24/2017

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 02/14/2019 **Roadway Surface** No

Region 1

Hot-mix Producer Summers Taylor - Blountville Drum Plant Asp Mix

Type BPMB-HM **Mix** 307-BM2 PG 76-22 **Item** 307-03.08

Serial No.:	Same as 1190378	Design No.:	1190380

Material	Size or Grade	Producer and Location	Percent Used
Soft Limestone (aka Non-Sur	#5	Blue Water Industries - Blountville	19.100
Soft Limestone (aka Non-Sur	#7	Blue Water Industries - Blountville	9.550
Soft Limestone (aka Non-Sur	#10	Blue Water Industries - Blountville	33.425
RAP	RAP Processed -3/4	RAP - Summers Taylor - Blountville Drum Plant Asp Mix	19.793
RAP	RAP Processed - 5/16	RAP - Summers Taylor - Blountville Drum Plant Asp Mix	15.207
Asphalt Cement	PG 76-22	ASSOCIATED ASPHALT, BRISTOL	2.925

Percent AC in RAP1:	3.5	Optimum AC Content:		4.50	Total	100.000
Percent AC in RAP2:	5.8		Anti-Strip Supplier:		Ingevity	
Anti-Strip Additive:		MoreLife 5000 (Terminal)		Dosage:		0.5%
AC Contribution:	Virgin AC	2.93	RAP AC	1.57	Percent Virgin AC:	65.0
Asphalt Sp. Gravity:		1.028		Dust to Asphalt Ratio:		1.41

% Fracture Face on CA:	n/a		% Glassy Particles on CA:		n/a
Theo.Gravity of RAP1:			Eff. Gravity of Agg:		2.681
Theo.Gravity of RAP2:					
Theo. Gravity of Mix:	2.500	T.S.R.:	90.2	Lbs/Ft³:	156.0
L.O.I.:			Ignition Oven Corr. Factor:		0.25
			Warm Mix?		No

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	320	Mixing Temp Range(°F):	290ºF ≤ T ≤ 330ºF
Lab Compaction Temp (± 5 °F):	300	Delivery Temperature(°F):	290ºF ≤ T ≤ 330ºF

	Percents Used								
Sieve Size	#5	#7	#10			RAP Processed - 3/4	RAP Processed - 5/16	% Req.	Design Range
	20.0	10.0	35.0			20.0	15.0	100	
2"									
1.5"									
1.25"	100	100	100			100	100	100	100
1"									
3/4"	59	100	100			100	100	92	81-93
5/8"									
1/2"									
3/8"	2	59	100			55	97	67	57-73
No.4	1	5	88			45	80	53	40-56
No.8		2	60			32	52	35	28-43
No.16									
No.30			25			15	27	16	13-25
No.50			18			10	20	11	9-19
No.100			14.0			7.0	12.0	8.1	6-10
No.200			11.0			5.0	9.9	6.3	2.5-6.5

Requested: KURT MILLER #2338
Contractor Personnel and Lab Tech Cert No.

Approved:
Regional Materials and Tests Supervisor

Date last lab inspection 10/24/2017

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 01/15/2019 **Roadway Surface** Yes

Region 2

Hot-mix Producer Southeastern Mtls - Cleveland Asphalt Mix

Type ACS-HM **Mix** 411-D PG 64-22 **Item** 411-01.10

Serial No.:	Design No.: 2190099

Material	Size or Grade	Producer and Location	Percent Used
Granite	D Rock	Harrison Construction (APAC)-Cherokee County-Murphy	14.145
Granite	D Rock	Harrison Construction (APAC)-Cherokee County-Murphy	28.290
Soft Limestone (aka Non-Sur	#10	Vulcan Materials-Cleveland	18.860
Natural Sand	Natural Sand	Sand Switch Sand	23.575
RAP	RAP Processed -1/2	RAP - Southeastern Mtls - Cleveland Asphalt Mix	10.011
Asphalt Cement	PG 64-22	PHILLIPS 66, CHATTANOOGA TERMINAL	5.119

Percent AC in RAP1:		Optimum AC Content:		5.70	Total		100.000
Percent AC in RAP2:	5.8	Anti-Strip Supplier:			Tri-State Sand LLC		
Anti-Strip Additive:		Pave Grip TS 23			Dosage:		0.5%
AC Contribution:	Virgin AC	5.12	RAP AC	0.58	Percent Virgin AC:		89.8
Asphalt Sp. Gravity:		1.032			Dust to Asphalt Ratio:		1.01

% Fracture Face on CA:	n/a	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:		Eff. Gravity of Agg:	2.722
Theo.Gravity of RAP2:			
Theo. Gravity of Mix:	2.490	T.S.R.: 86.2	Lbs/Ft³: 155.4
L.O.I.:	8.5	Ignition Oven Corr. Factor:	0.10
		Warm Mix?	

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	300	Mixing Temp Range(°F):	270ºF ≤ T ≤ 310ºF
Lab Compaction Temp (± 5 °F):	270	Delivery Temperature(°F):	270ºF ≤ T ≤ 310ºF

	Percents Used								
Sieve Size	D Rock 15.0	D Rock 30.0	#10 20.0	Natural Sand 25.0			RAP Processed - 1/2 10.0	% Req. 100	Design Range
2"									
1.5"									
1.25"									
1"									
3/4"									
5/8"	100	100	100	100			100	100	100
1/2"	92	100	100	100			100	99	95-100
3/8"	45	96	100	100			92	90	80-93
No.4	8	19	96	95			71	57	54-76
No.8	5	10	65	79			51	42	35-57
No.16									
No.30	4	5	31	66			30	28	17-29
No.50	3	5	22	33			18	16	10-18
No.100	3.2	4.5	16.6	9.5			13.2	8.8	3-10
No.200	3.0	4.1	12.5	2.5			9.5	5.8	0-6.5

Requested: Gedeon Mondido # 1771 (Contractor Personnel and Lab Tech Cert No.) **Approved:** (Regional Materials and Tests Supervisor)

Date last lab inspection 2/16/2018

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 01/15/2019 **Roadway Surface** Yes

Region 2

Hot-mix Producer Southeastern Mtls - Cleveland Asphalt Mix

Type ACS-HM **Mix** 411-D PG 76-22 **Item** 411-02.10

Serial No.:	Design No.: 2190101

Material	Size or Grade	Producer and Location	Percent Used
Granite	D Rock	Harrison Construction (APAC)-Cherokee County-Murphy	14.145
Granite	D Rock	Harrison Construction (APAC)-Cherokee County-Murphy	28.290
Soft Limestone (aka Non-Sur	#10	Vulcan Materials-Cleveland	18.860
Natural Sand	Natural Sand	Sand Switch Sand	23.575
RAP	RAP Processed -1/2	RAP - Southeastern Mtls - Cleveland Asphalt Mix	10.011
Asphalt Cement	PG 76-22	PHILLIPS 66, CHATTANOOGA TERMINAL	5.119

Percent AC in RAP1:		Optimum AC Content:	5.70	Total		100.000
Percent AC in RAP2:	5.8	Anti-Strip Supplier:		Tri-State Sand LLC		
Anti-Strip Additive:	Pave Grip TS 23			Dosage:		0.5%
AC Contribution:	Virgin AC	5.12	RAP AC	0.58	Percent Virgin AC:	89.8
Asphalt Sp. Gravity:	1.032			Dust to Asphalt Ratio:		1.01

% Fracture Face on CA:	n/a	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:		Eff. Gravity of Agg:	2.722
Theo.Gravity of RAP2:			
Theo. Gravity of Mix:	2.490	T.S.R.: 86.2	Lbs/Ft³: 155.4
L.O.I.:	8.5	Ignition Oven Corr. Factor:	0.10
		Warm Mix?	

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	310	Mixing Temp Range(°F):	290ºF ≤ T ≤ 330ºF
Lab Compaction Temp (± 5 °F):	290	Delivery Temperature(°F):	290ºF ≤ T ≤ 330ºF

	Percents Used								
Sieve Size	D Rock 15.0	D Rock 30.0	#10 20.0	Natural Sand 25.0			RAP Processed - 1/2 10.0	% Req. 100	Design Range
2"									
1.5"									
1.25"									
1"									
3/4"									
5/8"	100	100	100	100			100	100	100
1/2"	92	100	100	100			100	99	95-100
3/8"	45	96	100	100			92	90	80-93
No.4	8	19	96	95			71	57	54-76
No.8	5	10	65	79			51	42	35-57
No.16									
No.30	4	5	31	66			30	28	17-29
No.50	3	5	22	33			18	16	10-18
No.100	3.2	4.5	16.6	9.5			13.2	8.8	3-10
No.200	3.0	4.1	12.5	2.5			9.5	5.8	0-6.5

Requested: Gedeon Mondido # 1771 **Approved:**

Contractor Personnel and Lab Tech Cert No. Regional Materials and Tests Supervisor

Date last lab inspection 2/16/2018

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 01/17/2019 **Roadway Surface** No

Region 3

Hot-mix Producer Rogers Group - Gallatin Asphalt Mix

Type BPMB-HM **Mix** 307-BM2 PG 64-22 **Item**

Serial No.:	19M0017	Design No.:	3190049

Material	Size or Grade	Producer and Location	Percent Used
Soft Limestone (aka Non-Sur	#57	Rogers Group-Gallatin	28.740
Hard Limestone (Type II)	#78	Rogers Group-Cross Plains-RockHouse	9.580
Soft Limestone (aka Non-Sur	#10 - Washed	Rogers Group-Gallatin	14.370
Natural Sand	Natural Sand	Pine Bluff Sand and Gravel-Nashville	14.370
RAP	RAP Processed Coarse	Rogers Group-Gallatin	30.031
Asphalt Cement	PG 64-22	ERGON ASPHALT & EMULSIONS, NASHVILLE TERMINAL	2.909

Percent AC in RAP1:		Optimum AC Content:	4.20	Total	100.000
Percent AC in RAP2:	4.3	Anti-Strip Supplier:	MWV Asphalt Innovations		
Anti-Strip Additive:	EVOTHERM			Dosage:	0.5%
AC Contribution:	Virgin AC 2.91	RAP AC	1.29	Percent Virgin AC:	69.3
Asphalt Sp. Gravity:	1.037	Dust to Asphalt Ratio:			1.31

% Fracture Face on CA:	n/a	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:		Eff. Gravity of Agg:	2.697
Theo.Gravity of RAP2:	2.521		
Theo. Gravity of Mix:	2.528	T.S.R.: 85.6	Lbs/Ft³: 157.7
L.O.I.:		Ignition Oven Corr. Factor:	0.40
		Warm Mix?	No

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	310	Mixing Temp Range(°F):	270ºF ≤ T ≤ 310ºF
Lab Compaction Temp (± 5 °F):	275	Delivery Temperature(°F):	270ºF ≤ T ≤ 310ºF

	Percents Used								
Sieve Size	#57	#78	#10 - Washed	Natural Sand			RAP Processed Coarse	% Req.	Design Range
	30.0	10.0	15.0	15.0			30.0	100	
2"									
1.5"									
1.25"	100	100	100	100			100	100	100
1"									
3/4"	76	100	100	100			100	93	81-93
5/8"									
1/2"									
3/8"	25	68	100	100			93	72	57-73
No.4	6	10	92	97			65	51	40-56
No.8	3	4	58	91			50	39	28-43
No.16									
No.30	2	3	19	67			35	24	13-25
No.50	2	3	10	13			25	12	9-19
No.100	1.6	2.9	6.0	0.9			18.0	7.2	6-10
No.200	1.5	2.8	5.0	0.7			13.0	5.5	2.5-6.5

Requested: Brittany Evans LT # 2533 (Contractor Personnel and Lab Tech Cert No.) **Approved:** (Regional Materials and Tests Supervisor)

Date last lab inspection 1/10/2019

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 02/08/2019 **Roadway Surface** Yes

Region 3

Hot-mix Producer Rogers Group - Gallatin Asphalt Mix

Type ACS-HM **Mix** 411-D PG 64-22 **Item**

Serial No.:	19M0061	Design No.:	3190178

Material	Size or Grade	Producer and Location	Percent Used
Hard Limestone (Type II)	#78	Rogers Group-Cross Plains-RockHouse	28.260
Hard Limestone (Type II)	#10	Rogers Group-Cross Plains-RockHouse	14.130
Soft Limestone (aka Non-Sur	#10 - Washed	Rogers Group-Gallatin	18.840
Natural Sand	Natural Sand	Pine Bluff Sand and Gravel-Nashville	18.840
RAP	RAP Processed - 5/16	Rogers Group-Gallatin	14.984
Asphalt Cement	PG 64-22	ERGON ASPHALT & EMULSIONS, NASHVILLE TERMINAL	4.946

Percent AC in RAP1:		Optimum AC Content:	5.80	Total	100.000
Percent AC in RAP2:	5.7	Anti-Strip Supplier:	MWV Asphalt Innovations		
Anti-Strip Additive:	EVOTHERM			Dosage:	0.5%
AC Contribution:	Virgin AC 4.95	RAP AC	0.85	Percent Virgin AC:	85.3
Asphalt Sp. Gravity:	1.037			Dust to Asphalt Ratio:	1.13

% Fracture Face on CA:	n/a	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:		Eff. Gravity of Agg:	2.646
Theo.Gravity of RAP2:			
Theo. Gravity of Mix:	2.427	T.S.R.: 88.4	Lbs/Ft³: 151.5
L.O.I.:	21.4	Ignition Oven Corr. Factor:	0.55
		Warm Mix?	No

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	310	Mixing Temp Range(°F):	270ºF ≤ T ≤ 310ºF
Lab Compaction Temp (± 5 °F):	270	Delivery Temperature(°F):	270ºF ≤ T ≤ 310ºF

	Percents Used								
Sieve Size	#78	#10	#10 - Washed	Natural Sand			RAP Processed - 5/16	% Req.	Design Range
	30.0	15.0	20.0	20.0			15.0	100	
2"									
1.5"									
1.25"									
1"									
3/4"									
5/8"	100	100	100	100			100	100	100
1/2"	95	100	100	100			100	98	95-100
3/8"	67	100	100	100			100	90	80-93
No.4	11	93	92	97			96	69	54-76
No.8	4	62	57	91			78	52	35-57
No.16									
No.30	3	29	20	67			45	29	17-29
No.50	3	22	11	13			33	14	10-18
No.100	2.9	17.5	5.8	0.9			22.0	8.1	3-10
No.200	2.8	15.0	4.5	0.7			16.1	6.5	0-6.5

Requested: Brittany Evans LT # 2533 (Contractor Personnel and Lab Tech Cert No.) **Approved:** (Regional Materials and Tests Supervisor)

Date last lab inspection 1/10/2019

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 02/08/2019 **Roadway Surface** Yes

Region 3

Hot-mix Producer Rogers Group - Gallatin Asphalt Mix

Type ACS-HM **Mix** 411-D PG 76-22 **Item**

Serial No.:	19M0061	Design No.:	3190180

Material	Size or Grade	Producer and Location	Percent Used
Hard Limestone (Type II)	#78	Rogers Group-Cross Plains-RockHouse	28.260
Hard Limestone (Type II)	#10	Rogers Group-Cross Plains-RockHouse	14.130
Soft Limestone (aka Non-Sur	#10 - Washed	Rogers Group-Gallatin	18.840
Natural Sand	Natural Sand	Pine Bluff Sand and Gravel-Nashville	18.840
RAP	RAP Processed - 5/16	Rogers Group-Gallatin	14.984
Asphalt Cement	PG 76-22	ERGON ASPHALT & EMULSIONS, NASHVILLE TERMINAL	4.946

Percent AC in RAP1:		**Optimum AC Content:**	5.80	**Total**	100.000
Percent AC in RAP2:	5.7	**Anti-Strip Supplier:**	MWV Asphalt Innovations		
Anti-Strip Additive:	EVOTHERM			**Dosage:**	0.5%
AC Contribution:	**Virgin AC** 4.95	**RAP AC**	0.85	**Percent Virgin AC:**	85.3
Asphalt Sp. Gravity:	1.037		**Dust to Asphalt Ratio:**		1.13

% Fracture Face on CA:	n/a	**% Glassy Particles on CA:**	n/a
Theo.Gravity of RAP1:		**Eff. Gravity of Agg:**	2.646
Theo.Gravity of RAP2:			
Theo. Gravity of Mix:	2.427	**T.S.R.:** 88.4	**Lbs/Ft^3:** 151.5
L.O.I.:	21.4	**Ignition Oven Corr. Factor:**	0.55
		Warm Mix?	No

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	310	**Mixing Temp Range(°F):**	290ºF ≤ T ≤ 330ºF
Lab Compaction Temp (± 5 °F):	270	**Delivery Temperature(°F):**	290ºF ≤ T ≤ 330ºF

	Percents Used								
Sieve Size	#78	#10	#10 - Washed	Natural Sand			RAP Processed - 5/16	% Req.	Design Range
	30.0	15.0	20.0	20.0			15.0	100	
2"									
1.5"									
1.25"									
1"									
3/4"									
5/8"	100	100	100	100			100	100	100
1/2"	95	100	100	100			100	98	95-100
3/8"	67	100	100	100			100	90	80-93
No.4	11	93	92	97			96	69	54-76
No.8	4	62	57	91			78	52	35-57
No.16									
No.30	3	29	20	67			45	29	17-29
No.50	3	22	11	13			33	14	10-18
No.100	2.9	17.5	5.8	0.9			22.0	8.1	3-10
No.200	2.8	15.0	4.5	0.7			16.1	6.5	0-6.5

Requested: Brittany Evans LT # 2533 (Contractor Personnel and Lab Tech Cert No.) **Approved:** (Regional Materials and Tests Supervisor)

Date last lab inspection 1/10/2019

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 02/12/2019 **Roadway Surface** Yes

Region 3

Hot-mix Producer Vulcan - Hermitage

Type ACS-HM **Mix** 411-D PG 64-22 **Item**

Serial No.:	19M0070	Design No.:	3190208

Material	Size or Grade	Producer and Location	Percent Used
Hard Limestone (Type I)	D Rock	Vulcan Materials - Springfield	33.005
Hard Limestone (Type I)	#10	Vulcan Materials - Springfield	18.860
Natural Sand	Natural Sand	Pine Bluff Sand & Gravel - Nashville	18.860
Soft Limestone (aka Non-Sur	#10 - Washed	Vulcan Materials - Nashville Danley Plant	14.145
RAP	RAP Processed -1/2	RAP - Vulcan - Hermitage	9.874
Asphalt Cement	PG 64-22	ERGON ASPHALT & EMULSIONS, NASHVILLE TERMINAL	5.256

Percent AC in RAP1:		Optimum AC Content:	5.70	Total	100.000	
Percent AC in RAP2:	4.5	Anti-Strip Supplier:	Westvaco Polychemical Dept			
Anti-Strip Additive:	Evotherm P- 25 @ Terminal			Dosage:	0.5%	
AC Contribution:	Virgin AC	5.26	RAP AC	0.44	Percent Virgin AC:	92.2
Asphalt Sp. Gravity:	1.03			Dust to Asphalt Ratio:		1.06

% Fracture Face on CA:	100	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:	2.68	Eff. Gravity of Agg:	2.616
Theo.Gravity of RAP2:			
Theo. Gravity of Mix:	2.405	T.S.R.: 87.6	Lbs/Ft³: 150.1
L.O.I.:	19.0	Ignition Oven Corr. Factor:	
		Warm Mix?	No

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	300	Mixing Temp Range(°F):	270ºF ≤ T ≤ 310ºF
Lab Compaction Temp (± 5 °F):	270	Delivery Temperature(°F):	270ºF ≤ T ≤ 310ºF

	Percents Used								
Sieve Size	D Rock	#10	Natural Sand	#10 - Washed			RAP Processed - 1/2	% Req.	Design Range
	35.0	20.0	20.0	15.0			10.0	100	
2"									
1.5"									
1.25"									
1"									
3/4"									
5/8"	100	100	100	100			100	100	100
1/2"	90	100	100	100			100	97	95-100
3/8"	60	100	100	100			95	86	80-93
No.4	14	97	99	80			76	64	54-76
No.8	6	60	92	51			60	46	35-57
No.16									
No.30	5	25	61	20			33	25	17-29
No.50	4	20	12	15			22	12	10-18
No.100	3.0	16.0	2.0	11.0			18.0	8.1	3-10
No.200	2.0	14.0	1.5	5.5			14.0	6.0	0-6.5

Requested: Vulcan Mtls. Eric Mundy 4007 **Approved:**

Contractor Personnel and Lab Tech Cert No. Regional Materials and Tests Supervisor

Date last lab inspection 2/4/2019

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 01/15/2019 **Roadway Surface** No

Region 4

Hot-mix Producer Lehman Roberts - Memphis Carrier Asphalt Mix

Type BPMB-HM **Mix** 307-BM2 PG 76-22 **Item** 307-03.03

Serial No.:	Design No.: 4190018

Material	Size or Grade	Producer and Location	Percent Used
Soft Limestone (aka Non-Sur	#57	Vulcan Materials - Memphis	38.280
Natural Sand	Natural Sand	Memphis Stone & Gravel - Senatobia MS Aggregate	10.527
Gravel	D Rock	Memphis Stone & Gravel - Senatobia MS Aggregate	11.484
Soft Limestone (aka Non-Sur	#10	Vulcan Materials - Memphis	6.699
RAP	RAP Processed - 5/16	RAP - Lehman Roberts - Memphis Carrier Asphalt Mix	20.233
RAP	RAP Processed -3/4	RAP - Lehman Roberts - Memphis Carrier Asphalt Mix	9.969
Asphalt Cement	PG 76-22	MARATHON PETROLEUM CO., MEMPHIS, TN	2.809

Percent AC in RAP1:	5.4	Optimum AC Content:	4.30	Total	100.000	
Percent AC in RAP2:	4.0	Anti-Strip Supplier:	Tri-State Sand LLC			
Anti-Strip Additive:	AD-HERE 7700	Dosage:	0.5%			
AC Contribution:	Virgin AC	2.81	RAP AC	1.49	Percent Virgin AC:	65.3
Asphalt Sp. Gravity:	10.29	Dust to Asphalt Ratio:	1.02			

% Fracture Face on CA:	92	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:	2.669	Eff. Gravity of Agg:	2.399
Theo.Gravity of RAP2:	2.661		

Theo. Gravity of Mix:	2.481	T.S.R.:	90.3	Lbs/Ft³:	154.8
L.O.I.:		Ignition Oven Corr. Factor:			0.14
		Warm Mix?		No	

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	320	Mixing Temp Range(°F):	290ºF ≤ T ≤ 330ºF
Lab Compaction Temp (± 5 °F):	320	Delivery Temperature(°F):	290ºF ≤ T ≤ 330ºF

	Percents Used								
Sieve Size	#57	Natural Sand	D Rock	#10		RAP Processed - 5/16	RAP Processed - 3/4	% Req.	Design Range
	40.0	11.0	12.0	7.0		20.0	10.0	100	
2"									
1.5"									
1.25"	100	100	100	100		100	100	100	100
1"									
3/4"	83	100	100	100		100	100	93	81-93
5/8"									
1/2"									
3/8"	18	100	76	100		98	61	60	57-73
No.4	3	88	47	95		81	41	43	40-56
No.8	2	63	29	69		62	32	32	28-43
No.16									
No.30	2	40	12	37		38	21	19	13-25
No.50	2	14	8	26		20	11	10	9-19
No.100	1.7	1.8	5.7	22.0		11.5	6.5	6.1	6-10
No.200	1.5	0.7	4.1	17.0		7.6	5.0	4.4	2.5-6.5

Requested: Matt Lewis Cert# 1302 (Contractor Personnel and Lab Tech Cert No.) **Approved:** (Regional Materials and Tests Supervisor)

Date last lab inspection 2/17/2018

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 01/17/2019 **Roadway Surface** Yes

Region 4

Hot-mix Producer Standard Construction - Collierville Asphalt Mix

Type BPMB-HM **Mix** 307-BM2 PG 64-22 **Item**

Serial No.:	Design No.: 4190152

Material	Size or Grade	Producer and Location	Percent Used
Soft Limestone (aka Non-Sur	#57	Fullen Dock and Warehouse	14.280
Gravel	BM-2 Rock	Standard Construction-Deadfall Pit-Millington	28.560
Soft Limestone (aka Non-Sur	#10	Fullen Dock and Warehouse	9.520
Natural Sand	Natural Sand	Standard Construction-Deadfall Pit-Millington	14.280
RAP	RAP Processed - 5/16	RAP - Standard Construction - Collierville Asphalt Mix	20.342
RAP	RAP Processed -1/2	RAP - Standard Construction - Collierville Asphalt Mix	9.845
Asphalt Cement	PG 64-22	ERGON ASPHALT & EMULSIONS, MEMPHIS, TN	3.173

Percent AC in RAP1:	6.4	Optimum AC Content:		4.80	Total	100.000
Percent AC in RAP2:	3.3		Anti-Strip Supplier:		Arr-Mazz Products	
Anti-Strip Additive:		Nova Grip 975			Dosage:	0.5%
AC Contribution:	Virgin AC	3.17	RAP AC	1.63	Percent Virgin AC:	66.1
Asphalt Sp. Gravity:		1.043			Dust to Asphalt Ratio:	1.11

% Fracture Face on CA:	92.3	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:	2.511	Eff. Gravity of Agg:	2.596
Theo.Gravity of RAP2:	2.461		
Theo. Gravity of Mix:	2.423	T.S.R.: 92.8	Lbs/Ft³: 151.2
L.O.I.:	8.0	Ignition Oven Corr. Factor:	0.36
		Warm Mix?	No

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	310	Mixing Temp Range(°F):	270ºF ≤ T ≤ 310ºF
Lab Compaction Temp (± 5 °F):	300	Delivery Temperature(°F):	270ºF ≤ T ≤ 310ºF

	Percents Used								
Sieve Size	#57	BM-2 Rock	#10	Natural Sand		RAP Processed - 5/16	RAP Processed - 1/2	% Req.	Design Range
	15.0	30.0	10.0	15.0		20.0	10.0	100	
2"									
1.5"									
1.25"	100	100	100	100		100	100	100	100
1"									
3/4"	67	94	100	100		100	100	93	81-93
5/8"									
1/2"									
3/8"	17	54	100	100		100	76	71	57-73
No.4	4	30	89	97		91	29	54	40-56
No.8	4	21	48	88		69	23	41	28-43
No.16									
No.30	3	9	25	66		40	16	25	13-25
No.50	2	6	19	14		24	9	12	9-19
No.100	1.9	5.0	15.6	1.2		14.3	6.3	7.0	6-10
No.200	1.7	4.0	12.8	0.7		9.8	5.3	5.3	2.5-6.5

Requested: John L Diaz
Contractor Personnel and Lab Tech Cert No.

Approved:
Regional Materials and Tests Supervisor

Date last lab inspection 3/11/2018

STATE OF TENNESSEE ASPHALT JOB MIX FORMULA

2016 V4.06 V4.06

Date 04/22/2019 **Roadway Surface** Yes

Region 4

Hot-mix Producer Delta Contracting - Savannah Asphalt Mix

Type ACS-HM **Mix** 411-D PG 64-22 **Item** 411-01.10

Serial No.:	Design No.: 4190198

Material	Size or Grade	Producer and Location	Percent Used
Gravel	D Rock	Rogers Group - TN River Sand & Gravel - Linden	42.300
Soft Limestone (aka Non-Sur	#10	Vulcan Materials - Savannah	18.800
Natural Sand	Natural Sand	Standard Construction - Stantonville Aggregate	18.800
RAP	RAP Processed -1/2	RAP - Delta Contracting - Savannah Asphalt Mix	14.952
Asphalt Cement	PG 64-22	ERGON ASPHALT & EMULSIONS, IUKA, MS	5.148

Percent AC in RAP1:	5.7	Optimum AC Content:	6.00	Total	100.000
Percent AC in RAP2:		Anti-Strip Supplier:		Tri-State Sand LLC	
Anti-Strip Additive:	Astec Green/TS-43 @ Plant			Dosage:	0.5%
AC Contribution:	Virgin AC	5.15	RAP AC	0.85	Percent Virgin AC:	85.8
Asphalt Sp. Gravity:	1.03			Dust to Asphalt Ratio:		1.00

% Fracture Face on CA:	94.9	% Glassy Particles on CA:	n/a
Theo.Gravity of RAP1:	2.355	Eff. Gravity of Agg:	2.515
Theo.Gravity of RAP2:			
Theo. Gravity of Mix:	2.315	T.S.R.:	91.9	Lbs/Ft³:	144.5
L.O.I.:	10.9	Ignition Oven Corr. Factor:		0.59
		Warm Mix?		Yes

Lab Temperature		Plant Temperature	
Mixing Temperature (± 5 °F):	290	Mixing Temp Range(°F):	270ºF ≤ T ≤ 300ºF
Lab Compaction Temp (± 5 °F):	285	Delivery Temperature(°F):	270ºF ≤ T ≤ 300ºF

	Percents Used								
Sieve Size	D Rock	#10	Natural Sand			RAP Processed - 1/2		% Req.	Design Range
	45.0	20.0	20.0			15.0		100	
2"									
1.5"									
1.25"									
1"									
3/4"									
5/8"	100	100	100			100		100	100
1/2"	96	100	100			100		98	95-100
3/8"	80	100	100			87		89	80-93
No.4	50	95	95			68		71	54-76
No.8	31	66	79			54		51	35-57
No.16									
No.30	10	31	58			35		28	17-29
No.50	7	23	14			21		14	10-18
No.100	5.0	18.0	4.5			12.0		8.6	3-10
No.200	3.1	15.3	2.5			7.0		6.0	0-6.5

Requested: James Hopkins 2549 **Approved:**

Contractor Personnel and Lab Tech Cert No. Regional Materials and Tests Supervisor

Date last lab inspection 3/12/2019

Appendix B: Field Core Log

Core Label: 78SR071S

Number: 4

Thickness: 16.5”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: SR012

Number: 1

Thickness: 17”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: 78SR071S

Number: 3

Thickness: 17”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: 19SR012

Number: 2

Thickness: 19”

Region:3

County: Davidson

JMF No. 3190178

Core Label: 19SR012

Number: 3

Thickness: 14”

Region: 3

County: Davidson

JMF No. 3190178

Core Label: 19SR012

Number: 4

Thickness: 21.5”

Region: 3

County: Davidson

JMF No. 3190178

Core Label: 78SR071S

Number: 1

Thickness: 22”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: 78SR071N

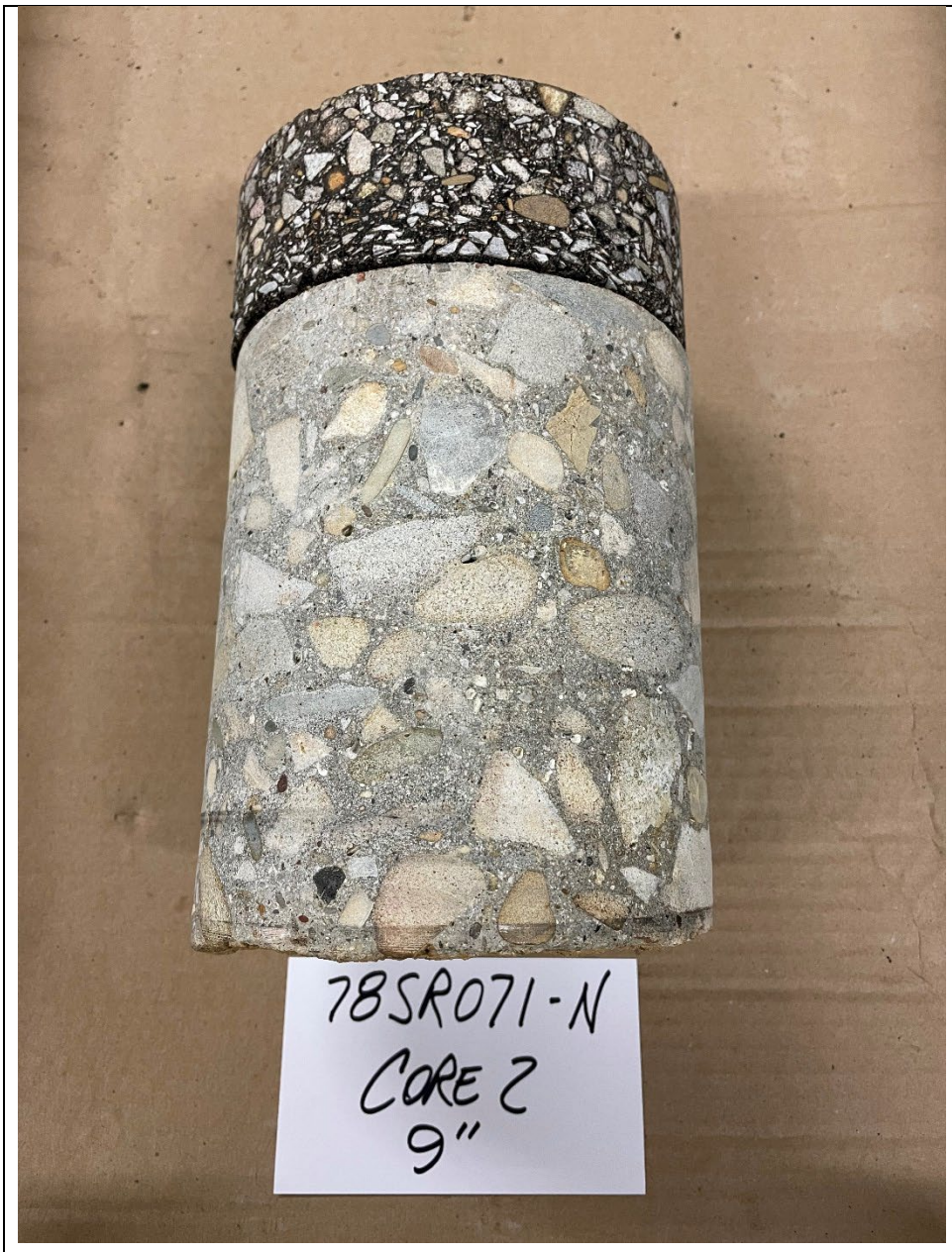
Number: 1

Thickness: 8”

Region: 1

County: Sevier

JMF No. 1190325



Core Label: 78SR071N

Number: 2

Thickness: 9”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: 78SR071N

Number: 3

Thickness: 9”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: 78SR071S

Number: 2

Thickness: 24”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: 78SR071N

Number: 4

Thickness: 11.5”

Region: 1

County: Sevier

JMF No. 1190325

Core Label: 20SR114

Number: 1

Thickness: 16.5”

Region: 4

County: Decatur

JMF No. 4190198

Core Label: 20SR114-N

Number: 2

Thickness: 14.5”

Region: 4

County: Decatur

JMF No. 4190198

Core Label: 20SR114N

Number: 3

Thickness: 16”

Region: 4

County: Decatur

JMF No. 4190198

Core Label: 20SR114N

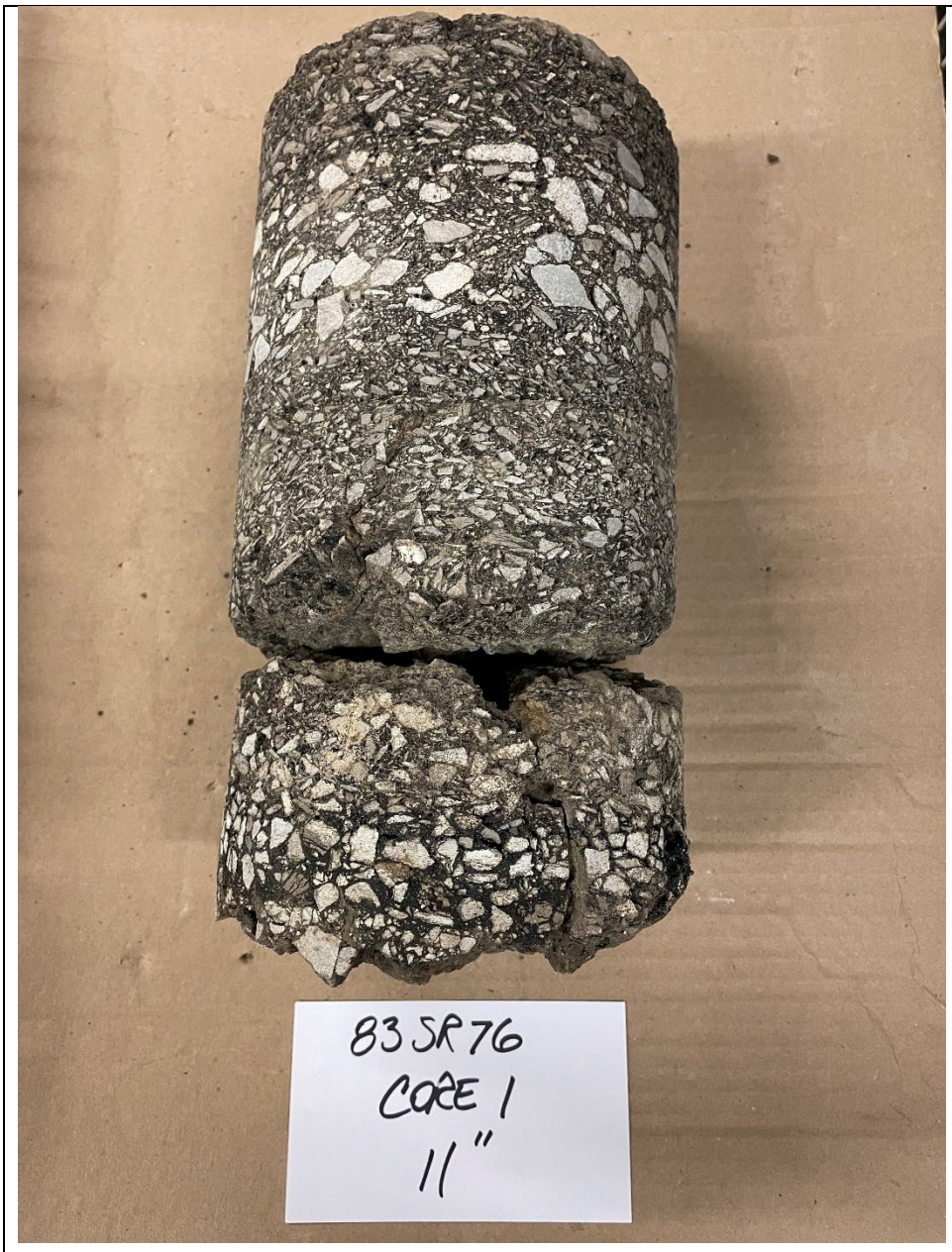
Number: 4

Thickness: 13.5”

Region: 4

County: Decatur

JMF No. 4190198



Core Label: 83SR76

Number: 1

Thickness: 11”

Region: 3

County: Sumner

JMF No. 3190178

Core Label: 83SR76

Number: 2

Thickness: 12”

Region: 3

County: Sumner

JMF No. 3190178

Core Label: 83SR76

Number: 3

Thickness: 8”

Region: 3

County: Sumner

JMF No. 3190178

Core Label: 83SR76

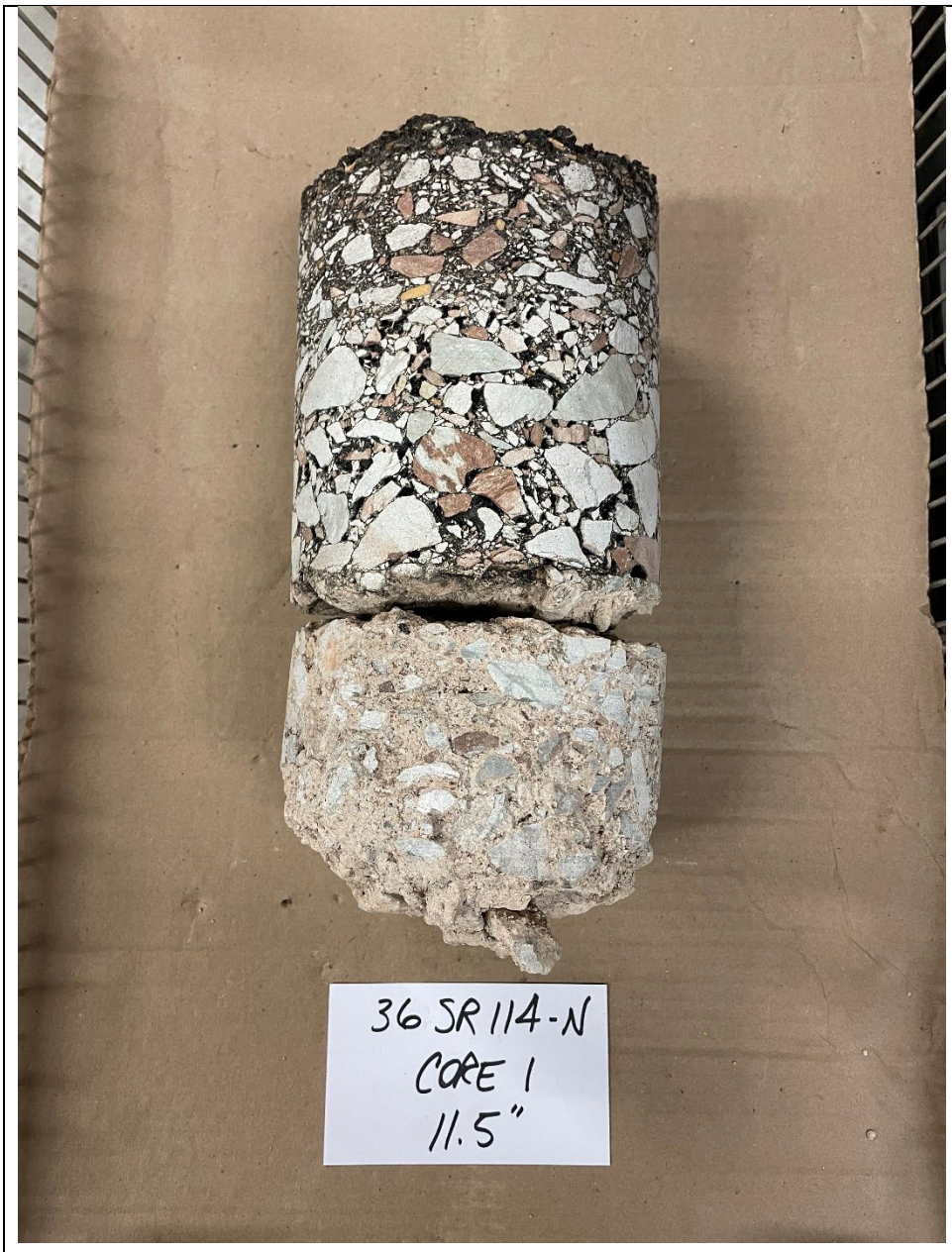
Number: 4

Thickness: 8”

Region: 3

County: Sumner

JMF No. 3190178



Core Label: 36SR114N

Number: 1

Thickness: 11.5”

Region:4

County: Hardin

JMF No. 4190198

Core Label: 36SR114N

Number: 2

Thickness: 17.5”

Region: 4

County: Hardin

JMF No. 4190198

Core Label: 36SR114N

Number: 3

Thickness: 14.5”

Region: 4

County: Hardin

JMF No. 4190198

Core Label: 36SR114N

Number: 4

Thickness: 15”

Region: 4

County: Hardin

JMF No. 4190198

Core Label: 83SR174

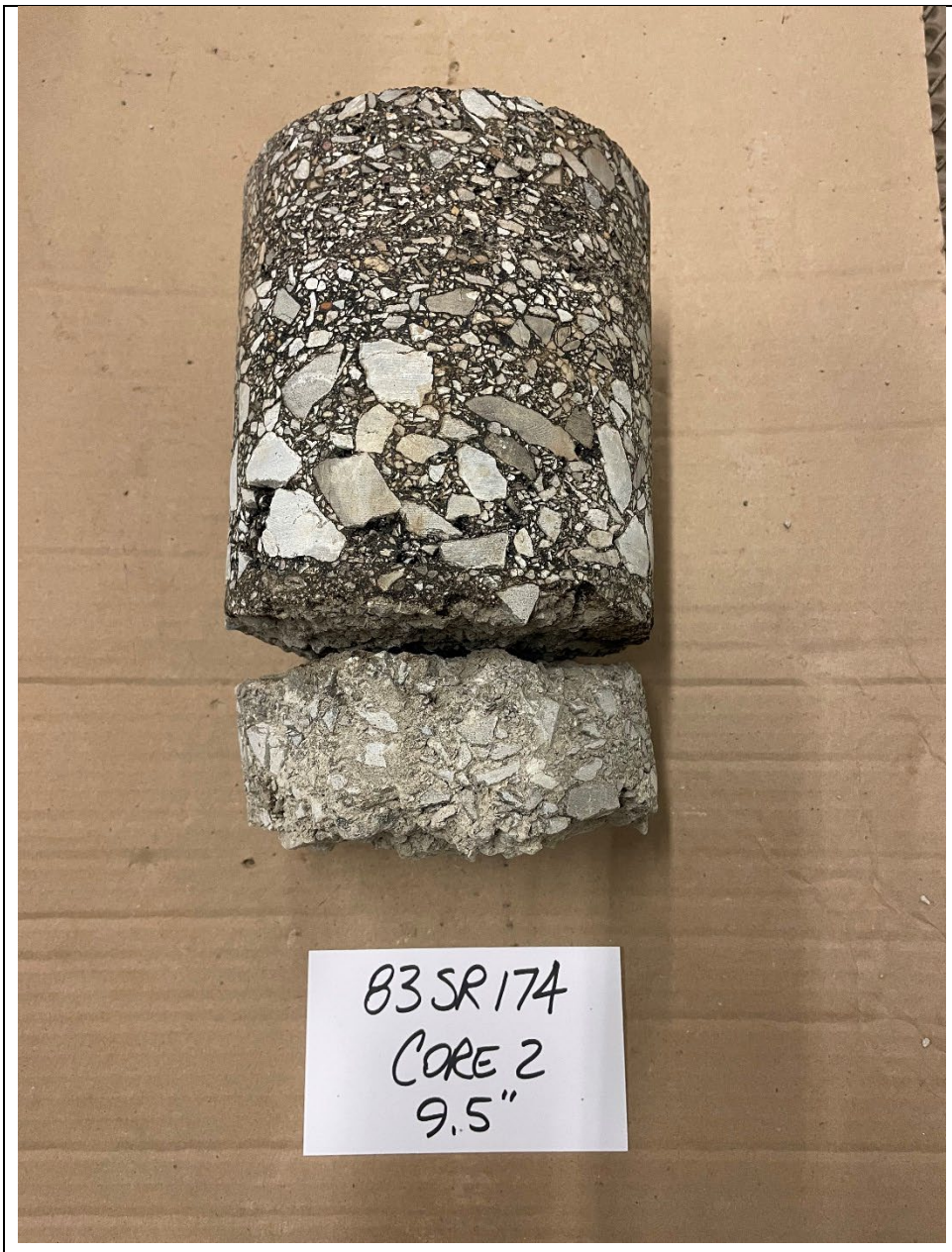
Number: 1

Thickness: 9.5”

Region: 3

County: Sumner

JMF No. 3190178



Core Label: 83SR174

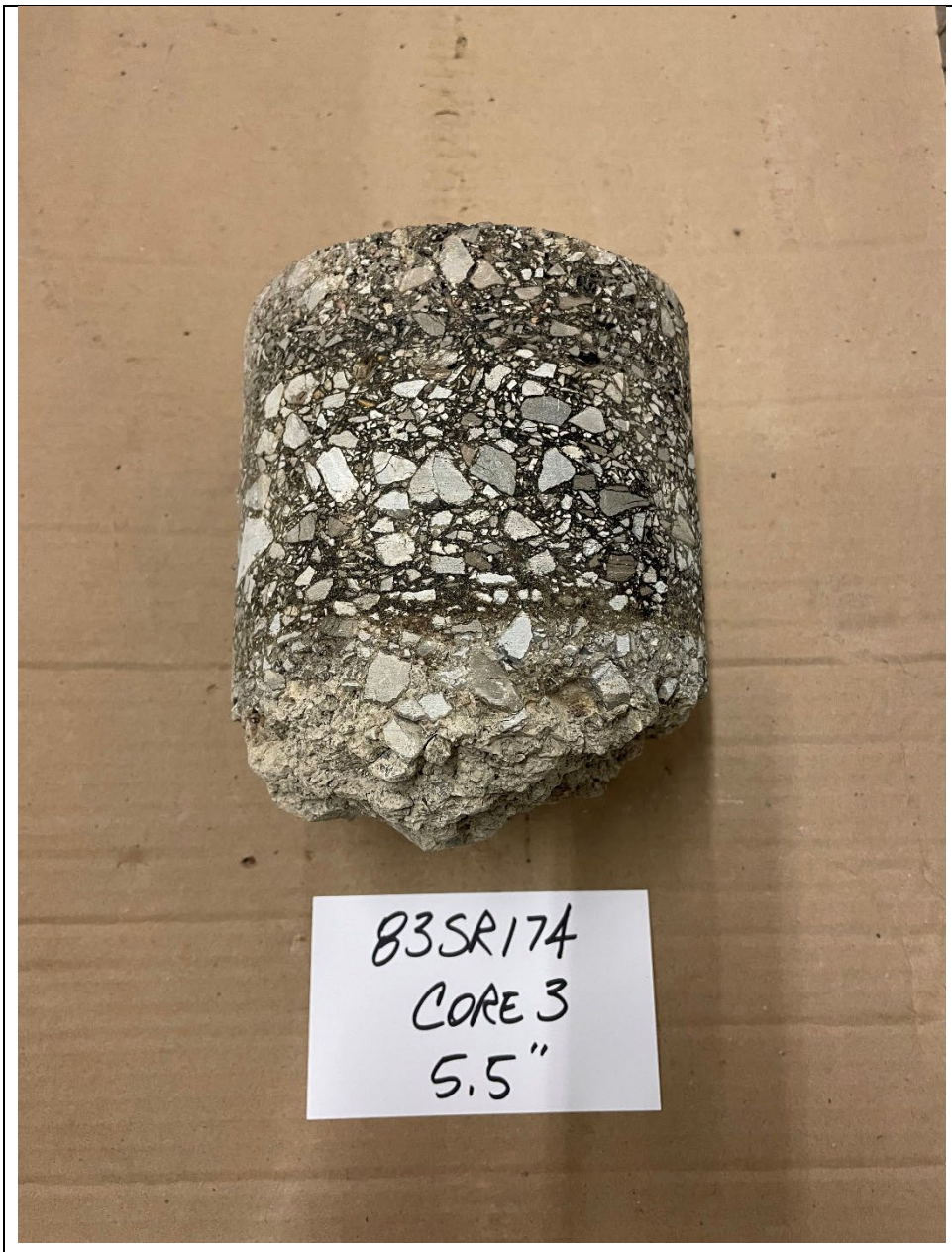
Number: 2

Thickness: 9.5”

Region: 3

County: Sumner

JMF No. 3190178



Core Label: 83SR174

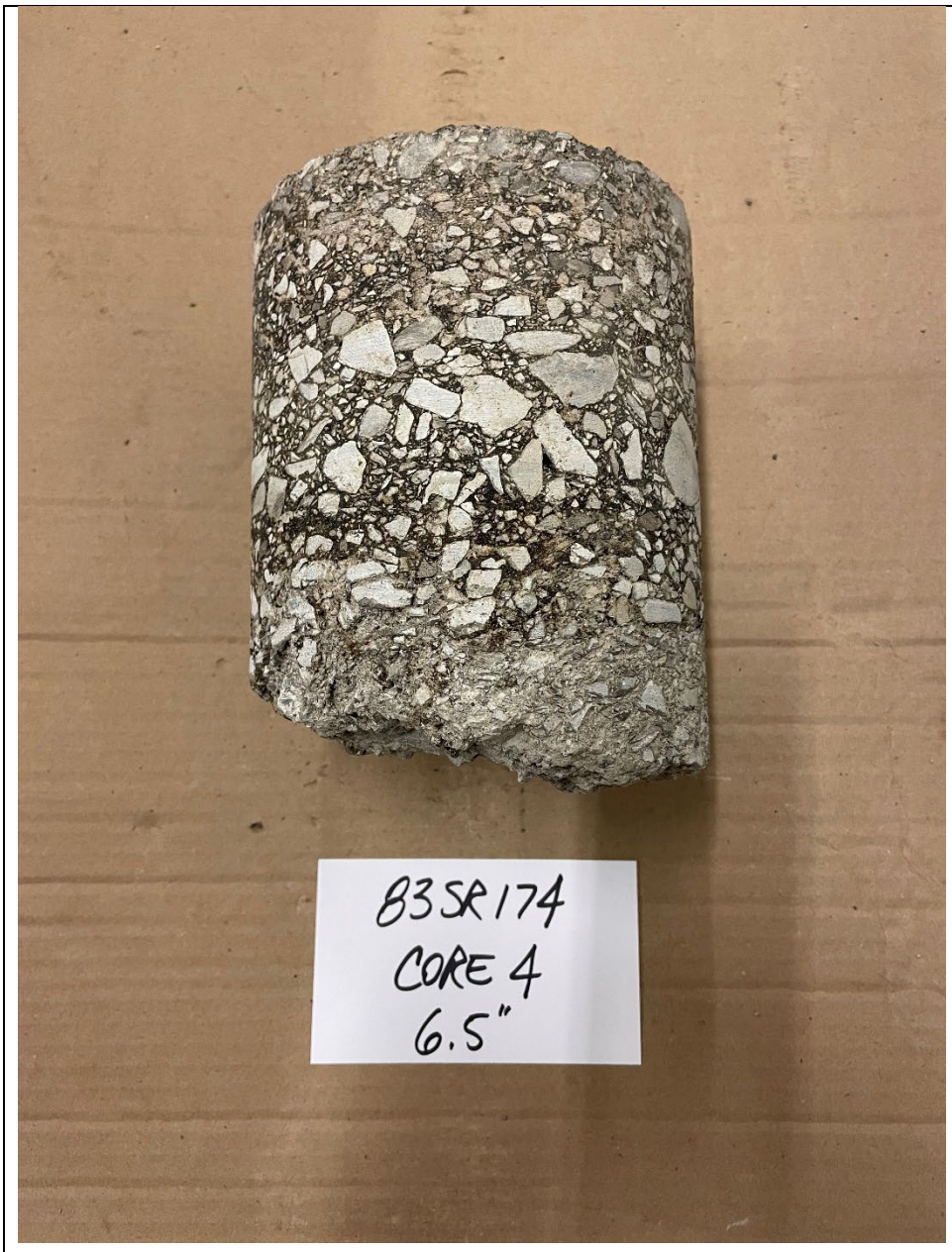
Number: 3

Thickness: 5.5”

Region: 3

County: Sumner

JMF No. 3190178



Core Label: 83SR174

Number: 4

Thickness: 6.5”

Region: 3

County: Sumner

JMF No. 3190178

Core Label:83SR174

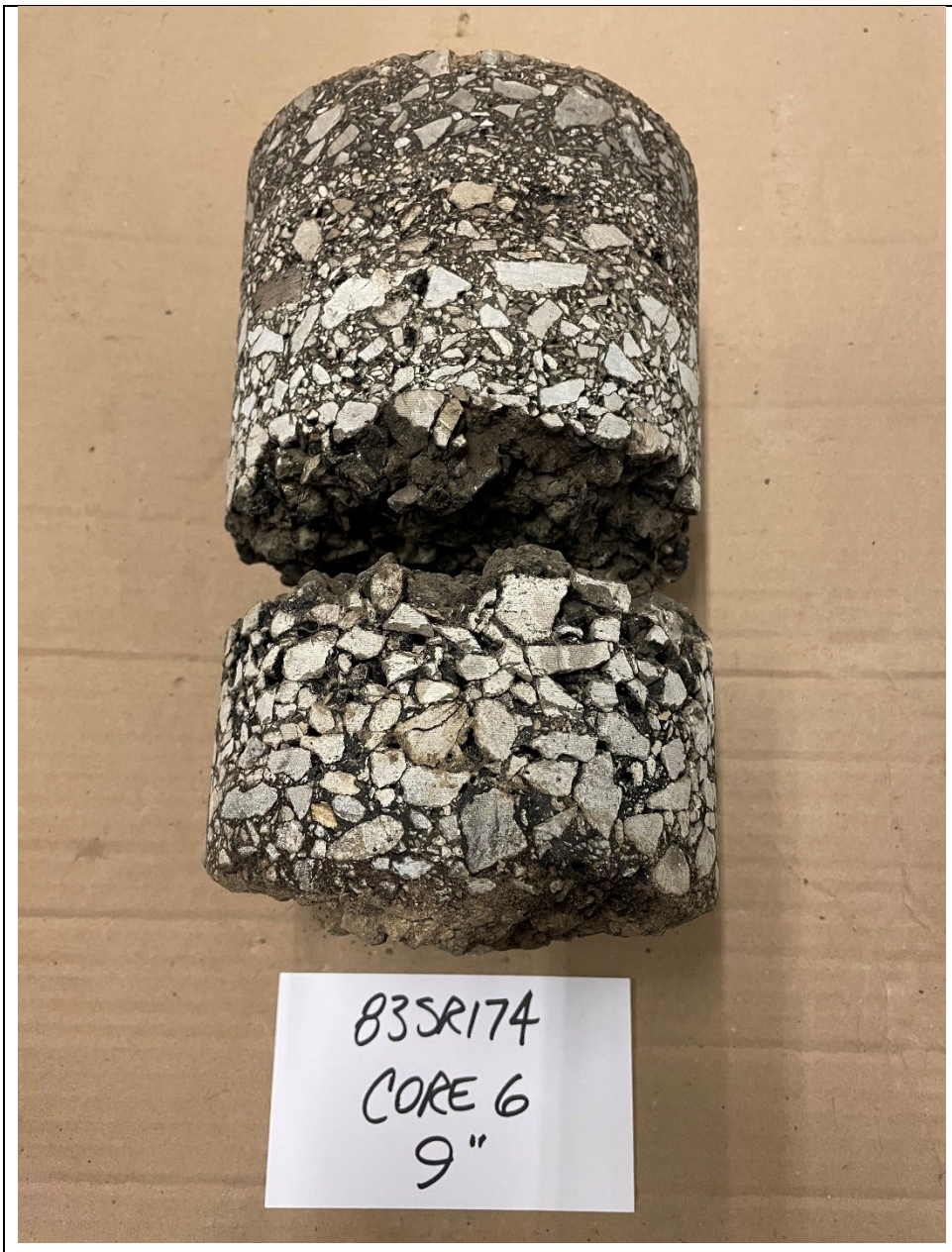
Number: 5

Thickness: 10.5”

Region: 3

County: Sumner

JMF No. 3190178



Core Label: 83SR174

Number: 6

Thickness: 9”

Region: 3

County: Sumner

JMF No. 3190178

Core Label: 83SR174

Number: 7

Thickness: 11”

Region: 3

County: Sumner

JMF No. 3190178

Core Label: 83SR174

Number: 8

Thickness: 8”

Region: 3

County: Sumner

JMF No. 3190178

Core Label: 85SR376

Number: 1

Thickness: 15”

Region: 3

County: Trousdale

JMF No. 3190178

Core Label: 85SR376

Number: 2

Thickness: 17”

Region: 3

County: Trousdale

JMF No. 3190178

Core Label: 85SR376

Number: 3

Thickness: 18”

Region: 3

County: Trousdale

JMF No. 3190178

Core Label: 85SR376

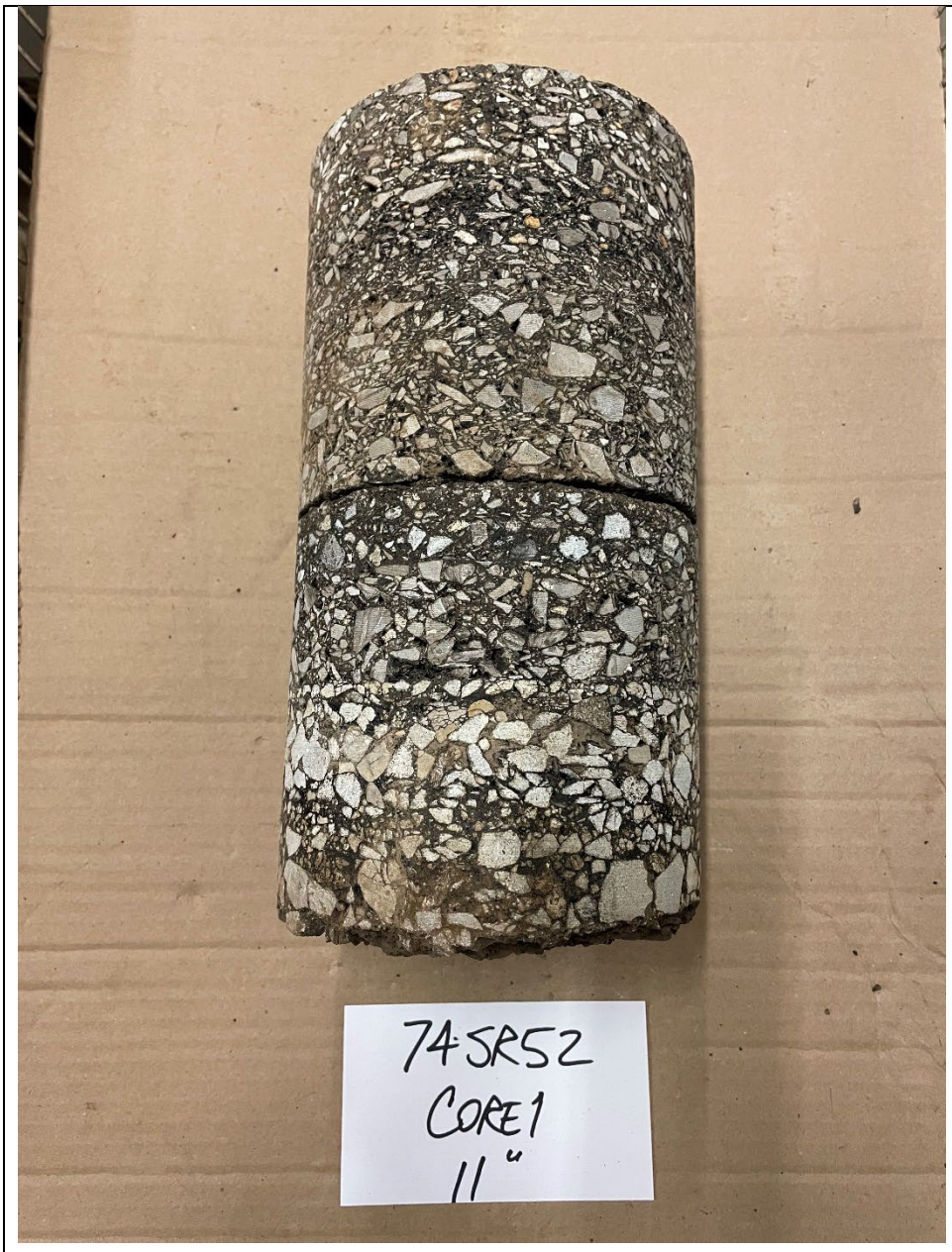
Number: 4

Thickness: 20”

Region: 3

County: Trousdale

JMF No. 3190178



Core Label: 74SR52

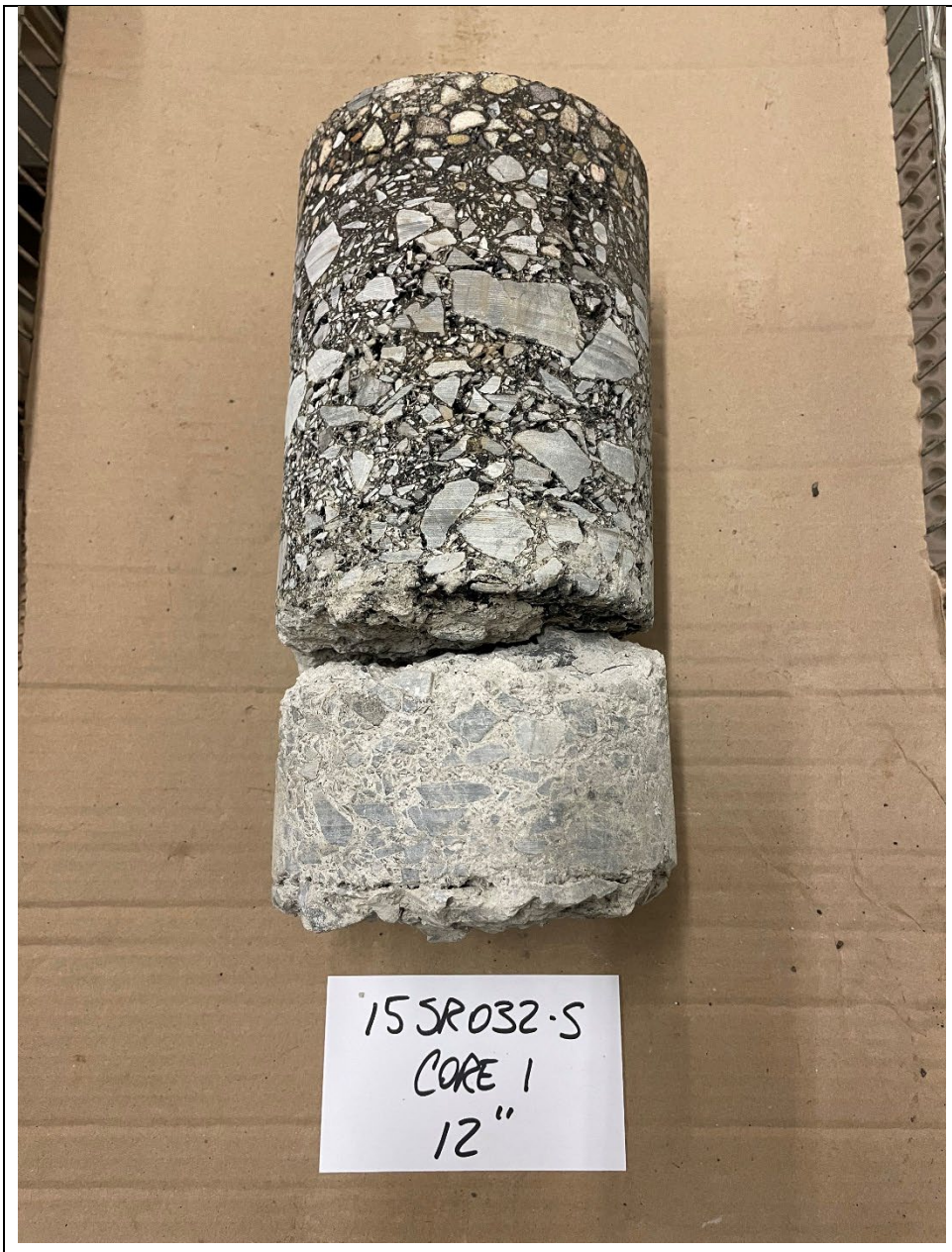
Number: 1

Thickness: 11”

Region:3

County: Robertson

JMF No. 3190178



Core Label: 15SR032S

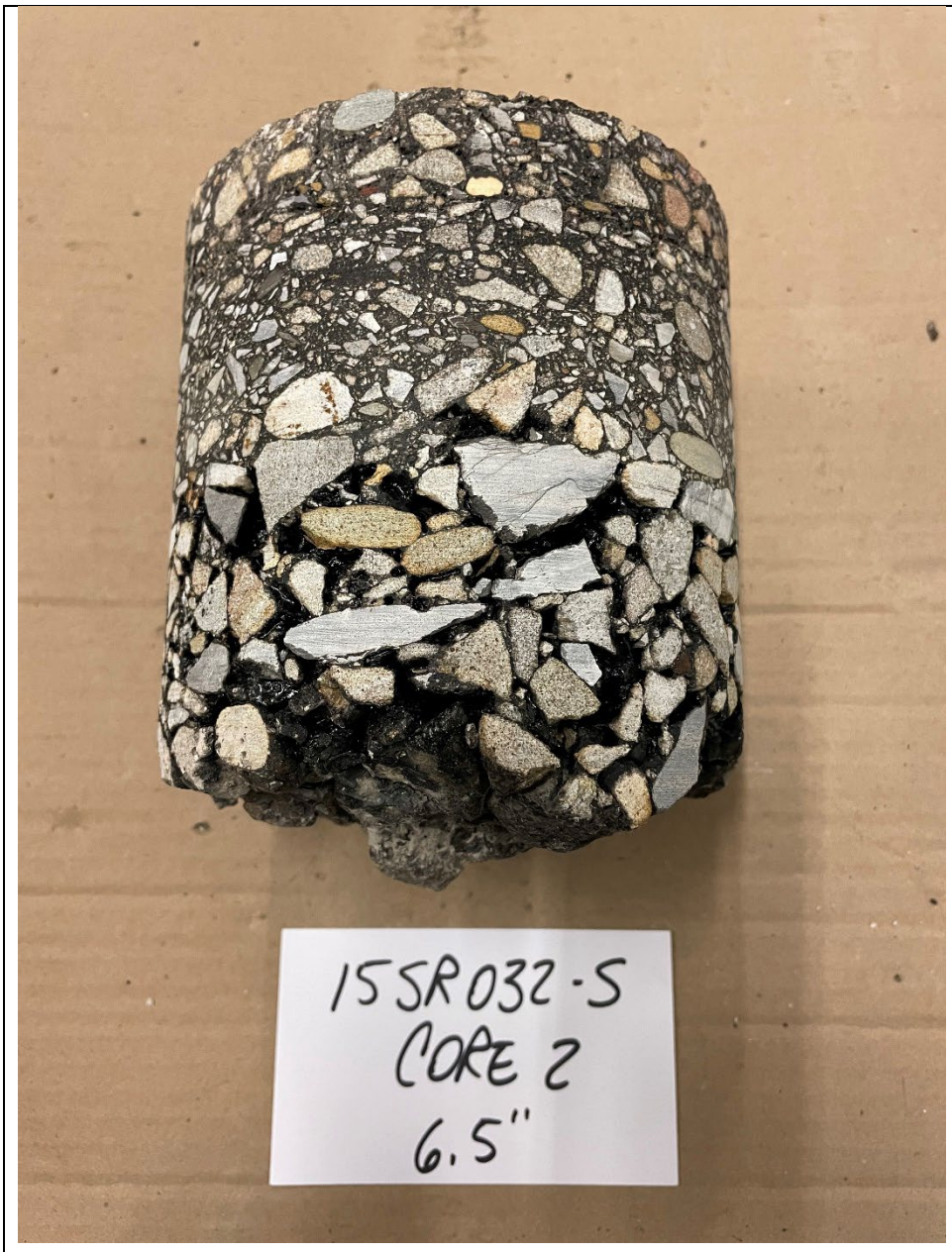
Number: 1

Thickness: 12”

Region: 1

County: Cocke

JMF No. 1190325



Core Label: 15SR032S

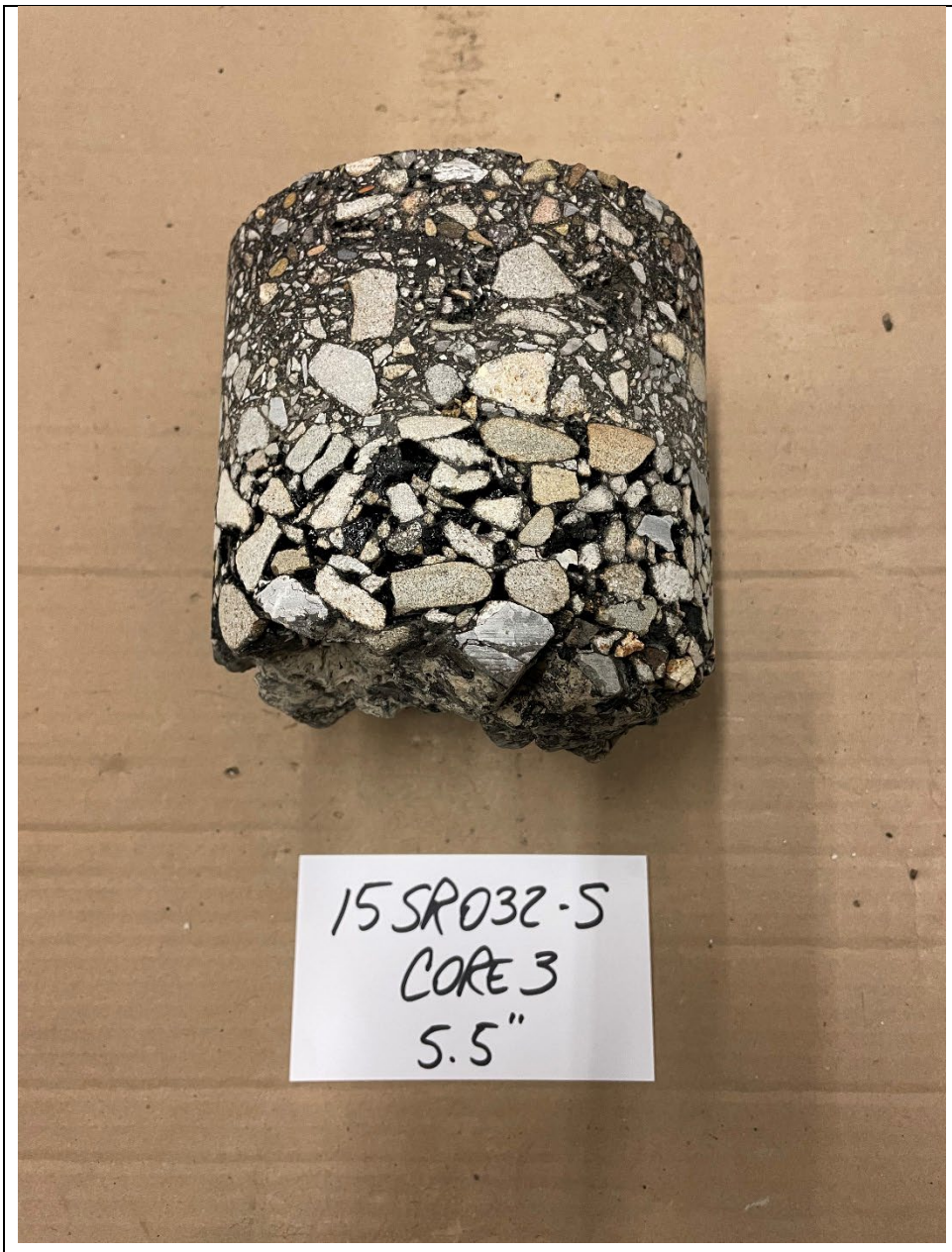
Number: 2

Thickness: 6.5”

Region: 1

County: Cocke

JMF No. 1190325



Core Label: 15SR032S

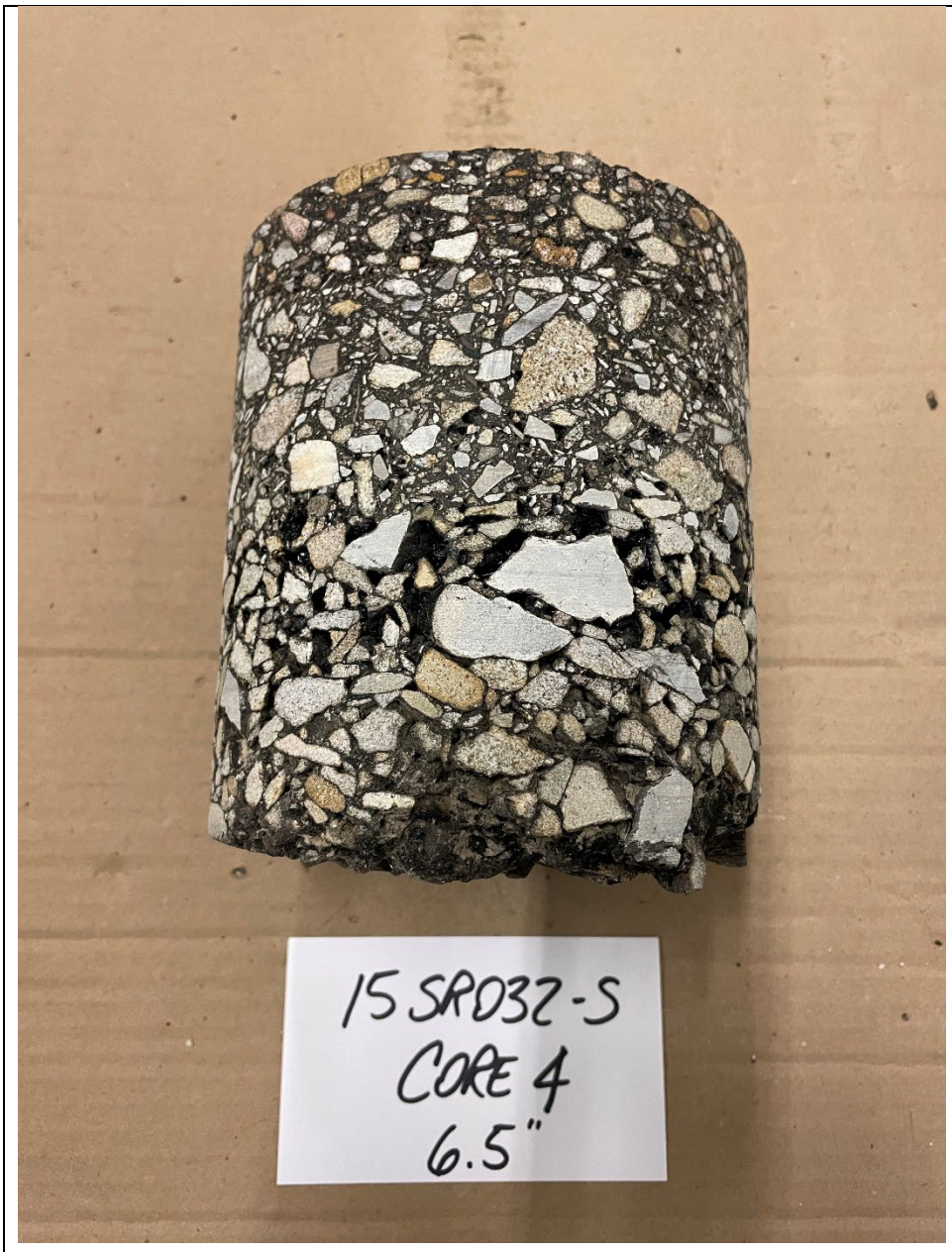
Number: 3

Thickness: 5.5”

Region: 1

County: Cocke

JMF No. 1190325



Core Label: 15SR032S

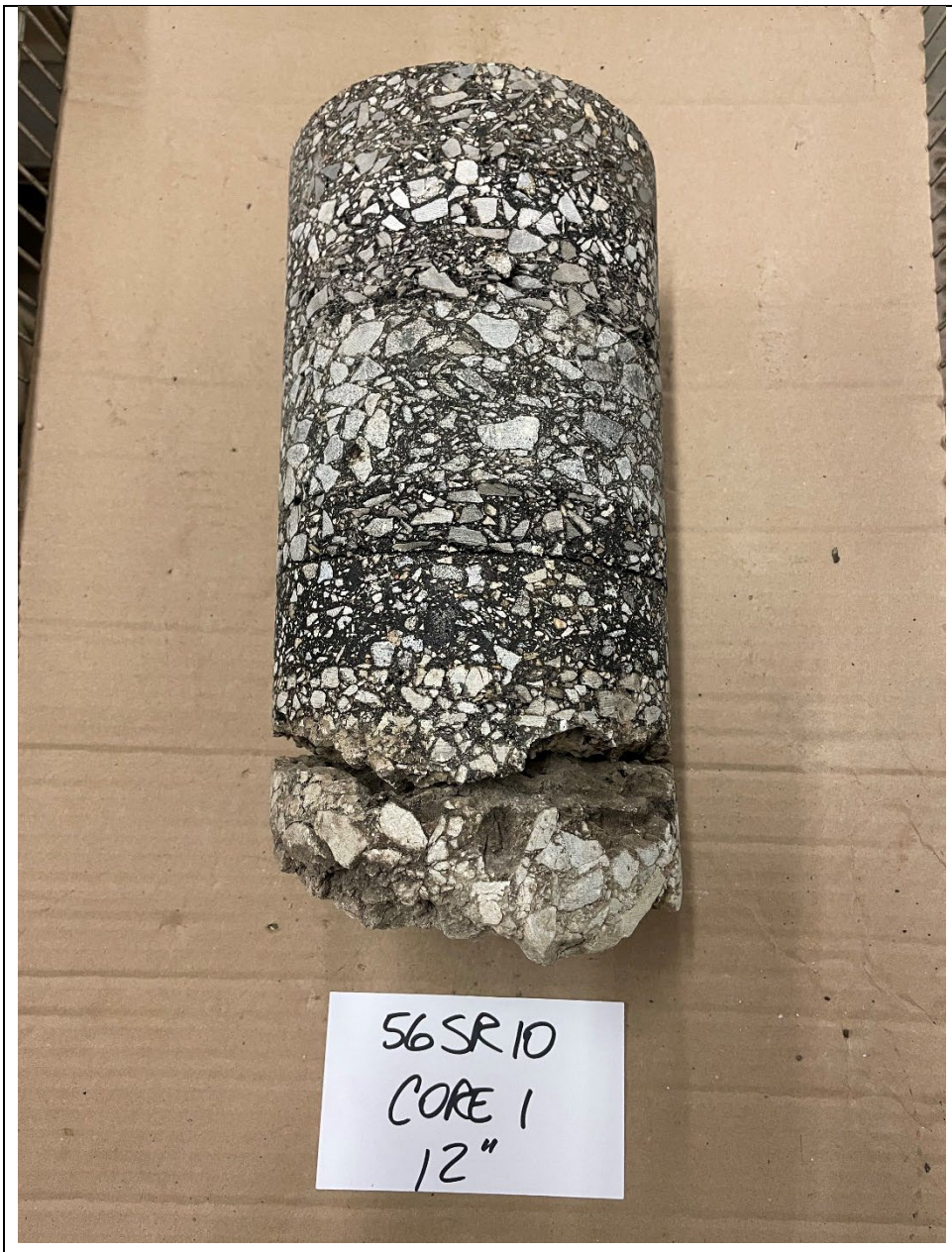
Number: 4

Thickness: 6.5”

Region: 1

County: Cocke

JMF No. 1190325



Core Label: 56SR10

Number: 1

Thickness: 12”

Region: 3

County: Macon

JMF No. 3190178

Core Label: 56SR10

Number: 2

Thickness: 12”

Region: 3

County: Macon

JMF No. 3190178

Core Label: 56SR10

Number: 3

Thickness: 11.5”

Region: 3

County: Macon

JMF No. 3190178

Core Label: 56SR10

Number: 4

Thickness: 12.5”

Region: 3

County: Macon

JMF No. 3190178

Core Label: 74SR52

Number: 2

Thickness: 10.75”

Region: 3

County: Robertson

JMF No. 3190178

Core Label: 74SR52W

Number: 3

Thickness: 13”

Region: 3

County: Robertson

JMF No. 3190178

Core Label: 74SR52W

Number: 4

Thickness: 16.5”

Region: 3

County: Robertson

JMF No. 3190178

Core Label: 36SR128S

Number: 1

Thickness: 10.5”

Region: 4

County: Hardin

JMF No. 4190198

Core Label: 36SR128S

Number: 2

Thickness: 12”

Region: 4

County: Hardin

JMF No. 4190198

Core Label: 36SR128S

Number: 3

Thickness: 13.5”

Region: 4

County: Hardin

JMF No. 4190198

Core Label: 36SR128S

Number: 4

Thickness: 13”

Region: 4

County: Hardin

JMF No. 4190198

Core Label: 45/15 SR035 NE

Number: 1

Thickness: 8.5”

Region: 1

County: Jefferson / Cocke

JMF No. 1190325

Core Label: 45/15 SR035 NE

Number: 2

Thickness: 15.5”

Region: 1

County: Jefferson / Cocke

JMF No. 1190325

Core Label: 45/15 SR035 NE

Number: 3

Thickness: 9.5”

Region: 1

County: Jefferson / Cocke

JMF No. 1190325

Core Label: 45/15 SR035 NE

Number: 4

Thickness: 9.5”

Region: 1

County: Jefferson / Cocke

JMF No. 1190325

Appendix C: Collected and Compiled Data Tables

Pill Designation	SE65.7-2-1	SE65.7-2-2	SE65.7-2-3	SE65.7-2-6	SE65.7-2-4	SE65.7-2-5	SE65.7-2-7
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	SE6	SE6	SE6	SE6	SE6	SE6	SE6
Mix ID	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190099	2190099	2190099	2190099	2190099	2190099	2190099
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2471.2	2476.5	2479.3	2470.3	2478.5	2478.8	2480.6
Submerged Weight, g (B)	1403.4	1414.8	1420.2	1414.4	1412.4	1424.5	1422.7
SSD Weight, g (C)	2482.4	2487.7	2490.4	2482.7	2489.7	2492.2	2491.9
Bulk Specific Gravity, Gmb	2.290	2.308	2.317	2.312	2.301	2.322	2.320
% Water Absorbed by Volume	1.0	1.0	1.0	1.2	1.0	1.3	1.1
Theoretical Maximum Density, Gmm	2.490	2.490	2.490	2.490	2.490	2.490	2.490
% Voids in Total Mix (VTM)	**8.0**	**7.3**	**7.0**	**7.1**	**7.6**	**6.8**	**6.8**
% Compaction	92.0	92.7	93.0	92.9	92.4	93.2	93.2
Specimen Average Thickness (mm)	*62.0*				*62.0*		
Performance Test	Ideal-RT		HWT	HWT	Ideal RT	HWT	HWT
Date Sent	1/7/2020				1/9/2020		
To Whom	Cynthia				Cynthia		
Ideal-RT Load (KN)	3.344				3.036		
Ideal-RT Shear Strength (MPa)	1.011	#DIV/0!	#DIV/0!	#DIV/0!	0.918	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)			2.08			3.43	
HWT Rut Depth @ 10,000 passes (mm)			4.18			14.21	
HWT Rut Depth @ 20,000 passes (mm)			36.96			FAIL	
HWT Creep Slope			5.95E-05			0.0002128	
HWT Stripping Slope			0.00342			0.00706	
Stripping Inflection Point (SIP)			10096			8604	
Stripping Number (LC_{SN})			9988			8000	
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)			9.47E-07			1.69E-07	
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})			-			-	
Corrected $RD_{10,000}$			11.28			11.28	
Corrected $RD_{20,000}$			13.98			13.98	
Terminal Rut Depth (mm)			6.18			17.72	
Terminal Rut Depth (in)			0.24			0.70	
Terminal Wheel Passes (N_{max})			11000			11000	
Rutting Resistance Index (RRI)			8324			3326	
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	SE65.7-2-8	SE65.7-2-9	SE65.7-2-10	SE65.7-2-11	SE65.7-2-12	SE65.7-4-1	SE65.7-4-2
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	SE6	SE6	SE6	SE6	SE6	SE6	SE6
Mix ID	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190099	2190099	2190099	2190099	2190099	2190099	2190099
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2481.8	2478.5	2478.2	2482.7	2480.4	2480.8	2482.4
Submerged Weight, g (B)	1424.2	1414	1416.2	1422.3	1417.1	1423	1423.2
SSD Weight, g (C)	2493.3	2485.9	2491.8	2490.3	2490.9	2493.3	2494.8
Bulk Specific Gravity, Gmb	2.321	2.312	2.304	2.325	2.310	2.318	2.317
% Water Absorbed by Volume	1.1	0.7	1.3	0.7	1.0	1.2	1.2
Theoretical Maximum Density, Gmm	2.490	2.490	2.490	2.490	2.490	2.490	2.490
% Voids in Total Mix (VTM)	**6.8**	**7.1**	**7.5**	**6.6**	**7.2**	**6.9**	**7.0**
% Compaction	93.2	92.9	92.5	93.4	92.8	93.1	93.0
Specimen Average Thickness (mm)	*62.0*	*62.0*	*62.0*	*62.0*		61.96	61.91
Performance Test	Ideal RT	Ideal RT	Ideal RT	Ideal RT		Ideal CT	Ideal CT
Date Sent	1/7/2020	1/9/2020	1/7/2020	1/9/2020			
To Whom	Cynthia	Cynthia	Cynthia	Cynthia		Ingevity	Ingevity
Ideal-RT Load (KN)	3.351	3.619	3.564	3.653			
Ideal-RT Shear Strength (MPa)	1.013	1.094	1.077	1.104	#DIV/0!	0.000	0.000
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						9082	8690
Ideal-CT Post-Peak Slope (S)						3.65	3.60
Ideal-CT G_f/S						2489	2413
Displacement (mm)						5.26	4.96
Ideal-CT - CT Index						87	80

Pill Designation	SE65.7-4-3	SE65.7-4-4	SE65.7-4-5	SE65.7-4-6
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1
TT Mix Code	SE6	SE6	SE6	SE6
Mix ID	D1	D1	D1	D1
Mix Type	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190099	2190099	2190099	2190099
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2482.2	2482.3	2479.6	2482.4
Submerged Weight, g (B)	1422.6	1422.6	1419.5	1427
SSD Weight, g (C)	2494.1	2495.2	2490.2	2497.3
Bulk Specific Gravity, Gmb	2.317	2.314	2.316	2.319
% Water Absorbed by Volume	1.1	1.2	1.0	1.4
Theoretical Maximum Density, Gmm	2.490	2.490	2.490	2.490
% Voids in Total Mix (VTM)	**7.0**	**7.1**	**7.0**	**6.9**
% Compaction	93.0	92.9	93.0	93.1
Specimen Average Thickness (mm)	61.89	61.93		
Performance Test	Ideal CT	Ideal CT		
Date Sent				
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	0.000	0.000	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	9254	8425		
Ideal-CT Post-Peak Slope (S)	3.02	3.23		
Ideal-CT G_f/S	3069	2605		
Displacement (mm)	5.63	5.17		
Ideal-CT - CT Index	115	90		

Pill Designation	SE66.2-2-1	SE66.2-2-2	SE66.2-2-3	SE66.2-2-4	SE66.2-2-5	SE66.2-2-6	SE66.2-2-7	SE66.2-2-8
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1	1
TT Mix Code	SE6	SE6	SE6	SE6	SE6	SE6	SE6	SE6
Mix ID	D1	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190099	2190099	2190099	2190099	2190099	2190099	2190099	2190099
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Age Time	2	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2444.4	2442	2440	2441.3	2444.5	2439.7	2440.7	2442.2
Submerged Weight, g (B)	1381.6	1386.6	1376.8	1387.2	1390.9	1387.3	1388.5	1392.8
SSD Weight, g (C)	2453.9	2460.3	2451.8	2455.6	2461.8	2455.8	2449	2456.2
Bulk Specific Gravity, Gmb	2.280	2.274	2.270	2.285	2.283	2.283	2.301	2.297
% Water Absorbed by Volume	0.9	1.7	1.1	1.3	1.6	1.5	0.8	1.3
Theoretical Maximum Density, Gmm	2.471	2.471	2.471	2.471	2.471	2.471	2.471	2.471
% Voids in Total Mix (VTM)	7.7	8.0	8.1	7.5	7.6	7.6	6.9	7.1
% Compaction	92.3	92.0	91.9	92.5	92.4	92.4	93.1	92.9
Specimen Average Thickness (mm)		*62.0*	*62.0*					
Performance Test		Ideal RT	Ideal RT				HWT	HWT
Date Sent		1/9/2020	1/9/2020					
To Whom		Cynthia	Cynthia					
Ideal-RT Load (KN)		2.677	2.567					
Ideal-RT Shear Strength (MPa)	#DIV/0!	0.809008489	0.775765705	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							6.51	
HWT Rut Depth @ 10,000 passes (mm)							27.11	
HWT Rut Depth @ 20,000 passes (mm)							FAIL	
HWT Creep Slope							0.0007492	
HWT Stripping Slope							0.005542	
Stripping Inflection Point (SIP)							6289	
Stripping Number (LC_{SN})							1666	
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							1.20E-05	
Stripping Strain (ε^{vt})								
Stripping Life (LC_{ST})							6785	
Corrected $RD_{10,000}$							6.32	
Corrected $RD_{20,000}$							7.94	
Terminal Rut Depth (mm)							16.03	
Terminal Rut Depth (in)							0.63	
Terminal Wheel Passes (N_{max})							8000	
Rutting Resistance Index (RRI)							2951	
Ideal-CT Fracture Energy (G_f)								
Ideal-CT Post-Peak Slope (S)								
Ideal-CT G_f/S								
Displacement (mm)								
Ideal-CT - CT Index								

Pill Designation	SE66.2-2-9	SE66.2-2-10	SE66.2-2-11	SE66.2-2-12	SE66.2-2-13	SE66.2-2-14
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1
TT Mix Code	SE6	SE6	SE6	SE6	SE6	SE6
Mix ID	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190099	2190099	2190099	2190099	2190099	2190099
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2
Age Time	2	2	2	2	2	2
Dry Weight in Air, g (A)	2439.6	2438.5	2440.6	2435.6	2447.2	2447
Submerged Weight, g (B)	1377.3	1385.2	1388.8	1386.9	1382.6	1384.8
SSD Weight, g (C)	2449.5	2454.5	2455.8	2451.6	2458.3	2454.8
Bulk Specific Gravity, Gmb	2.275	2.280	2.287	2.288	2.275	2.287
% Water Absorbed by Volume	0.9	1.5	1.4	1.5	1.0	0.7
Theoretical Maximum Density, Gmm	2.471	2.471	2.471	2.471	2.471	2.471
% Voids in Total Mix (VTM)	**7.9**	**7.7**	**7.4**	**7.4**	**7.9**	**7.4**
% Compaction	92.1	92.3	92.6	92.6	92.1	92.6
Specimen Average Thickness (mm)	*62.0*	*62.0*				
Performance Test	Ideal RT	Ideal RT	HWT	HWT		
Date Sent	1/9/2020	1/9/2020				
To Whom	Cynthia	Cynthia				
Ideal-RT Load (KN)	2.75	2.841				
Ideal-RT Shear Strength (MPa)	0.83106961	0.858570458	#DIV/0!	#DIV/0!		
HWT Rut Depth @ 5,000 passes (mm)			5.25			
HWT Rut Depth @ 10,000 passes (mm)			12.76			
HWT Rut Depth @ 20,000 passes (mm)			55.86			
HWT Creep Slope			0.0004478			
HWT Stripping Slope			0.004324			
Stripping Inflection Point (SIP)			8707			
Stripping Number (LC_{SN})			1666			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)			1.24E-05			
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})			6724			
Corrected $RD_{10,000}$			6.53			
Corrected $RD_{20,000}$			8.20			
Terminal Rut Depth (mm)			16.94			
Terminal Rut Depth (in)			0.67			
Terminal Wheel Passes (N_{max})			11000			
Rutting Resistance Index (RRI)			3664			
Ideal-CT Fracture Energy (G_f)						
Ideal-CT Post-Peak Slope (S)						
Ideal-CT G_f/S						
Displacement (mm)						
Ideal-CT - CT Index						

Pill Designation	SE66.2-2-15	SE66.2-2-16	SE66.2-4-1	SE66.2-4-2	SE66.2-4-3	SE66.2-4-4	SE66.2-4-5	SE66.2-4-6
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1	1
TT Mix Code	SE6	SE6	SE6	SE6	SE6	SE6	SE6	SE6
Mix ID	D1	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190099	2190099	2190099	2190099	2190099	2190099	2190099	2190099
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Age Time	2	2	4	4	4	4	4	4
Dry Weight in Air, g (A)	2447.9	2446.1	2440.6	2440.1	2438	2440.5	2439.3	2438.4
Submerged Weight, g (B)	1388.5	1386.5	1389.2	1389.1	1384.3	1387.3	1389.4	1380.6
SSD Weight, g (C)	2458.2	2454.9	2457.8	2458	2450.8	2457.2	2459.5	2450.8
Bulk Specific Gravity, Gmb	2.288	2.289	2.284	2.283	2.286	2.281	2.280	2.278
% Water Absorbed by Volume	1.0	0.8	1.6	1.7	1.2	1.6	1.9	1.2
Theoretical Maximum Density, Gmm	2.471	2.471	2.471	2.471	2.471	2.471	2.471	2.471
% Voids in Total Mix (VTM)	7.4	7.3	7.6	7.6	7.5	7.7	7.7	7.8
% Compaction	92.6	92.7	92.4	92.4	92.5	92.3	92.3	92.2
Specimen Average Thickness (mm)								
Performance Test					Ideal CT			
Date Sent								
To Whom					Ingevity			
Ideal-RT Load (KN)								
Ideal-RT Shear Strength (MPa)			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)								
HWT Rut Depth @ 10,000 passes (mm)								
HWT Rut Depth @ 20,000 passes (mm)								
HWT Creep Slope								
HWT Stripping Slope								
Stripping Inflection Point (SIP)								
Stripping Number (LC_{SN})								
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)								
Stripping Strain (ε^{vt})								
Stripping Life (LC_{ST})								
Corrected $RD_{10,000}$								
Corrected $RD_{20,000}$								
Terminal Rut Depth (mm)								
Terminal Rut Depth (in)								
Terminal Wheel Passes (N_{max})								
Rutting Resistance Index (RRI)								
Ideal-CT Fracture Energy (G_f)			9178	8241	8321	9496		
Ideal-CT Post-Peak Slope (S)			2.81	2.75	2.53	2.21		
Ideal-CT G_f/S			3265	2999	3294	4297		
Displacement (mm)			5.92	5.39	5.99	5.99		
Ideal-CT - CT Index			129	108	132	171		

Pill Designation	SE75.7-2-2	SE75.7-2-1	SE75.7-2-3	SE75.7-2-4	SE75.7-2-5	SE75.7-2-6	SE75.7-2-7
Date Compacted	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019
Mix Number	3	3	3	3	3	3	3
TT Mix Code	SE7	SE7	SE7	SE7	SE7	SE7	SE7
Mix ID	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190101	2190101	2190101	2190101	2190101	2190101	2190101
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2500.7	2474.8	2466.4	2478.6	2476.9	2479.2	2477.3
Submerged Weight, g (B)	1439.6	1409.9	1415.2	1419.9	1421.4	1422.6	1426.6
SSD Weight, g (C)	2508.3	2482.8	2480.7	2489.2	2488.8	2495.5	2490.2
Bulk Specific Gravity, Gmb	2.340	2.307	2.315	2.318	2.320	2.311	2.329
% Water Absorbed by Volume	0.7	0.7	1.3	1.0	1.1	1.5	1.2
Theoretical Maximum Density, Gmm	2.490	2.490	2.490	2.490	2.490	2.490	2.490
% Voids in Total Mix (VTM)	**6.0**	**7.4**	**7.0**	**6.9**	**6.8**	**7.2**	**6.5**
% Compaction	94.0	92.6	93.0	93.1	93.2	92.8	93.5
Specimen Average Thickness (mm)	61.91					62.0	61.7
Performance Test	Ideal RT	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT
Date Sent	1/7/2020					1/7/2020	1/7/2020
To Whom	Cynthia					Cynthia	Cynthia
Ideal-RT Load (KN)	5.224					4.589	5.047
Ideal-RT Shear Strength (MPa)	1.581	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.387	1.533
HWT Rut Depth @ 5,000 passes (mm)		1.77		1.64			
HWT Rut Depth @ 10,000 passes (mm)		2.13		1.98			
HWT Rut Depth @ 20,000 passes (mm)		2.63		2.74			
HWT Creep Slope		-1.23E-05		4.11E-05			
HWT Stripping Slope		-1.24E-05		1.15E-04			
Stripping Inflection Point (SIP)		20992		15080			
Stripping Number (LC_{SN})		>20002		>20002			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)		5.38E-07		5.65E-07			
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})		-		-			
Corrected $RD_{10,000}$		2.15		2.02			
Corrected $RD_{20,000}$		2.58		2.47			
Terminal Rut Depth (mm)		2.62		2.73			
Terminal Rut Depth (in)		0.10		0.11			
Terminal Wheel Passes (N_{max})		20002		20002			
Rutting Resistance Index (RRI)		17939		17852			
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	SE75.7-2-8	SE75.7-2-9	SE75.7-2-10	SE75.7-2-11	SE75.7-2-12	SE75.7-4-1	SE75.7-4-2
Date Compacted	11/21/2019						11/21/2019
Mix Number	3	3	3	3	3	3	3
TT Mix Code	SE7	SE7	SE7	SE7	SE7	SE7	SE7
Mix ID	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190101	2190101	2190101	2190101	2190101	2190101	2190101
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2476.7					2481.1	2475.9
Submerged Weight, g (B)	1429.5					1426.9	1422.5
SSD Weight, g (C)	2495					2495.1	2491.4
Bulk Specific Gravity, Gmb	2.324	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.323	2.316
% Water Absorbed by Volume	1.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.3	1.5
Theoretical Maximum Density, Gmm	2.490	2.490	2.490	2.490	2.490	2.490	2.490
% Voids in Total Mix (VTM)	6.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6.7	7.0
% Compaction	93.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.3	93.0
Specimen Average Thickness (mm)	61.8						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/7/2020						
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	4.668						
Ideal-RT Shear Strength (MPa)	1.415	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						10629	10942
Ideal-CT Post-Peak Slope (S)						7.65	5.86
Ideal-CT G_f/S						1389	1866
Displacement (mm)						4.28	4.87
Ideal-CT - CT Index						40	61

Pill Designation	SE75.7-4-3	SE75.7-4-4	SE75.7-4-5	SE75.7-4-6
Date Compacted	11/21/2019	11/21/2019		
Mix Number	3	3	3	3
TT Mix Code	SE7	SE7	SE7	SE7
Mix ID	D1	D1	D1	D1
Mix Type	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190101	2190101	2190101	2190101
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2473.8	2477.1		
Submerged Weight, g (B)	1415.8	1425.2		
SSD Weight, g (C)	2485.1	2493.4		
Bulk Specific Gravity, Gmb	2.313	2.319	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.1	1.5	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.490	2.490	2.490	2.490
% Voids in Total Mix (VTM)	**7.1**	**6.9**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.9	93.1	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent				
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	9628	8782		
Ideal-CT Post-Peak Slope (S)	6.84	7.09		
Ideal-CT G_f/S	1407	1239		
Displacement (mm)	4.78	3.90		
Ideal-CT - CT Index	45	32		

Pill Designation	SE76.2-2-1	SE76.2-2-2	SE76.2-2-3	SE76.2-2-4	SE76.2-2-5	SE76.2-2-6	SE76.2-2-7
Date Compacted	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	SE7	SE7	SE7	SE7	SE7	SE7	SE7
Mix ID	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190101	2190101	2190101	2190101	2190101	2190101	2190101
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2441.4	2444.3	2439.5	2442.5	2447	2443.6	2442.5
Submerged Weight, g (B)	1396.1	1391.6	1393.1	1397	1401.6	1400.9	1394.8
SSD Weight, g (C)	2458.1	2461.4	2452.7	2458.9	2462.5	2462.3	2454.4
Bulk Specific Gravity, Gmb	2.299	2.285	2.302	2.300	2.307	2.302	2.305
% Water Absorbed by Volume	1.6	1.6	1.2	1.5	1.5	1.8	1.1
Theoretical Maximum Density, Gmm	2.471	2.471	2.471	2.471	2.471	2.471	2.471
% Voids in Total Mix (VTM)	**7.0**	**7.5**	**6.8**	**6.9**	**6.7**	**6.8**	**6.7**
% Compaction	93.0	92.5	93.2	93.1	93.3	93.2	93.3
Specimen Average Thickness (mm)					61.7	61.8	61.7
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent					1/7/2020	1/7/2020	1/7/2020
To Whom					Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					3.868	3.651	3.974
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.175	1.106	1.207
HWT Rut Depth @ 5,000 passes (mm)	2.71		2.39				
HWT Rut Depth @ 10,000 passes (mm)	3.23		3.00				
HWT Rut Depth @ 20,000 passes (mm)	5.48		4.82				
HWT Creep Slope	8.13E-05		8.99E-05				
HWT Stripping Slope	0.0003798		0.0002319				
Stripping Inflection Point (SIP)	15435		13049				
Stripping Number (LC_{SN})	7032		7487				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.97E-06		1.64E-06				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	19001		22856				
Corrected $RD_{10,000}$	3.30		2.92				
Corrected $RD_{20,000}$	4.00		3.53				
Terminal Rut Depth (mm)	5.48		4.80				
Terminal Rut Depth (in)	0.22		0.19				
Terminal Wheel Passes (N_{max})	20002		20002				
Rutting Resistance Index (RRI)	15687		16222				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							

Ideal-CT - CT Index								

Pill Designation	SE76.2-2-8	SE76.2-2-9	SE76.2-2-10	SE76.2-2-11	SE76.2-2-12	SE76.2-4-1	SE76.2-4-2
Date Compacted	11/21/2019					11/21/2019	11/21/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	SE7	SE7	SE7	SE7	SE7	SE7	SE7
Mix ID	D1	D1	D1	D1	D1	D1	D1
Mix Type	D	D	D	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190101	2190101	2190101	2190101	2190101	2190101	2190101
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2444.1					2440.8	2442.6
Submerged Weight, g (B)	1396.6					1391.4	1396.9
SSD Weight, g (C)	2463.1					2458.8	2457
Bulk Specific Gravity, Gmb	2.292	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.287	2.304
% Water Absorbed by Volume	1.8	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.7	1.4
Theoretical Maximum Density, Gmm	2.471	2.471	2.471	2.471	2.471	2.471	2.471
% Voids in Total Mix (VTM)	**7.3**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**7.5**	**6.8**
% Compaction	92.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	92.5	93.2
Specimen Average Thickness (mm)	61.9						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/7/2020						
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	3.436						
Ideal-RT Shear Strength (MPa)	1.040	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						11632	10638
Ideal-CT Post-Peak Slope (S)						3.65	4.49
Ideal-CT G_f/S						3183	2370
Displacement (mm)						5.98	5.24

Ideal-CT - CT Index						127	83

Pill Designation	SE76.2-4-3	SE76.2-4-4	SE76.2-4-5	SE76.2-4-6
Date Compacted	11/21/2019	11/21/2019	11/21/2019	11/21/2019
Mix Number	1	1	1	1
TT Mix Code	SE7	SE7	SE7	SE7
Mix ID	D1	D1	D1	D1
Mix Type	D	D	D	D
Producer	Southeastern Materials	Southeastern Materials	Southeastern Materials	Southeastern Materials
TDOT JMF#	2190101	2190101	2190101	2190101
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22
Additive	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23	PaveGrip TS 23
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2441.8	2442.8		
Submerged Weight, g (B)	1395.5	1396.9		
SSD Weight, g (C)	2460.7	2460		
Bulk Specific Gravity, Gmb	2.292	2.298	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.8	1.6	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.471	2.471	2.471	2.471
% Voids in Total Mix (VTM)	**7.2**	**7.0**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.8	93.0	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent				
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	10703	11258		
Ideal-CT Post-Peak Slope (S)	4.25	3.73		
Ideal-CT G_f/S	2519	3017		
Displacement (mm)	6.26	5.55		

Ideal-CT - CT Index	105	112		

Pill Designation	RGD65.8-2-2	RGD65.8-2-1	RGD65.8-2-3	RGD65.8-2-4	RGD65.8-2-5	RGD65.8-2-6	RGD65.8-2-7
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190178	3190178	3190178	3190178	3190178	3190178	3190178
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2417.8	2421	2420.4	2418.3	2418.3	2422.1	2422.6
Submerged Weight, g (B)	1362.5	1358.5	1371.3	1365	1367.8	1366.2	1369.3
SSD Weight, g (C)	2426.2	2429.1	2441.9	2439.1	2433.7	2438.1	2440
Bulk Specific Gravity, Gmb	2.273	2.261	2.261	2.251	2.269	2.260	2.263
% Water Absorbed by Volume	0.8	0.8	2.0	1.9	1.4	1.5	1.6
Theoretical Maximum Density, Gmm	2.427	2.427	2.427	2.427	2.427	2.427	2.427
% Voids in Total Mix (VTM)	6.3	6.8	6.8	7.2	6.5	6.9	6.8
% Compaction	93.7	93.2	93.2	92.8	93.5	93.1	93.2
Specimen Average Thickness (mm)						61.7	61.7
Performance Test		HWT	HWT	HWT	HWT	Ideal RT	Ideal RT
Date Sent	12/12019	11/7/2019	11/7/2019	11/7/2019	11/7/2019	1/7/2020	1/7/2020
To Whom	LU	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia
Ideal-RT Load (KN)						2.203	2.085
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.669	0.633
HWT Rut Depth @ 5,000 passes (mm)		5.74		4.58			
HWT Rut Depth @ 10,000 passes (mm)		27.18		39.65			
HWT Rut Depth @ 20,000 passes (mm)		FAIL		FAIL			
HWT Creep Slope		0.0004597		0.0003505			
HWT Stripping Slope		0.006001		0.009004			
Stripping Inflection Point (SIP)		6475		6159			
Stripping Number (LC_{SN})		1820		1422			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)		1.17E-05		8.52E-06			
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})		6519		6031			
Corrected $RD_{10,000}$		6.54		4.19			
Corrected $RD_{20,000}$		8.24		5.15			
Terminal Rut Depth (mm)		15.40		14.47			
Terminal Rut Depth (in)		0.61		0.57			
Terminal Wheel Passes (N_{max})		8040		7432			
Rutting Resistance Index (RRI)		3165		3198			
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	RGD65.8-2-8	RGD65.8-2-9	RGD65.8-2-10	RGD65.8-2-11	RGD65.8-2-12	RGD65.8-4-1	RGD65.8-4-2
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190178	3190178	3190178	3190178	3190178	3190178	3190178
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2420.7	2423.5	2421.8	2407.1	2425.2	2417.8	2420.7
Submerged Weight, g (B)	1369.2	1370.1	1365.7	1353.5	1366.2	1363.3	1374.7
SSD Weight, g (C)	2438.9	2437.7	2439	2427	2438.4	2435.7	2445.2
Bulk Specific Gravity, Gmb	2.263	2.270	2.256	2.242	2.262	2.255	2.261
% Water Absorbed by Volume	1.7	1.3	1.6	1.9	1.2	1.7	2.3
Theoretical Maximum Density, Gmm	2.427	2.427	2.427	2.427	2.427	2.427	2.427
% Voids in Total Mix (VTM)	6.8	6.5	7.0	7.6	6.8	7.1	6.8
% Compaction	93.2	93.5	93.0	92.4	93.2	92.9	93.2
Specimen Average Thickness (mm)	61.9	61.8	61.8		61.9		
Performance Test	Ideal RT	Ideal RT	Ideal RT		Ideal RT	Ideal CT	Ideal CT
Date Sent	1/7/2020	1/7/2020	1/7/2020	12/1/2019	1/9/2020	12/19/2019	12/19/2019
To Whom	Cynthia	Cynthia	Cynthia	LU	Cynthia	Ingevity	Ingevity
Ideal-RT Load (KN)	1.974	3.531	1.754		2.001		
Ideal-RT Shear Strength (MPa)	0.598	1.071	0.532	#DIV/0!	0.606	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						9748	9263
Ideal-CT Post-Peak Slope (S)						1.71	1.69
Ideal-CT G_f/S						5711	5476
Displacement (mm)						6.84	6.72
Ideal-CT - CT Index						260	245

Pill Designation	RGD65.8-4-3	RGD65.8-4-4	RGD65.8-4-5	RGD65.8-4-6
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1
TT Mix Code	RGD6	RGD6	RGD6	RGD6
Mix ID	D2	D2	D2	D2
Mix Type	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190178	3190178	3190178	3190178
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2417.1	2415.9		
Submerged Weight, g (B)	1365.3	1371.8		
SSD Weight, g (C)	2441.3	2438.3		
Bulk Specific Gravity, Gmb	2.246	2.265	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	2.2	2.1	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.427	2.427	2.427	2.427
% Voids in Total Mix (VTM)	**7.4**	**6.7**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.6	93.3	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	12/19/2019	12/19/2019		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	9176	9290		
Ideal-CT Post-Peak Slope (S)	1.70	1.91		
Ideal-CT G_f/S	5389	4860		
Displacement (mm)	7.06	6.88		
Ideal-CT - CT Index	253	223		

Pill Designation	RGD66.3-2-1	RGD66.3-2-2	RGD66.3-2-3	RGD66.3-2-4	RGD66.3-2-5	RGD66.3-2-6	RGD66.3-2-7
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190178	3190178	3190178	3190178	3190178	3190178	3190178
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2386.2	2385.5	2389	2389.8	2388.3	2393.3	2393
Submerged Weight, g (B)	1335.8	1341	1346	1344.7	1346.4	1343.9	1344.1
SSD Weight, g (C)	2405.4	2406.7	2409.5	2410.9	2408.9	2412.3	2404.7
Bulk Specific Gravity, Gmb	2.231	2.238	2.246	2.241	2.248	2.240	2.256
% Water Absorbed by Volume	1.8	2.0	1.9	2.0	1.9	1.8	1.1
Theoretical Maximum Density, Gmm	2.409	2.409	2.409	2.409	2.409	2.409	2.409
% Voids in Total Mix (VTM)	**7.4**	**7.1**	**6.8**	**7.0**	**6.7**	**7.0**	**6.3**
% Compaction	92.6	92.9	93.2	93.0	93.3	93.0	93.7
Specimen Average Thickness (mm)					61.6	61.8	
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	
Date Sent	11/7/2019	11/7/2019	11/7/2019	11/7/2019	1/7/2020	1/7/2020	12/1/2019
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	LU
Ideal-RT Load (KN)					1.771	1.681	
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.538	0.510	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)	5.55		10.48				
HWT Rut Depth @ 10,000 passes (mm)	25.14		33.62				
HWT Rut Depth @ 20,000 passes (mm)	FAIL		FAIL				
HWT Creep Slope	0.0006222		0.001097				
HWT Stripping Slope	0.005634		0.004707				
Stripping Inflection Point (SIP)	6684		4397				
Stripping Number (LC_{SN})	1591		1319				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	9.55E-06		1.63E-05				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	7167		5280				
Corrected $RD_{10,000}$	4.98		7.37				
Corrected $RD_{20,000}$	6.18		9.23				
Terminal Rut Depth (mm)	16.96		20.02				
Terminal Rut Depth (in)	0.67		0.79				
Terminal Wheel Passes (N_{max})	8870		6732				
Rutting Resistance Index (RRI)	2947		1426				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	RGD66.3-2-8	RGD66.3-2-9	RGD66.3-2-10	RGD66.3-2-11	RGD66.3-2-12	RGD66.3-4-1	RGD66.3-4-2
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6	RGD6
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190178	3190178	3190178	3190178	3190178	3190178	3190178
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2389.8	2392.9	2389.3	2385.1	2406.6	2386.6	2387.4
Submerged Weight, g (B)	1341.2	1346.5	1341.8	1332.9	1355.7	1342.7	1343.1
SSD Weight, g (C)	2403.8	2407.8	2404.1	2402.1	2420.9	2410	2408.1
Bulk Specific Gravity, Gmb	2.249	2.255	2.249	2.231	2.259	2.236	2.242
% Water Absorbed by Volume	1.3	1.4	1.4	1.6	1.3	2.2	1.9
Theoretical Maximum Density, Gmm	2.409	2.409	2.409	2.409	2.409	2.409	2.409
% Voids in Total Mix (VTM)	6.6	6.4	6.6	7.4	6.2	7.2	6.9
% Compaction	93.4	93.6	93.4	92.6	93.8	92.8	93.1
Specimen Average Thickness (mm)	61.6		61.7	61.8	61.8		
Performance Test	Ideal RT		Ideal RT	Ideal RT	Ideal RT	Ideal CT	Ideal CT
Date Sent	1/7/2020	12/1/2019	1/7/2020	1/7/2020	1/7/2020	1/8/2020	1/8/2020
To Whom	Cynthia	LU	Cynthia	Cynthia	Cynthia	Ingevity	Ingevity
Ideal-RT Load (KN)	1.573		1.421	1.593	1.597		
Ideal-RT Shear Strength (MPa)	0.478	#DIV/0!	0.431	0.483	0.484	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						10091	9639
Ideal-CT Post-Peak Slope (S)						1.21	1.40
Ideal-CT G_f/S						8370	6863
Displacement (mm)						7.67	7.14
Ideal-CT - CT Index						427	326

Pill Designation	RGD66.3-4-3	RGD66.3-4-4	RGD66.3-4-5	RGD66.3-4-6
Date Compacted	10/2/2019	10/2/2019	10/2/2019	10/2/2019
Mix Number	1	1	1	1
TT Mix Code	RGD6	RGD6	RGD6	RGD6
Mix ID	D2	D2	D2	D2
Mix Type	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190178	3190178	3190178	3190178
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2386.9	2389.2		
Submerged Weight, g (B)	1338	1346.1		
SSD Weight, g (C)	2404.5	2408.9		
Bulk Specific Gravity, Gmb	2.238	2.248	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.7	1.9	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.409	2.409	2.409	2.409
% Voids in Total Mix (VTM)	**7.1**	**6.7**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.9	93.3	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	1/8/2020	1/8/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	10006	9064		
Ideal-CT Post-Peak Slope (S)	1.31	1.43		
Ideal-CT G_f/S	7661	6344		
Displacement (mm)	7.87	7.50		
Ideal-CT - CT Index	401	317		

Pill Designation	RGD75.8-2-1	RGD75.8-2-2	RGD75.8-2-3	RGD75.8-2-4	RGD75.8-2-5	RGD75.8-2-6	RGD75.8-2-7
Date Compacted	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190180	3190180	3190180	3190180	3190180	3190180	3190180
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2402	2415.6	2419.6	2423.1	2421.5	2419.3	2419.1
Submerged Weight, g (B)	1353.5	1362.9	1376.7	1371.7	1369.1	1369.8	1371.8
SSD Weight, g (C)	2415.8	2433.8	2445.6	2439.5	2438.7	2438.7	2438.2
Bulk Specific Gravity, Gmb	2.261	2.256	2.264	2.269	2.264	2.263	2.268
% Water Absorbed by Volume	1.3	1.7	2.4	1.5	1.6	1.8	1.8
Theoretical Maximum Density, Gmm	2.427	2.427	2.427	2.427	2.427	2.427	2.427
% Voids in Total Mix (VTM)	**6.8**	**7.1**	**6.7**	**6.5**	**6.7**	**6.7**	**6.5**
% Compaction	93.2	92.9	93.3	93.5	93.3	93.3	93.5
Specimen Average Thickness (mm)					61.8	61.9	61.8
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	11/14/2019	11/14/2019	11/14/2019	11/14/2019	1/7/2020	1/7/2020	1/7/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					5.248	5.836	6.17
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.592	1.768	1.870
HWT Rut Depth @ 5,000 passes (mm)	2.44		2.71				
HWT Rut Depth @ 10,000 passes (mm)	2.93		3.25				
HWT Rut Depth @ 20,000 passes (mm)	4.26		4.49				
HWT Creep Slope	7.80E-05		7.23E-05				
HWT Stripping Slope	0.0001596		7.23E-05				
Stripping Inflection Point (SIP)	12719		20996				
Stripping Number (LC_{SN})	>20002		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.04E-06		1.01E-06				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	-		-				
Corrected $RD_{10,000}$	3.09		3.38				
Corrected $RD_{20,000}$	3.90		4.17				
Terminal Rut Depth (mm)	4.26		4.49				
Terminal Rut Depth (in)	0.17		0.18				
Terminal Wheel Passes (N_{max})	20000		20000				
Rutting Resistance Index (RRI)	16646		16465				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	RGD75.8-2-8	RGD75.8-2-9	RGD75.8-2-10	RGD75.8-2-11	RGD75.8-2-12	RGD75.8-4-1	RGD75.8-4-2
Date Compacted	11/11/2019						
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190180	3190180	3190180	3190180	3190180	3190180	3190180
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2416.7					2418.5	2418.2
Submerged Weight, g (B)	1364.4					1376.3	1376.2
SSD Weight, g (C)	2434.3					2440.9	2439.2
Bulk Specific Gravity, Gmb	2.259	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.272	2.275
% Water Absorbed by Volume	1.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.1	2.0
Theoretical Maximum Density, Gmm	2.427	2.427	2.427	2.427	2.427	2.427	2.427
% Voids in Total Mix (VTM)	**6.9**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.4**	**6.3**
% Compaction	93.1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.6	93.7
Specimen Average Thickness (mm)	61.6						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/7/2020					11/14/2019	11/14/2019
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	5.445						
Ideal-RT Shear Strength (MPa)	1.655	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#VALUE!	#VALUE!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						10448	12585
Ideal-CT Post-Peak Slope (S)						3.06	2.18
Ideal-CT G_f/S						3416	5778
Displacement (mm)						6.15	7.48
Ideal-CT - CT Index						140	288

Pill Designation	RGD75.8-4-3	RGD75.8-4-4	RGD75.8-4-5	RGD75.8-4-6
Date Compacted				
Mix Number	1	1	1	1
TT Mix Code	RGD7	RGD7	RGD7	RGD7
Mix ID	D2	D2	D2	D2
Mix Type	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190180	3190180	3190180	3190180
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2418.1	2421.2		
Submerged Weight, g (B)	1373.1	1373.3		
SSD Weight, g (C)	2442.7	2441.6		
Bulk Specific Gravity, Gmb	2.261	2.266	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	2.3	1.9	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.427	2.427	2.427	2.427
% Voids in Total Mix (VTM)	**6.8**	**6.6**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.2	93.4	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	11/14/2019	11/14/2019		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#VALUE!	#VALUE!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	10785	11679		
Ideal-CT Post-Peak Slope (S)	2.47	2.18		
Ideal-CT G_f/S	4373	5351		
Displacement (mm)	6.27	6.52		
Ideal-CT - CT Index	183	232		

Pill Designation	RGD76.3-2-1	RGD76.3-2-2	RGD76.3-2-3	RGD76.3-2-4	RGD76.3-2-5	RGD76.3-2-6	RGD76.3-2-7
Date Compacted	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190180	3190180	3190180	3190180	3190180	3190180	3190180
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2389.7	2387.6	2381.3	2392.3	2385.1	2391.7	2388
Submerged Weight, g (B)	1341.2	1341.2	1342.7	1350.6	1360.8	1341.6	1348.7
SSD Weight, g (C)	2408.9	2408.5	2406.8	2412.8	2416.6	2406.1	2412.5
Bulk Specific Gravity, Gmb	2.238	2.237	2.238	2.252	2.259	2.247	2.245
% Water Absorbed by Volume	1.8	2.0	2.4	1.9	3.0	1.4	2.3
Theoretical Maximum Density, Gmm	2.409	2.409	2.409	2.409	2.409	2.409	2.409
% Voids in Total Mix (VTM)	7.1	7.1	7.1	6.5	6.2	6.7	6.8
% Compaction	92.9	92.9	92.9	93.5	93.8	93.3	93.2
Specimen Average Thickness (mm)					61.8	61.6	61.7
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	11/14/2019	11/14/2019	11/14/2019	11/14/2019	1/7/2020	1/7/2020	1/7/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					5.826	5.045	4.805
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.767	1.534	1.460
HWT Rut Depth @ 5,000 passes (mm)	2.67		3.14				
HWT Rut Depth @ 10,000 passes (mm)	3.31		3.74				
HWT Rut Depth @ 20,000 passes (mm)	7.07		5.04				
HWT Creep Slope	8.87E-05		8.16E-05				
HWT Stripping Slope	0.000843		0.0001548				
Stripping Inflection Point (SIP)	15891		13526				
Stripping Number (LC_{SN})	5415		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	2.24E-06		1.04E-06				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	19162		-				
Corrected $RD_{10,000}$	3.23		3.84				
Corrected $RD_{20,000}$	3.88		4.67				
Terminal Rut Depth (mm)	7.07		5.04				
Terminal Rut Depth (in)	0.28		0.20				
Terminal Wheel Passes (N_{max})	20000		20000				
Rutting Resistance Index (RRI)	14433		16031				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	RGD76.3-2-8	RGD76.3-2-9	RGD76.3-2-10	RGD76.3-2-11	RGD76.3-2-12	RGD76.3-4-1	RGD76.3-4-2
Date Compacted	11/11/2019						
Mix Number	1	1	1	1	1	1	1
TT Mix Code	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7	RGD7
Mix ID	D2	D2	D2	D2	D2	D2	D2
Mix Type	D	D	D	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190180	3190180	3190180	3190180	3190180	3190180	3190180
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2387.1					2387.8	2388.4
Submerged Weight, g (B)	1347.2					1356.1	1351.5
SSD Weight, g (C)	2410.3					2417.4	2417.7
Bulk Specific Gravity, Gmb	2.245	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.250	2.240
% Water Absorbed by Volume	2.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.8	2.7
Theoretical Maximum Density, Gmm	2.409	2.409	2.409	2.409	2.409	2.409	2.409
% Voids in Total Mix (VTM)	**6.8**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.6**	**7.0**
% Compaction	93.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.4	93.0
Specimen Average Thickness (mm)	61.7						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/7/2020					11/14/2019	11/14/2019
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	4.421						
Ideal-RT Shear Strength (MPa)	1.342	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						11819	11245
Ideal-CT Post-Peak Slope (S)						1.61	1.37
Ideal-CT G_f/S						7348	8223
Displacement (mm)						6.98	7.63
Ideal-CT - CT Index						342	418

Pill Designation	RGD76.3-4-3	RGD76.3-4-4	RGD76.3-4-5	RGD76.3-4-6
Date Compacted				
Mix Number	1	1	1	1
TT Mix Code	RGD7	RGD7	RGD7	RGD7
Mix ID	D2	D2	D2	D2
Mix Type	D	D	D	D
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	3190180	3190180	3190180	3190180
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2384.1	2388.4		
Submerged Weight, g (B)	1357.1	1355.8		
SSD Weight, g (C)	2418	2425.8		
Bulk Specific Gravity, Gmb	2.247	2.232	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	3.2	3.5	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.409	2.409	2.409	2.409
% Voids in Total Mix (VTM)	**6.7**	**7.3**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.3	92.7	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	11/14/2019	11/14/2019		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	11048	9899		
Ideal-CT Post-Peak Slope (S)	1.65	1.30		
Ideal-CT G_f/S	6695	7630		
Displacement (mm)	7.11	7.42		
Ideal-CT - CT Index	318	377		

Pill Designation	BA65.8-2-1	BA65.8-2-2	BA65.8-2-3	BA65.8-2-4	BA65.8-2-5	BA65.8-2-6	BA65.8-2-7
Date Compacted							
Mix Number	10	10	10	10	10	10	10
TT Mix Code	BA6	BA6	BA6	BA6	BA6	BA6	BA6
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2393.9	2388.5	2399.2	2394.5	2395.8	2393.1	2398.3
Submerged Weight, g (B)	1330.4	1326.8	1338	1341.5	1344.1	1344.8	1341
SSD Weight, g (C)	2420.9	2415	2421.2	2411.6	2415.2	2413.8	2416.5
Bulk Specific Gravity, Gmb	2.195	2.195	2.215	2.238	2.237	2.239	2.230
% Water Absorbed by Volume	2.5	2.4	2.0	1.6	1.8	1.9	1.7
Theoretical Maximum Density, Gmm	2.408	2.408	2.408	2.408	2.408	2.408	2.408
% Voids in Total Mix (VTM)	**8.8**	**8.8**	**8.0**	**7.1**	**7.1**	**7.0**	**7.4**
% Compaction	91.2	91.2	92.0	92.9	92.9	93.0	92.6
Specimen Average Thickness (mm)	62.5	62.3	62.3	62.1			
Performance Test	Ideal RT	Ideal RT	Ideal RT	Ideal RT	HWT	HWT	HWT
Date Sent	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Cynthia	Cynthia	Cynthia	Cynthia	Ingevity	Ingevity	Ingevity
Ideal-RT Load (KN)	1.419	1.492	2.089	2.393			
Ideal-RT Shear Strength (MPa)	0.425	0.448	0.628	0.722	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)					2.98		4.
HWT Rut Depth @ 10,000 passes (mm)					13.40		13
HWT Rut Depth @ 20,000 passes (mm)					FAIL		FA
HWT Creep Slope					3.41E-05		0.00(
HWT Stripping Slope					0.007743		0.0(
Stripping Inflection Point (SIP)					8489		83
Stripping Number (LC_{SN})					6600		16
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$					11.28		11
Corrected $RD_{20,000}$					13.98		13.
Terminal Rut Depth (mm)					20.00		20
Terminal Rut Depth (in)					0.79		0.
Terminal Wheel Passes (N_{max})					11014		11
Rutting Resistance Index (RRI)					2342		24
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	BA65.8-2-8	BA65.8-2-9	BA65.8-2-10	BA65.8-2-11	BA65.8-2-12	BA65.8-4-1	BA65.8-4-2
Date Compacted							
Mix Number	10	10	10	10	10	10	10
TT Mix Code	BA6	BA6	BA6	BA6	BA6	BA6	BA6
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2400					2399.1	2393
Submerged Weight, g (B)	1350.8					1346.3	1344.8
SSD Weight, g (C)	2417.1					2419.4	2412.3
Bulk Specific Gravity, Gmb	2.251	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.236	2.242
% Water Absorbed by Volume	1.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.9	1.8
Theoretical Maximum Density, Gmm	2.408	2.408	2.408	2.408	2.408	2.408	2.408
% Voids in Total Mix (VTM)	**6.5**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**7.2**	**6.9**
% Compaction	93.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	92.8	93.1
Specimen Average Thickness (mm)							
Performance Test	HWT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/8/2020	1/8/2020
To Whom	Ingevity					Ingevity	Ingevity
Ideal-RT Load (KN)							
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)	11						
HWT Rut Depth @ 10,000 passes (mm)	27						
HWT Rut Depth @ 20,000 passes (mm)	IL						
HWT Creep Slope	3317						
HWT Stripping Slope	493						
Stripping Inflection Point (SIP)	27						
Stripping Number (LC_{SN})	82						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$	28						
Corrected $RD_{20,000}$	98						
Terminal Rut Depth (mm)	01						
Terminal Rut Depth (in)	79						
Terminal Wheel Passes (N_{max})	14						
Rutting Resistance Index (RRI)	43						
Ideal-CT Fracture Energy (G_f)						5999	6546
Ideal-CT Post-Peak Slope (S)						3.50	3.22
Ideal-CT G_f/S						1713	2030
Displacement (mm)						4.67	4.79
Ideal-CT - CT Index						53	65

Pill Designation	BA65.8-4-3	BA65.8-4-4	BA65.8-4-5	BA65.8-4-6
Date Compacted				
Mix Number	10	10	10	10
TT Mix Code	BA6	BA6	BA6	BA6
Mix ID	D3	D3	D3	D3
Mix Type	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2401.8	2400.7		
Submerged Weight, g (B)	1346.9	1344.6		
SSD Weight, g (C)	2419	2420		
Bulk Specific Gravity, Gmb	2.240	2.232	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.6	1.8	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.408	2.408	2.408	2.408
% Voids in Total Mix (VTM)	**7.0**	**7.3**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.0	92.7	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	1/8/2020	1/8/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	7145	6917		
Ideal-CT Post-Peak Slope (S)	2.80	2.71		
Ideal-CT G_f/S	2551	2551		
Displacement (mm)	5.32	5.26		
Ideal-CT - CT Index	90	89		

Pill Designation	BA66.3-2-1	BA66.3-2-2	BA66.3-2-3	BA66.3-2-4	BA66.3-2-5	BA66.3-2-6	BA66.3-2-7
Date Compacted							
Mix Number	9	9	9	9	9	9	9
TT Mix Code	BA6	BA6	BA6	BA6	BA6	BA6	BA6
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2374.8	2379.8	2381.3	2379	2378.2	2378.9	2376.7
Submerged Weight, g (B)	1324.2	1331.8	1327.6	1329.3	1327.4	1332.2	1324.3
SSD Weight, g (C)	2401.2	2399.1	2399.9	2395.4	2395.5	2397.9	2394.5
Bulk Specific Gravity, Gmb	2.205	2.230	2.221	2.231	2.227	2.232	2.221
% Water Absorbed by Volume	2.5	1.8	1.7	1.5	1.6	1.8	1.7
Theoretical Maximum Density, Gmm	2.390	2.390	2.390	2.390	2.390	2.390	2.390
% Voids in Total Mix (VTM)	**7.7**	**6.7**	**7.1**	**6.6**	**6.8**	**6.6**	**7.1**
% Compaction	92.3	93.3	92.9	93.4	93.2	93.4	92.9
Specimen Average Thickness (mm)					61.9	61.9	61.9
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					1.692	1.729	1.698
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.512	0.524	0.514
HWT Rut Depth @ 5,000 passes (mm)	5.74		15.73				
HWT Rut Depth @ 10,000 passes (mm)	42.96		43.76				
HWT Rut Depth @ 20,000 passes (mm)	FAIL		FAIL				
HWT Creep Slope	0.0005151		0.0005426				
HWT Stripping Slope	0.01378		0.005605				
Stripping Inflection Point (SIP)	4079		6699				
Stripping Number (LC_{SN})	1820		989				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.17E-05		1.70E-05				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	6519		4263				
Corrected $RD_{10,000}$	6.54		6.25				
Corrected $RD_{20,000}$	8.25		7.94				
Terminal Rut Depth (mm)	15.40		19.27				
Terminal Rut Depth (in)	0.61		0.76				
Terminal Wheel Passes (N_{max})	8040		5500				
Rutting Resistance Index (RRI)	3165		1327				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	BA66.3-2-8	BA66.3-2-9	BA66.3-2-10	BA66.3-2-11	BA66.3-2-12	BA66.3-4-1	BA66.3-4-2
Date Compacted							
Mix Number	9	9	9	9	9	9	9
TT Mix Code	BA6	BA6	BA6	BA6	BA6	BA6	BA6
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2379.4					2376.9	2379.1
Submerged Weight, g (B)	1328.2					1326.9	1331.4
SSD Weight, g (C)	2396.8					2390.7	2398.1
Bulk Specific Gravity, Gmb	2.227	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.234	2.230
% Water Absorbed by Volume	1.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.3	1.8
Theoretical Maximum Density, Gmm	2.390	2.390	2.390	2.390	2.390	2.390	2.390
% Voids in Total Mix (VTM)	**6.8**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.5**	**6.7**
% Compaction	93.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.5	93.3
Specimen Average Thickness (mm)	62.1						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/8/2020	1/8/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	1.535						
Ideal-RT Shear Strength (MPa)	0.463	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						6983	7738
Ideal-CT Post-Peak Slope (S)						2.66	2.07
Ideal-CT G_f/S						2625	3732
Displacement (mm)						5.55	6.09
Ideal-CT - CT Index						97	152

Pill Designation	BA66.3-4-3	BA66.3-4-4	BA66.3-4-5	BA66.3-4-6
Date Compacted				
Mix Number	9	9	9	9
TT Mix Code	BA6	BA6	BA6	BA6
Mix ID	D3	D3	D3	D3
Mix Type	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2381.5	2380.2		
Submerged Weight, g (B)	1334	1332.6		
SSD Weight, g (C)	2398.5	2400		
Bulk Specific Gravity, Gmb	2.237	2.230	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.6	1.9	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.390	2.390	2.390	2.390
% Voids in Total Mix (VTM)	**6.4**	**6.7**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.6	93.3	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	1/8/2020	1/8/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	6376	7085		
Ideal-CT Post-Peak Slope (S)	2.88	2.12		
Ideal-CT G_f/S	2216	3345		
Displacement (mm)	5.21	5.68		
Ideal-CT - CT Index	77	127		

Pill Designation	BA75.8-2-1	BA75.8-2-2	BA75.8-2-3	BA75.8-2-4	BA75.8-2-5	BA75.8-2-7	BA75.8-2-6
Date Compacted							
Mix Number	11	11	11	11	11	11	11
TT Mix Code	BA7	BA7	BA7	BA7	BA7	BA7	BA7
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2398.5	2396.9	2397.2	2396.9	2397.9	2400.3	2400.7
Submerged Weight, g (B)	1338	1340.7	1345.8	1349.5	1344.8	1349	1347
SSD Weight, g (C)	2415.6	2411.4	2415.1	2414.3	2417.6	2421.9	2414.8
Bulk Specific Gravity, Gmb	2.226	2.239	2.242	2.251	2.235	2.237	2.248
% Water Absorbed by Volume	1.7	1.5	1.8	1.8	2.0	2.2	1.5
Theoretical Maximum Density, Gmm	2.408	2.408	2.408	2.408	2.408	2.408	2.408
% Voids in Total Mix (VTM)	**8.3**	**7.7**	**7.6**	**7.2**	**7.9**	**7.8**	**7.3**
% Compaction	101.7	102.3	102.4	102.8	102.1	102.2	102.7
Specimen Average Thickness (mm)	62.3	61.9			62.0	62.1	
Performance Test	Ideal RT	Ideal RT	HWT	HWT	Ideal RT	Ideal RT	HWT
Date Sent	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Cynthia	Cynthia	Ingevity	Ingevity	Cynthia	Cynthia	Ingevity
Ideal-RT Load (KN)	4.531	5.000			4.858	5.234	
Ideal-RT Shear Strength (MPa)	1.363	1.513	#DIV/0!	#DIV/0!	1.468	1.579	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)			2.67				2.
HWT Rut Depth @ 10,000 passes (mm)			4.57				2.
HWT Rut Depth @ 20,000 passes (mm)			32.89				4.
HWT Creep Slope			0.000165				8.28
HWT Stripping Slope			0.003642				0.00
Stripping Inflection Point (SIP)			11961				16
Stripping Number (LC_{SN})			9200				>20
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$			11.28				11
Corrected $RD_{20,000}$			13.98				13
Terminal Rut Depth (mm)			17.39				4.
Terminal Rut Depth (in)			0.68				0.
Terminal Wheel Passes (N_{max})			15810				20
Rutting Resistance Index (RRI)			4986				16
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	BA75.8-2-8	BA75.8-2-9	BA75.8-2-11	BA75.8-2-11	BA75.8-2-12	BA75.8-4-1	BA75.8-4-2
Date Compacted							
Mix Number	11	11	11	11	11	11	11
TT Mix Code	BA7	BA7	BA7	BA7	BA7	BA7	BA7
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2401.8					2398.3	2398.8
Submerged Weight, g (B)	1350.2					1337.7	1342.1
SSD Weight, g (C)	2418.8					2420.5	2420.1
Bulk Specific Gravity, Gmb	2.248	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.215	2.225
% Water Absorbed by Volume	1.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.3	2.2
Theoretical Maximum Density, Gmm	2.408	2.408	2.408	2.408	2.408	2.408	2.408
% Voids in Total Mix (VTM)	**7.3**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**8.8**	**8.3**
% Compaction	102.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	101.2	101.7
Specimen Average Thickness (mm)							
Performance Test	HWT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/8/2020	1/8/2020
To Whom	Ingevity					Ingevity	Ingevity
Ideal-RT Load (KN)							
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)	22						
HWT Rut Depth @ 10,000 passes (mm)	75						
HWT Rut Depth @ 20,000 passes (mm)	36						
HWT Creep Slope	E-05						
HWT Stripping Slope	3276						
Stripping Inflection Point (SIP)	73						
Stripping Number (LC_{SN})	002						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$	28						
Corrected $RD_{20,000}$	98						
Terminal Rut Depth (mm)	38						
Terminal Rut Depth (in)	17						
Terminal Wheel Passes (N_{max})	02						
Rutting Resistance Index (RRI)	53						
Ideal-CT Fracture Energy (G_f)						8516	8052
Ideal-CT Post-Peak Slope (S)						2.53	2.93
Ideal-CT G_f/S						3368	2750
Displacement (mm)						5.93	5.46
Ideal-CT - CT Index						132	99

Pill Designation	BA75.8-4-3	BA75.8-4-4	BA75.8-4-5	BA75.8-4-6
Date Compacted				
Mix Number	11	11	11	11
TT Mix Code	BA7	BA7	BA7	BA7
Mix ID	D3	D3	D3	D3
Mix Type	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1190325	1190325	1190325	1190325
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	5.8	5.8	5.8	5.8
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2398.5	2399.6		
Submerged Weight, g (B)	1345.8	1349.1		
SSD Weight, g (C)	2417.4	2419.3		
Bulk Specific Gravity, Gmb	2.238	2.242	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.9	2.0	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.408	2.408	2.408	2.408
% Voids in Total Mix (VTM)	**7.8**	**7.6**	**#DIV/0!**	**#DIV/0!**
% Compaction	102.2	102.4	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	1/8/2020	1/8/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	8690	8941		
Ideal-CT Post-Peak Slope (S)	3.55	3.44		
Ideal-CT G_f/S	2447	2596		
Displacement (mm)	5.37	5.44		
Ideal-CT - CT Index	88	94		

Pill Designation	BA76.3-2-1	BA76.3-2-2	BA76.3-2-3	BA76.3-2-4	BA76.3-2-5	BA76.3-2-6	BA76.3-2-7
Date Compacted							
Mix Number	12	12	12	12	12	12	12
TT Mix Code	BA7	BA7	BA7	BA7	BA7	BA7	BA7
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1290325	1290325	1290325	1290325	1290325	1290325	1290325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2396.5	2380.4	2398.9	2377.1	2380.4	2380.2	2378.7
Submerged Weight, g (B)	1331.6	1336.1	1331.7	1334.2	1333.5	1331.2	1327.8
SSD Weight, g (C)	2401	2400.7	2400.3	2396.8	2400.2	2396.8	2397.8
Bulk Specific Gravity, Gmb	2.241	2.236	2.245	2.237	2.232	2.234	2.223
% Water Absorbed by Volume	0.5	2.3	0.2	2.2	2.2	1.9	2.1
Theoretical Maximum Density, Gmm	2.390	2.390	2.390	2.390	2.390	2.390	2.390
% Voids in Total Mix (VTM)	**7.5**	**7.7**	**7.3**	**7.7**	**8.0**	**7.8**	**8.4**
% Compaction	92.5	92.3	92.7	92.3	92.0	92.2	91.6
Specimen Average Thickness (mm)					62.0	61.7	62.0
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					4.08	3.521	4.219
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.234	1.069	1.276
HWT Rut Depth @ 5,000 passes (mm)	2.71		3.09				
HWT Rut Depth @ 10,000 passes (mm)	3.89		5.69				
HWT Rut Depth @ 20,000 passes (mm)	31.51		42.11				
HWT Creep Slope	6.87E-05		0.0002078				
HWT Stripping Slope	0.004166		0.004432				
Stripping Inflection Point (SIP)	13030		11193				
Stripping Number (LC_{SN})	2618		2343				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$	11.28		11.28				
Corrected $RD_{20,000}$	13.98		13.98				
Terminal Rut Depth (mm)	20.01		20.00				
Terminal Rut Depth (in)	0.79		0.79				
Terminal Wheel Passes (N_{max})	17240		15022				
Rutting Resistance Index (RRI)	3658		3194				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	BA76.3-2-8	BA76.3-2-9	BA76.3-2-12	BA76.3-2-12	BA76.3-2-12	BA76.3-4-1	BA76.3-4-2
Date Compacted							
Mix Number	12	12	12	12	12	12	12
TT Mix Code	BA7	BA7	BA7	BA7	BA7	BA7	BA7
Mix ID	D3	D3	D3	D3	D3	D3	D3
Mix Type	D	D	D	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1290325	1290325	1290325	1290325	1290325	1290325	1290325
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2380.2					2379.6	2381.1
Submerged Weight, g (B)	1334.6					1330.5	1335
SSD Weight, g (C)	2398.6					2398	2400.3
Bulk Specific Gravity, Gmb	2.237	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.229	2.235
% Water Absorbed by Volume	2.1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.1	2.2
Theoretical Maximum Density, Gmm	2.390	2.390	2.390	2.390	2.390	2.390	2.390
% Voids in Total Mix (VTM)	**7.7**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**8.1**	**7.8**
% Compaction	92.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	91.9	92.2
Specimen Average Thickness (mm)	61.8						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/8/2020	1/8/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	3.904						
Ideal-RT Shear Strength (MPa)	1.184	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						9076	9579
Ideal-CT Post-Peak Slope (S)						2.67	3.05
Ideal-CT G_f/S						3393	3145

Displacement (mm)						6.14	6.16
Ideal-CT - CT Index						139	129

Pill Designation	BA76.3-4-3	BA76.3-4-4	BA76.3-4-5	BA76.3-4-6
Date Compacted				
Mix Number	12	12	12	12
TT Mix Code	BA7	BA7	BA7	BA7
Mix ID	D3	D3	D3	D3
Mix Type	D	D	D	D
Producer	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt	Blalock Asphalt
TDOT JMF#	1290325	1290325	1290325	1290325
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6.3	6.3	6.3	6.3
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2378.5	2382.9		
Submerged Weight, g (B)	1327.1	1332.8		
SSD Weight, g (C)	2395.6	2400.5		
Bulk Specific Gravity, Gmb	2.226	2.232	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.9	2.0	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.390	2.390	2.390	2.390
% Voids in Total Mix (VTM)	**8.2**	**7.9**	**#DIV/0!**	**#DIV/0!**
% Compaction	91.8	92.1	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	1/8/2020	1/8/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	9250	9111		
Ideal-CT Post-Peak Slope (S)	2.57	3.19		
Ideal-CT G_f/S	3601	2854		

Displacement (mm)	6.66	5.86		
Ideal-CT - CT Index	160	112		

Pill Designation	DC66.0-2-1	DC66.0-2-2	DC66.0-2-3	DC66.0-2-4	DC66.0-2-5	DC66.0-2-6	DC66.0-2-7
Date Compacted							
Mix Number	13	13	13	13	13	13	13
TT Mix Code	DC6	DC6	DC6	DC6	DC6	DC6	DC6
Mix ID	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6	6	6	6	6	6	6
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2312.1	2314	2312.5	2313.2	2312.8	2314.5	2301.8
Submerged Weight, g (B)	1245.3	1249.2	1254.9	1254.3	1255.2	1254.7	1240.3
SSD Weight, g (C)	2324.5	2325.4	2326.7	2330.9	2327.7	2331	2313.6
Bulk Specific Gravity, Gmb	2.142	2.150	2.158	2.149	2.156	2.150	2.145
% Water Absorbed by Volume	1.5	1.4	1.7	2.1	1.8	2.0	1.4
Theoretical Maximum Density, Gmm	2.315	2.315	2.315	2.315	2.315	2.315	2.315
% Voids in Total Mix (VTM)	**7.5**	**7.1**	**6.8**	**7.2**	**6.8**	**7.1**	**7.4**
% Compaction	92.5	92.9	93.2	92.8	93.2	92.9	92.6
Specimen Average Thickness (mm)					62.0	62.0	62.0
Performance Test	HWT	HWT	HWT	HWT	Ideal-RT	Ideal-RT	Ideal-RT
Date Sent	2/12/2020	2/12/2020	2/12/2020	2/12/2020			
To Whom	Ingevity	Ingevity	Ingevity	Ingevity			
Ideal-RT Load (KN)					4.298	3.831	3.411
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.299	1.158	1.031
HWT Rut Depth @ 5,000 passes (mm)	2.50		3.20				
HWT Rut Depth @ 10,000 passes (mm)	4.10		4.31				
HWT Rut Depth @ 20,000 passes (mm)	19.89		28.13				
HWT Creep Slope	6.865E-07		8.996E-05				
HWT Stripping Slope	0.001718		0.00422				
Stripping Inflection Point (SIP)	9569		13676				
Stripping Number (LC_{SN})	1255		2856				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	8.22E-06		4.51E-06				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	16869		14196				
Corrected $RD_{10,000}$	3.57		3.93				
Corrected $RD_{20,000}$	4.49		4.73				
Terminal Rut Depth (mm)	19.93		20.01				
Terminal Rut Depth (in)	0.78		0.79				
Terminal Wheel Passes (N_{max})	20002		18244				
Rutting Resistance Index (RRI)	4308		3871				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	DC66.0-2-8	DC66.0-2-15	DC66.0-2-16	DC66.0-2-17	DC66.0-2-18	DC66.0-4-1	DC66.0-4-2
Date Compacted							
Mix Number	13	13	13	13	13	13	13
TT Mix Code	DC6	DC6	DC6	DC6	DC6	DC6	DC6
Mix ID	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6	6	6	6	6	6	6
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2298					2315	2312.3
Submerged Weight, g (B)	1229.6					1260	1261.5
SSD Weight, g (C)	2321					2332.6	2330.1
Bulk Specific Gravity, Gmb	2.106	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.158	2.164
% Water Absorbed by Volume	2.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.1	2.2
Theoretical Maximum Density, Gmm	2.315			2.315	2.315	2.315	2.315
% Voids in Total Mix (VTM)	**9.0**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.8**	**6.5**
% Compaction	91.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.2	93.5
Specimen Average Thickness (mm)		62.0					
Performance Test		Ideal-RT				Ideal CT	Ideal CT
Date Sent						2/12/2020	2/12/2020
To Whom						Ingevity	Ingevity
Ideal-RT Load (KN)		3.873					
Ideal-RT Shear Strength (MPa)	#DIV/0!	1.170	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						8131	8545
Ideal-CT Post-Peak Slope (S)						5.26	6.27

Ideal-CT G_f/S						1545	1362
Displacement (mm)						3.87	4.45
Ideal-CT - CT Index						40	40

Pill Designation	DC66.0-4-3	DC66.0-4-4	DC66.0-4-5	DC66.0-4-6
Date Compacted				
Mix Number	13	13	13	13
TT Mix Code	DC6	DC6	DC6	DC6
Mix ID	D4	D4	D4	D4
Mix Type	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22
Additive	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6	6	6	6
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2316.2	2314.2		
Submerged Weight, g (B)	1258.8	1255.1		
SSD Weight, g (C)	2336	2332.2		
Bulk Specific Gravity, Gmb	2.150	2.149	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	2.4	2.2	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.315	2.315	2.315	
% Voids in Total Mix (VTM)	**7.1**	**7.2**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.9	92.8	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	2/12/2020	2/12/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	8451	8571		
Ideal-CT Post-Peak Slope (S)	5.05	5.38		

Ideal-CT G_f/S	1675	1594		
Displacement (mm)	4.15	4.32		
Ideal-CT - CT Index	46	46		

Pill Designation	DC66.5-2-1	DC66.5-2-2	DC66.5-2-3	DC66.5-2-4	DC66.5-2-5	DC66.5-2-6	DC66.5-2-7	DC66.5-2-8	DC66.5-2-9	DC66.5-2-10
Date Compacted										
Mix Number	16	16	16	16	16	16	16	16	16	16
TT Mix Code	DC6	DC6	DC6	DC6	DC6	DC6	DC6	DC6	DC6	DC6
Mix ID	D4	D4	D4	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Age Time	2	2	2	2	2	2	2	2	2	2
Dry Weight in Air, g (A)							2283.4	2289.1	2292.2	2290.5
Submerged Weight, g (B)							1229.5	1230.8	1227.1	1222.1
SSD Weight, g (C)							2296.9	2302.8	2299.9	2297.8
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.139	2.135	2.137	2.129
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.8	1.8	1.0	1.0
Theoretical Maximum Density, Gmm	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300
% Voids in Total Mix (VTM)	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**7.0**	**7.2**	**7.1**	**7.4**
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.0	92.8	92.9	92.6
Specimen Average Thickness (mm)								62.0		
Performance Test								Ideal-RT		
Date Sent										
To Whom										
Ideal-RT Load (KN)								2.970		
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.898	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)									3.53	
HWT Rut Depth @ 10,000 passes (mm)									5.26	
HWT Rut Depth @ 20,000 passes (mm)									42.40	
HWT Creep Slope									5.75E-05	
HWT Stripping Slope									0.004162	
Stripping Inflection Point (SIP)									10898	
Stripping Number (LC_{SN})									2576	
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									6.02E-06	
Stripping Strain (ε^{vt})										
Stripping Life (LC_{ST})									11535	
Corrected $RD_{10,000}$									4.41	
Corrected $RD_{20,000}$									5.48	
Terminal Rut Depth (mm)									20.00	
Terminal Rut Depth (in)									0.79	
Terminal Wheel Passes (N_{max})									14784	
Rutting Resistance Index (RRI)									3143	
Ideal-CT Fracture Energy (G_f)										
Ideal-CT Post-Peak Slope (S)										
Ideal-CT G_f/S										
Displacement (mm)										
Ideal-CT - CT Index										

Pill Designation	DC66.5-2-11	DC66.5-2-12	DC66.5-2-13	DC66.5-2-14
Date Compacted				
Mix Number	16	16	16	16
TT Mix Code	DC6	DC6	DC6	DC6
Mix ID	D4	D4	D4	D4
Mix Type	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22
Additive	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6.5	6.5	6.5	6.5
Age Time	2	2	2	2
Dry Weight in Air, g (A)	2292.2	2292.1	2296.4	2292.8
Submerged Weight, g (B)	1227.1	1229.5	1231.9	1230.8
SSD Weight, g (C)	2302.2	2301.9	2304.4	2301.7
Bulk Specific Gravity, Gmb	2.132	2.137	2.141	2.141
% Water Absorbed by Volume	1.3	1.3	1.0	1.2
Theoretical Maximum Density, Gmm	2.300	2.300	2.300	2.300
% Voids in Total Mix (VTM)	**7.3**	**7.1**	**6.9**	**6.9**
% Compaction	92.7	92.9	93.1	93.1
Specimen Average Thickness (mm)			62.0	62.0
Performance Test			Ideal-RT	Ideal-RT
Date Sent				
To Whom				
Ideal-RT Load (KN)			2.791	3.196
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	0.843	0.966
HWT Rut Depth @ 5,000 passes (mm)	3.39			
HWT Rut Depth @ 10,000 passes (mm)	4.66			
HWT Rut Depth @ 20,000 passes (mm)	40.85			
HWT Creep Slope	9.03E-05			
HWT Stripping Slope	0.004647			
Stripping Inflection Point (SIP)	12526			
Stripping Number (LC_{SN})	3141			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	4.80E-06			
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})	11945			
Corrected $RD_{10,000}$	4.19			
Corrected $RD_{20,000}$	5.15			
Terminal Rut Depth (mm)	20.24			
Terminal Rut Depth (in)	0.80			
Terminal Wheel Passes (N_{max})	15592			
Rutting Resistance Index (RRI)	3168			
Ideal-CT Fracture Energy (G_f)				
Ideal-CT Post-Peak Slope (S)				
Ideal-CT G_f/S				
Displacement (mm)				
Ideal-CT - CT Index				

Pill Designation	DC66.5-2-15	DC66.5-2-16	DC66.5-2-17	DC66.5-2-18	DC66.5-4-1	DC66.5-4-2	DC66.5-4-3	DC66.5-4-4	DC66.5-4-5	DC66.5-4-6
Date Compacted										
Mix Number	16	16	16	16	16	16	16	16	16	16
TT Mix Code	DC6	DC6	DC6	DC6	DC6	DC6	DC6	DC6	DC6	DC6
Mix ID	D4	D4	D4	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Age Time	2	2	2	2	4	4	4	4	4	4
Dry Weight in Air, g (A)	2291.8	2291.5	2293.1	2294.7	2293	2293.3	2291.7	2294.7		
Submerged Weight, g (B)	1223.9	1231.9	1228.5	1226.3	1240.2	1241.4	1240.5	1239		
SSD Weight, g (C)	2300.6	2304	2303.3	2307.1	2304.5	2309.1	2303.9	2308.7		
Bulk Specific Gravity, Gmb	2.129	2.137	2.134	2.123	2.154	2.148	2.155	2.145	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.1	1.6	1.3	1.6	1.5	2.1	1.6	1.8	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300
% Voids in Total Mix (VTM)	**7.5**	**7.1**	**7.2**	**7.7**	**6.3**	**6.6**	**6.3**	**6.7**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.5	92.9	92.8	92.3	93.7	93.4	93.7	93.3	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)	62.0	62.0	62.0	62.0						
Performance Test	Ideal-RT	Ideal-RT	Ideal-RT	Ideal-RT	Ideal CT	Ideal CT	Ideal CT	Ideal CT		
Date Sent					2/13/2020	2/13/2020	2/13/2020	2/13/2020		
To Whom					Ingevity	Ingevity	Ingevity	Ingevity		
Ideal-RT Load (KN)	3.873	4.291	4.184	3.823						
Ideal-RT Shear Strength (MPa)	2.000	1.297	1.264	1.155	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)										
HWT Rut Depth @ 10,000 passes (mm)										
HWT Rut Depth @ 20,000 passes (mm)										
HWT Creep Slope										
HWT Stripping Slope										
Stripping Inflection Point (SIP)										
Stripping Number (LC_{SN})										
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)										
Stripping Strain (ε^{vt})										
Stripping Life (LC_{ST})										
Corrected $RD_{10,000}$										
Corrected $RD_{20,000}$										
Terminal Rut Depth (mm)										
Terminal Rut Depth (in)										
Terminal Wheel Passes (N_{max})										
Rutting Resistance Index (RRI)										
Ideal-CT Fracture Energy (G_f)					8774	9053	8515	9328		
Ideal-CT Post-Peak Slope (S)					4.52	3.84	5.09	4.11		
Ideal-CT G_f/S					1939	2360	1673	2272		
Displacement (mm)					4.94	5.29	4.66	5.20		
Ideal-CT - CT Index					64	83	52	79		

Pill Designation	DC76.0-2-1	DC76.0-2-2	DC76.0-2-3	DC76.0-2-4	DC76.0-2-5	DC76.0-2-6	DC76.0-2-7
Date Compacted							
Mix Number	15	15	15	15	15	15	15
TT Mix Code	DC7	DC7	DC7	DC7	DC7	DC7	DC7
Mix ID	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6	6	6	6	6	6	6
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2314.8	2309.7	2313.7	2317	2313.4	2315.6	2316.7
Submerged Weight, g (B)	1248.5	1239.6	1252.3	1251	1253.7	1259.5	1253.6
SSD Weight, g (C)	2325.1	2319.6	2325	2325.3	2325.7	2325.8	2327
Bulk Specific Gravity, Gmb	2.150	2.139	2.157	2.157	2.158	2.172	2.158
% Water Absorbed by Volume	1.2	1.2	1.4	1.0	1.5	1.2	1.2
Theoretical Maximum Density, Gmm	2.315	2.315	2.315	2.315	2.315	2.315	2.315
% Voids in Total Mix (VTM)	**7.1**	**7.6**	**6.8**	**6.8**	**6.8**	**6.2**	**6.8**
% Compaction	92.9	92.4	93.2	93.2	93.2	93.8	93.2
Specimen Average Thickness (mm)					62.0	62.0	62.0
Performance Test	HWT	HWT	HWT	HWT	Ideal-RT	Ideal-RT	Ideal-RT
Date Sent	2/25/2020	2/25/2020	2/25/2020	2/25/2020			
To Whom	Ingevity	Ingevity	Ingevity	Ingevity			
Ideal-RT Load (KN)					7.487	8.125	7.272
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.263	2.455	2.198
HWT Rut Depth @ 5,000 passes (mm)	2.23		1.51				
HWT Rut Depth @ 10,000 passes (mm)	2.83		1.85				
HWT Rut Depth @ 20,000 passes (mm)	5.81		2.55				
HWT Creep Slope	0.000102		5.035E-05				
HWT Stripping Slope	0.0007824		9.445E-05				
Stripping Inflection Point (SIP)	17154		14085				
Stripping Number (LC_{SN})	6163		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.43E-06		7.26E-07				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	20911		-				
Corrected $RD_{10,000}$	2.62		1.88				
Corrected $RD_{20,000}$	3.06		2.44				
Terminal Rut Depth (mm)	5.81		2.55				
Terminal Rut Depth (in)	0.23		0.10				
Terminal Wheel Passes (N_{max})	20002		20002				
Rutting Resistance Index (RRI)	15427		17994				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							

Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	DC76.0-2-8	DC76.0-2-9	DC76.0-2-13	DC76.0-2-13	DC76.0-2-13	DC76.0-4-1	DC76.0-4-2
Date Compacted							
Mix Number	15	15	15	15	15	15	15
TT Mix Code	DC7	DC7	DC7	DC7	DC7	DC7	DC7
Mix ID	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6	6	6	6	6	6	6
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2317.5					2317.1	2315.8
Submerged Weight, g (B)	1261.6					1259.6	1253.8
SSD Weight, g (C)	232.4					2328.3	2328
Bulk Specific Gravity, Gmb	-2.252	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.168	2.156
% Water Absorbed by Volume	263.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.4	1.5
Theoretical Maximum Density, Gmm	2.315	2.315	2.315	2.315	2.315	2.315	2.315
% Voids in Total Mix (VTM)	**197.3**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.3**	**6.9**
% Compaction	-97.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.7	93.1
Specimen Average Thickness (mm)	62.0						
Performance Test	Ideal-RT					Ideal-CT	Ideal-CT
Date Sent						2/25/2020	2/25/2020
To Whom						Ingevity	Ingevity
Ideal-RT Load (KN)	8.433						
Ideal-RT Shear Strength (MPa)	2.549	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						9431	9088
Ideal-CT Post-Peak Slope (S)						9.40	6.87
Ideal-CT G_f/S						1009	1322

Displacement (mm)						3.98	3.90
Ideal-CT - CT Index						27	34

Pill Designation	DC76.0-4-3	DC76.0-4-4	DC76.0-4-5	DC76.0-4-6
Date Compacted				
Mix Number	15	15	15	15
TT Mix Code	DC7	DC7	DC7	DC7
Mix ID	D4	D4	D4	D4
Mix Type	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22
Additive	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6	6	6	6
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2316.2	2314.6		
Submerged Weight, g (B)	1256.1	1259.1		
SSD Weight, g (C)	2327	2325.7		
Bulk Specific Gravity, Gmb	2.163	2.170	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.3	1.4	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.315	2.315	2.315	2.315
% Voids in Total Mix (VTM)	**6.6**	**6.3**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.4	93.7	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal-CT	Ideal-CT		
Date Sent	2/25/2020	2/25/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	8818	9116		
Ideal-CT Post-Peak Slope (S)	8.83	10.12		
Ideal-CT G_f/S	999	901		

Displacement (mm)	3.67	3.77		
Ideal-CT - CT Index	24	23		

Pill Designation	DC76.5-2-1	DC76.5-2-2	DC76.5-2-3	DC76.5-2-4	DC76.5-2-5	DC76.5-2-6	DC76.5-2-7
Date Compacted							
Mix Number	16	16	16	16	16	16	16
TT Mix Code	DC7	DC7	DC7	DC7	DC7	DC7	DC7
Mix ID	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2288.6	2287.7	2289.2	2288.9	2289.1	2289.6	2290
Submerged Weight, g (B)	1234.5	1230.2	1234.1	1234.6	1229.8	1233.6	1237.9
SSD Weight, g (C)	2303.5	2302	2302.3	2304.6	2301.9	2302.4	2305.2
Bulk Specific Gravity, Gmb	2.141	2.134	2.143	2.139	2.135	2.142	2.146
% Water Absorbed by Volume	2.0	1.9	1.7	2.1	1.7	1.7	2.0
Theoretical Maximum Density, Gmm	2.300	2.300	2.300	2.300	2.300	2.300	2.300
% Voids in Total Mix (VTM)	**6.9**	**7.2**	**6.8**	**7.0**	**7.2**	**6.9**	**6.7**
% Compaction	93.1	92.8	93.2	93.0	92.8	93.1	93.3
Specimen Average Thickness (mm)					62.0	62.0	62.0
Performance Test	HWT	HWT	HWT	HWT	Ideal-RT	Ideal-RT	Ideal-RT
Date Sent	2/25/2020	2/25/2020	2/25/2020	2/25/2020			
To Whom	Ingevity	Ingevity	Ingevity	Ingevity			
Ideal-RT Load (KN)					5.959	6.459	5.696
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.801	1.952	1.721
HWT Rut Depth @ 5,000 passes (mm)	2.59		1.99				
HWT Rut Depth @ 10,000 passes (mm)	3.31		2.28				
HWT Rut Depth @ 20,000 passes (mm)	6.43		2.82				
HWT Creep Slope	0.0001218		-4.069E-06				
HWT Stripping Slope	0.0006172		-4.11E-06				
Stripping Inflection Point (SIP)	16190		20991				
Stripping Number (LC_{SN})	5791		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	2.31E-06		4.80E-07				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	20867		-				
Corrected $RD_{10,000}$	3.19		2.32				
Corrected $RD_{20,000}$	3.91		2.71				
Terminal Rut Depth (mm)	6.43		2.82				
Terminal Rut Depth (in)	0.25		0.11				
Terminal Wheel Passes (N_{max})	20002		20002				
Rutting Resistance Index (RRI)	14939		17781				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							

Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	DC76.5-2-8	DC76.5-2-9	DC76.5-2-14	DC76.5-2-14	DC76.5-2-14	DC76.5-4-1	DC76.5-4-2
Date Compacted							
Mix Number	16	16	16	16	16	16	16
TT Mix Code	DC7	DC7	DC7	DC7	DC7	DC7	DC7
Mix ID	D4	D4	D4	D4	D4	D4	D4
Mix Type	D	D	D	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2289.8					2290.6	2289.6
Submerged Weight, g (B)	1234.5					1236.7	1234
SSD Weight, g (C)	2302.8					2303.8	2302.4
Bulk Specific Gravity, Gmb	2.143	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.147	2.143
% Water Absorbed by Volume	1.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.7	1.7
Theoretical Maximum Density, Gmm	2.300	2.300	2.300	2.300	2.300	2.300	2.300
% Voids in Total Mix (VTM)	**6.8**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.7**	**6.8**
% Compaction	93.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.3	93.2
Specimen Average Thickness (mm)	62.0						
Performance Test	Ideal-RT					Ideal-CT	Ideal-CT
Date Sent						2/25/2020	2/25/2020
To Whom						Ingevity	Ingevity
Ideal-RT Load (KN)	6.165						
Ideal-RT Shear Strength (MPa)	1.863	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						8828	9862
Ideal-CT Post-Peak Slope (S)						7.42	5.34
Ideal-CT G_f/S						1190	1845

Displacement (mm)						4.23	5.18
Ideal-CT - CT Index						34	64

Pill Designation	DC76.5-4-3	DC76.5-4-4	DC76.5-4-5	DC76.5-4-6
Date Compacted				
Mix Number	16	16	16	16
TT Mix Code	DC7	DC7	DC7	DC7
Mix ID	D4	D4	D4	D4
Mix Type	D	D	D	D
Producer	Delta Contracting	Delta Contracting	Delta Contracting	Delta Contracting
TDOT JMF#	4190198	4190198	4190198	4190198
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22
Additive	TS 23	TS 23	TS 23	TS 23
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	6.5	6.5	6.5	6.5
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2290.9	2289.6		
Submerged Weight, g (B)	1238.8	1232.1		
SSD Weight, g (C)	2303	2300.7		
Bulk Specific Gravity, Gmb	2.153	2.143	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.6	1.5	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.300	2.300	2.300	2.300
% Voids in Total Mix (VTM)	**6.4**	**6.8**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.6	93.2	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal-CT	Ideal-CT		
Date Sent	2/25/2020	2/25/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	8902	9124		
Ideal-CT Post-Peak Slope (S)	7.75	6.77		
Ideal-CT G_f/S	1149	1348		

Displacement (mm)	4.02	4.77		
Ideal-CT - CT Index	31	43		

Pill Designation	LR64.3-2-1	LR64.3-2-2	LR64.3-2-4	LR64.3-2-3	LR64.3-2-5	LR64.3-2-6	LR64.3-2-7
Date Compacted							
Mix Number	17	17	17	17	17	17	17
TT Mix Code	LR6	LR6	LR6	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2368.3	2375.7	2360.1	2365.3	2367.7	2374.5	2366.1
Submerged Weight, g (B)	1367.1	1375	1370.3	1371.1	1364.8	1375.2	1362.7
SSD Weight, g (C)	2379.9	2391.5	2377.6	2385.1	2381.2	2391.7	2384.2
Bulk Specific Gravity, Gmb	2.338	2.337	2.343	2.333	2.329	2.336	2.316
% Water Absorbed by Volume	1.1	1.6	1.7	2.0	1.3	1.7	1.8
Theoretical Maximum Density, Gmm	2.481	2.481	2.481	2.481	2.481	2.481	2.481
% Voids in Total Mix (VTM)	5.7	5.8	5.6	6.0	6.1	5.8	6.6
% Compaction	94.3	94.2	94.4	94.0	93.9	94.2	93.4
Specimen Average Thickness (mm)	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Performance Test	Ideal-RT	Ideal-RT	Ideal-RT	HWT	HWT	Ideal-RT	HWT
Date Sent				2/12/2020	2/12/2020		2/12/2020
To Whom				Ingevity	Ingevity		Ingevity
Ideal-RT Load (KN)	4.290	3.959	3.752			3.799	
Ideal-RT Shear Strength (MPa)	1.340	1.236	1.172			1.186	
HWT Rut Depth @ 5,000 passes (mm)				2.37			3.
HWT Rut Depth @10,000 passes (mm)				2.69			4.
HWT Rut Depth @ 20,000 passes (mm)				3.14			5.
HWT Creep Slope				-5.609E-05			-2.08
HWT Stripping Slope				-5.614E-05			-2.09
Stripping Inflection Point (SIP)				20994			20
Stripping Number (LC_{SN})				>20002			>20
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				5.79E-07			1.10
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})				-			
Corrected $RD_{10,000}$				2.70			4.
Corrected $RD_{20,000}$				3.16			5.
Terminal Rut Depth (mm)				3.14			5.
Terminal Rut Depth (in)				0.12			0.
Terminal Wheel Passes (N_{max})				20002			20
Rutting Resistance Index (RRI)				17529			15
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							

Ideal-CT - CT Index							
These 1-8 2 hour and 1-4 4 hour were reheated and they are 60mm rather than 62mm.							

Pill Designation	LR64.3-2-8	LR64.3-2-9	LR64.3-2-10	LR64.3-2-11	LR64.3-2-12	LR64.3-2-13	LR64.3-2-14
Date Compacted							
Mix Number	17	17	17	17	17	17	17
TT Mix Code	LR6	LR6	LR6	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2377.2	2364.2	2369.3	2368.1	2369.4	2364.5	2368.6
Submerged Weight, g (B)	1369.5	1371.7	1364.7	1362.3	1357	1365	1361.8
SSD Weight, g (C)	2394.1	2402	2402.1	2394.2	2396.5	2392.9	2401.8
Bulk Specific Gravity, Gmb	2.320	2.295	2.284	2.295	2.279	2.300	2.278
% Water Absorbed by Volume	1.6	3.7	3.2	2.5	2.6	2.8	3.2
Theoretical Maximum Density, Gmm	2.481	2.481	2.481	2.481	2.481	2.481	2.481
% Voids in Total Mix (VTM)	6.5	7.5	7.9	7.5	8.1	7.3	8.2
% Compaction	93.5	92.5	92.1	92.5	91.9	92.7	91.8
Specimen Average Thickness (mm)	60.0	62.0	62.0	62.0	62.0	62.0	62.0
Performance Test	HWT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT
Date Sent	2/12/2020						
To Whom	Ingevity						
Ideal-RT Load (KN)		2.754	2.575	2.635	2.638	2.671	2.612
Ideal-RT Shear Strength (MPa)		0.832	0.778	0.796	0.797	0.807	0.789
HWT Rut Depth @ 5,000 passes (mm)	57						
HWT Rut Depth @10,000 passes (mm)	38						
HWT Rut Depth @ 20,000 passes (mm)	20						
HWT Creep Slope	7E-05						
HWT Stripping Slope	2E-05						
Stripping Inflection Point (SIP)	992						
Stripping Number (LC_{SN})	002						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	E-06						
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$	35						
Corrected $RD_{20,000}$	23						
Terminal Rut Depth (mm)	21						
Terminal Rut Depth (in)	21						
Terminal Wheel Passes (N_{max})	002						
Rutting Resistance Index (RRI)	399						
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							

Ideal-CT - CT Index							
These 1-8 2 hour and 1-4 4 hour were reh							

Pill Designation	LR64.3-2-15	LR64.3-2-16	LR64.3-2-17	LR64.3-2-18	LR64.3-2-19	LR64.3-2-20	LR64.3-2-21
Date Compacted							
Mix Number	17	17	17	17	17	17	17
TT Mix Code	LR6	LR6	LR6	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2365.8	2368.6	2382.3	2373.3	2377.9	2379.2	2378.1
Submerged Weight, g (B)	1361.8	1364.2	1381.0	1369.00	1374.7	1380.3	1379.9
SSD Weight, g (C)	2395.7	2399.4	2426.2	2419.5	2424.8	2432.8	2429.7
Bulk Specific Gravity, Gmb	2.288	2.288	2.279	2.259	2.264	2.261	2.265
% Water Absorbed by Volume	2.9	3.0	4.2	4.4	4.5	5.1	4.9
Theoretical Maximum Density, Gmm	2.481	2.481	2.481	2.481	2.481	2.481	2.481
% Voids in Total Mix (VTM)	**7.8**	**7.8**	**8.1**	**8.9**	**8.7**	**8.9**	**8.7**
% Compaction	92.2	92.2	91.9	91.1	91.3	91.1	91.3
Specimen Average Thickness (mm)	62.0	62.0	62.0	62.0	62.0	62.0	62.0
Performance Test	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT
Date Sent							
To Whom							
Ideal-RT Load (KN)	2.132	3.626	2.297	2.557	2.552	2.544	2.281
Ideal-RT Shear Strength (MPa)	0.644	1.096	0.694	0.773	0.771	0.769	0.689
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							

Ideal-CT - CT Index							
These 1-8 2 hour and 1-4 4 hour were reh							

Pill Designation	LR64.3-2-22	LR64.3-2-23	LR64.3-2-24	LR64.3-4-1	LR64.3-4-2	LR64.3-4-3	LR64.3-4-4
Date Compacted							
Mix Number	17	17	17	17	17	17	17
TT Mix Code	LR6	LR6	LR6	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.3	4.3	4.3				
Age Time	2	2	2	4	4	4	4
Dry Weight in Air, g (A)	2375.9	2372	2377.1	2372.7	2367.5	2367.3	2364.2
Submerged Weight, g (B)	1376.5	1373.7	1372.0	1368.1	1362.2	1366.9	1358.5
SSD Weight, g (C)	2425.2	2411.6	2422.2	2388.3	2389	2388.1	2385.8
Bulk Specific Gravity, Gmb	2.266	2.285	2.263	2.326	2.306	2.318	2.301
% Water Absorbed by Volume	4.7	3.8	4.3	1.5	2.1	2.0	2.1
Theoretical Maximum Density, Gmm	2.481	2.481	2.481	2.481	2.481	2.481	2.481
% Voids in Total Mix (VTM)	8.7	7.9	8.8	6.3	7.1	6.6	7.2
% Compaction	91.3	92.1	91.2	93.7	92.9	93.4	92.8
Specimen Average Thickness (mm)	62.0	62.0	62.0	60.0	60.0	60.0	60.0
Performance Test	Ideal RT	Ideal RT	Ideal RT	Ideal CT	Ideal CT	Ideal CT	Ideal CT
Date Sent				2/12/2020	2/12/2020	2/12/2020	2/12/2020
To Whom				Ingevity	Ingevity	Ingevity	Ingevity
Ideal-RT Load (KN)	2.637	2.864	2.977				
Ideal-RT Shear Strength (MPa)	0.797	0.866	0.900				
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)				8639	6982	8393	7274
Ideal-CT Post-Peak Slope (S)				2.80	2.72	3.42	3.60
Ideal-CT G_f/S				3090	2562	2453	2023
Displacement (mm)				4.15	4.35	4.46	5.60

Ideal-CT - CT Index				86	74	73	75
These 1-8 2 hour and 1-4 4 hour were reh							

Pill Designation	LR64.3-4-5	LR64.3-4-6	LR64.3-4-7	LR64.3-4-8
Date Compacted				
Mix Number	17	17	17	17
TT Mix Code	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content				
Age Time	4	4	4	4
Dry Weight in Air, g (A)				
Submerged Weight, g (B)				
SSD Weight, g (C)				
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.481	2.481	2.481	2.481
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test				
Date Sent				
To Whom				
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)				
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)				
Ideal-CT Post-Peak Slope (S)				
Ideal-CT G_f/S				
Displacement (mm)				

Ideal-CT - CT Index				
These 1-8 2 hour and 1-4 4 hour were reh				

Pill Designation	LR64.8-2-1	LR64.8-2-2	LR64.8-2-3	LR64.8-2-4	LR64.8-2-5	LR64.8-2-6	LR64.8-2-7
Date Compacted							
Mix Number	18	18	18	18	18	18	18
TT Mix Code	LR6	LR6	LR6	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2366.6	2366.4	2341.5	2369.1	2364.7	2365.4	2364.8
Submerged Weight, g (B)	1361.5	1361	1349.3	1361.2	1358.7	1366.4	1360.7
SSD Weight, g (C)	2401.3	2400.6	2388.4	2404.3	2400.7	2404.5	2400
Bulk Specific Gravity, Gmb	2.276	2.276	2.253	2.271	2.269	2.279	2.275
% Water Absorbed by Volume	3.3	3.3	4.5	3.4	3.5	3.8	3.4
Theoretical Maximum Density, Gmm	2.463	2.463	2.463	2.463	2.463	2.463	2.463
% Voids in Total Mix (VTM)	7.6	7.6	8.5	7.8	7.9	7.5	7.6
% Compaction	92.4	92.4	91.5	92.2	92.1	92.5	92.4
Specimen Average Thickness (mm)			61.7	61.6	61.4		
Performance Test	HWT	HWT	Ideal RT	Ideal RT	Ideal RT	HWT	HWT
Date Sent	1/6/2020	1/6/2020	1/9/2020	1/9/2020	1/9/2020	1/6/2020	1/6/2020
To Whom	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia	Ingevity	Ingevity
Ideal-RT Load (KN)			1.86	1.882	2.053		
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	0.565	0.572	0.627	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)	3.89					4.78	
HWT Rut Depth @ 10,000 passes (mm)	4.85					6.08	
HWT Rut Depth @ 20,000 passes (mm)	6.53					7.72	
HWT Creep Slope	-8.989E-05					4.789E-06	
HWT Stripping Slope	-9.00E-05					4.716E-06	
Stripping Inflection Point (SIP)	20995					20991	
Stripping Number (LC_{SN})	>20002					>20002	
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.70E-06					2.08E-06	
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	-					-	
Corrected $RD_{10,000}$	5.08					6.10	
Corrected $RD_{20,000}$	6.41					7.72	
Terminal Rut Depth (mm)	6.52					7.70	
Terminal Rut Depth (in)	0.26					0.30	
Terminal Wheel Passes (N_{max})	20002					20002	
Rutting Resistance Index (RRI)	14868					13938	
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	LR64.8-2-8	LR64.8-2-9	LR64.8-2-10	LR64.8-2-11	LR64.8-2-12	LR64.8-4-1	LR64.8-4-2
Date Compacted							
Mix Number	18	18	18	18	18	18	18
TT Mix Code	LR6	LR6	LR6	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2360.1					2369.6	2364.9
Submerged Weight, g (B)	1363					1357.8	1370.1
SSD Weight, g (C)	2392.3					2405.4	2406.8
Bulk Specific Gravity, Gmb	2.293	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.262	2.281
% Water Absorbed by Volume	3.1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3.4	4.0
Theoretical Maximum Density, Gmm	2.463	2.463	2.463	2.463	2.463	2.463	2.463
% Voids in Total Mix (VTM)	6.9	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	8.2	7.4
% Compaction	93.1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	91.8	92.6
Specimen Average Thickness (mm)							
Performance Test						Ideal CT	Ideal CT
Date Sent						1/6/2020	1/6/2020
To Whom						Ingevity	Ingevity
Ideal-RT Load (KN)							
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						7821	7537
Ideal-CT Post-Peak Slope (S)						1.68	1.99

Ideal-CT G_f/S						4658	3782
Displacement (mm)						5.77	5.59
Ideal-CT - CT Index						179	140

Pill Designation	LR64.8-4-3	LR64.8-4-4	LR64.8-4-5	LR64.8-4-6	LR64.8-4-7	LR64.8-4-8
Date Compacted						
Mix Number	18	18	18	18	18	18
TT Mix Code	LR6	LR6	LR6	LR6	LR6	LR6
Mix ID	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8	4.8	4.8
Age Time	4	4	4	4	4	4
Dry Weight in Air, g (A)	2366.5	2367.9				
Submerged Weight, g (B)	1362.1	1370.6				
SSD Weight, g (C)	2406.8	2409.1				
Bulk Specific Gravity, Gmb	2.265	2.280	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	3.9	4.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.463	2.463	2.463	2.463	2.463	2.463
% Voids in Total Mix (VTM)	**8.0**	**7.4**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.0	92.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)						
Performance Test	Ideal CT	Ideal CT				
Date Sent	1/6/2020	1/6/2020				
To Whom	Ingevity	Ingevity				
Ideal-RT Load (KN)						
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)						
HWT Rut Depth @ 10,000 passes (mm)						
HWT Rut Depth @ 20,000 passes (mm)						
HWT Creep Slope						
HWT Stripping Slope						
Stripping Inflection Point (SIP)						
Stripping Number (LC_{SN})						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})						
Corrected $RD_{10,000}$						
Corrected $RD_{20,000}$						
Terminal Rut Depth (mm)						
Terminal Rut Depth (in)						
Terminal Wheel Passes (N_{max})						
Rutting Resistance Index (RRI)						
Ideal-CT Fracture Energy (G_f)	6729	6375				
Ideal-CT Post-Peak Slope (S)	1.83	2.42				

Ideal-CT G_f/S	3686	2634				
Displacement (mm)	5.40	5.06				
Ideal-CT - CT Index	132	89				

PII Designation	LR74.3-2-1	LR74.3-2-2	LR74.3-2-3	LR74.3-2-4	LR74.3-2-5	LR74.3-2-6	LR74.3-2-7	LR74.3-2-8	LR74.3-2-9	LR74.3-2-12	LR74.3-2-10	LR74.3-2-11	LR74.3-4-1	LR74.3-4-2	LR74.3-4-3	LR74.3-4-4	LR74.3-4-5	LR74.3-4-6	LR74.3-4-7	LR74.3-4-8
Date Compacted	9/11/2019	9/11/2019	9/11/2019	9/11/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/11/2019	9/11/2019	9/11/2019	9/11/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019
Mix Number	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
TT Mix Code	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7
Mix ID	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700	AD-HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Age Time	2	2	2	2	2	2	2	2	2	2	2	2	1	4	4	1	4	4	4	1
Dry Weight in Air, g (A)	2379.5	2374	2450.3	2450.5	2377.5	2369.5	2370.1	2376.7	2381	2385	2380.2	2381.2	2371.3	2370.9	2451.9	2448.6	2377	2374.4	2371.7	2374.8
Submerged Weight, g (B)	1378.8	1375.1	1424.4	1422.1	1364.4	1375.3	1377	1373.7	1365.7	1382.4	1383.8	1385.6	1363.6	1383.8	1416.8	1438.4	1375	1383.8	1372	1373.8
SSD Weight, g (C)	2407.2	2411.3	2473.3	2470.5	2406.5	2413.6	2397.5	2408.8	2406.1	2425	2410.8	2411.9	2399.3	2405.9	2470.6	2469.1	2403	2423.1	2410	2408.9
Bulk Specific Gravity, Gmb	2.314	2.291	2.336	2.337	2.281	2.282	2.322	2.296	2.289	2.288	2.318	2.320	2.290	2.300	2.327	2.376	2.29	2.285	2.285	2.294
% Water Absorbed by Volume	2.7	3.8	2.2	1.9	2.8	4.2	2.7	3.1	2.4	3.8	3.0	3.0	2.7	3.4	1.8	2.0	3.1	4.7	3.7	3.3
Theoretical Maximum Density, Gmm																				
% Voids in Total Mix (VTM)	6.7	7.7	5.8	5.8	8.0	8.0	6.4	7.5	7.8	7.8	6.6	6.5	7.7	6.5	6.2	4.2	7.9	7.9	7.9	7.5
% Compaction	93.3	92.3	94.2	94.2	92.0	92.0	93.6	92.5	92.2	92.2	93.4	93.5	92.3	93.5	93.8	95.8	92.1	92.1	92.1	92.5
Specimen Average Thickness (mm)		62.0	61.7	61.6	61.7															
Performance Test		Ideal RT	Ideal RT	Ideal RT	Ideal RT	HWT	HWT		HWT	HWT			Ideal CT	Ideal CT			Ideal			Ideal CT
Date Sent		43838	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020		1/8/2020	1/8/2020			1/8/2020	1/8/2020			1/8/2020			1/8/2020
To Whom		Cynthia	Cynthia	Cynthia	Cynthia	Ingevity	Ingevity		Ingevity	Ingevity			Ingevity	Ingevity			Ingev			Ingevity
Ideal-RT Load (KN)		5.261	7.63	6.549	4.495															
Ideal-RT Shear Strength (MPa)	#DIV/0!	1.590	2.316	1.992	1.366	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)						2.27			2.46											
HWT Rut Depth @ 10,000 passes (mm)						2.72			2.90											
HWT Rut Depth @ 20,000 passes (mm)						3.13			3.38											
HWT Creep Slope						-8.164E-05			-5.683E-05											
HWT Stripping Slope						-8.169E-05			-5.688E-05											
Stripping Inflection Point (SIP)						20991			20982											
Stripping Number (LC_{SN})						>20002			>20002											
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						6.21E-07			6.72E-07											
Stripping Strain (ε^{vp})																				
Stripping Life (LC_{ST})						-			-											
Corrected $RD_{10,000}$						2.71			2.88											
Corrected $RD_{20,000}$						3.20			3.42											
Terminal Rut Depth (mm)						3.12			3.39											
Terminal Rut Depth (in)						0.12			0.13											
Terminal Wheel Passes (N_{max})						20002			20002											
Rutting Resistance Index (RRI)						17545			17332											
Ideal-CT Fracture Energy (Gj)													8848	11030			88			9271
Ideal-CT Post-Peak Slope (S)													2.81	3.30			5.1			4.33
Ideal-CT Gj/S													3145	3341			154			2141
Displacement (mm)													5.60	5.43			Err			4.44
Ideal-CT - CT Index													117	121			9			63

Pill Designation	LR74.8-2-1	LR74.8-2-2	LR74.8-2-3	LR74.8-2-4	LR74.8-2-5	LR74.8-2-6	LR74.8-2-7	LR74.8-2-8	LR74.8-2-9	LR74.8-2-12	LR74.8-2-10	LR74.8-2-11	LR74.8-4-1	LR74.8-4-2	LR74.8-4-3	LR74.8-4-4	LR74.8-4-5	LR74.8-4-6	LR74.8-4-7	LR74.8-4-8
Date Compacted	9/11/2019	9/11/2019	9/11/2019	9/11/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	9/25/2019	10/30/2019	10/30/2019	10/30/2019	10/30/2019	11/6/2019	11/6/2019	11/6/2019	11/6/2019
Mix Number	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
TT Mix Code	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7	LR7
Mix ID	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts	Lehman Roberts
TDOT JMF#	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018	4190018
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700	AD+HERE 7700
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Age Time	2	2	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4
Dry Weight in Air, g (A)	2368.4	2397.6	2440.3	2438.6	2371.5	2370.2	2367.6	2368.1	2368.8	2366.1	2373.3	2363.9	2367.7	2367.5	2440.1	2443.3	2364.4	2361.9	2363.6	2365.9
Submerged Weight, g (B)	1354.5	1390.4	1410.8	1410	1362.3	1353.7	1368.7	1363.3	1368.4	1377.6	1377.3	1354.6	1367.8	1364.9	1404.5	1420.5	1366.1	1363.8	1359.2	1370.9
SSD Weight, g (C)	2392.9	2428.6	2458.7	2456.1	2408.8	2395.7	2398.7	2392.7	2393	2392.9	2409.9	2389.5	2405.7	2392.3	2455.7	2483.3	2402.8	2396.9	2395.4	2399.3
Bulk Specific Gravity, Gmb	2.281	2.309	2.329	2.331	2.266	2.275	2.299	2.301	2.312	2.330	2.298	2.284	2.281	2.304	2.321	2.343	2.281	2.286	2.281	2.301
% Water Absorbed by Volume	2.4	3.0	1.8	1.7	3.6	2.4	3.0	2.3	2.4	2.6	3.5	2.5	3.7	2.4	1.5	1.9	3.7	3.4	3.1	3.2
[illegible]																				
% Voids in Total Mix (VTM)	7.4	6.2	5.5	5.4	8.0	7.6	6.7	6.6	6.1	5.4	6.7	7.3	7.4	6.4	5.8	4.9	7.4	7.2	7.4	6.6
% Compaction	92.6	93.8	94.5	94.6	92.0	92.4		93.4	93.9	94.6	93.3	92.7	92.6	93.6	94.2	95.1	92.6	92.8	92.6	93.4
Specimen Average Thickness (mm)	62.0	62.0	61.8	61.7						93.3										
Performanc Test	Ideal RT	Ideal RT	Ideal RT	Ideal RT	HWT	HWT			HWT	HWT			Ideal CT				Ideal CT	Ideal CT	Ideal CT	Ideal CT
Date Sent	43838	43838	1/8/2020	1/8/2020	1/8/2020	1/8/2020			1/8/2020	1/8/2020							1/8/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Cynthia	Cynthia	Cynthia	Cynthia	lngevity	lngevity			lngevity	lngevity			lngevity				lngevity	lngevity	lngevity	lngevity
Ideal-RT Load (KN)	4.818	5.662	4.571	4.351																
Ideal-RT Shear Strength (MPa)	1.456	1.711	1.386	1.321	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#VALUE!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)					2.15				2.28											
HWT Rut Depth @ 10,000 passes (mm)					2.65				2.69											
HWT Rut Depth @ 20,000 passes (mm)					3.18				3.19											
HWT Creep Slope					-5.516E-06				-4.544E-05											
HWT Stripping Slope					-5.584E-06				-4.548E-05											
Stripping Inflection Point (SIP)					20992				20989											
Stripping Number (LC_{PW})					>192063.13				>201703.19											
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)					6.13E-07				5.90E-07											
Stripping Strain (ε_r^{vp})																				
Stripping Life (LC_{SP})					-				-											
Corrected $RD_{10,000}$					2.63				2.73											
Corrected $RD_{20,000}$					3.21				3.31											
Terminal Rut Depth (mm)					3.18				3.19											
Terminal Rut Depth (in)					0.13				0.13											
Terminal Wheel Passes (N_{max})					20020				20000											
Rutting Resistance Index (RRI)					17514				17488											
Ideal-CT Fracture Energy (Gf)																	11032	10073	10407	9050
Ideal-CT Post-Peak Slope (ß)																	2.33	3.68	3.24	3.56
Ideal-Cf Gp/S																	4730	2734	3214	2541
Displacement (mm)																	5.71	5.72	6.09	4.81
Ideal-CT - CT Index																	180	104	131	82

Pill Designation	RG64.2-2-1	RG64.2-2-2	RG64.2-2-3	RG64.2-2-4	RG64.2-2-5	RG64.2-2-6	RG64.2-2-7
Date Compacted							
Mix Number	21	21	21	21	21	21	21
TT Mix Code	RG6	RG6	RG6	RG6	RG6	RG6	RG6
Mix ID	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2497.5	2499.9	2505.3	2500	2504.3	2508.9	2508.3
Submerged Weight, g (B)	1444.5	1441.4	1456.4	1450.2	1453.8	1461.7	1457.6
SSD Weight, g (C)	2516.5	2522	2525.8	2520.4	2521.7	2534.5	2523.2
Bulk Specific Gravity, Gmb	2.330	2.313	2.343	2.336	2.345	2.339	2.354
% Water Absorbed by Volume	1.8	2.0	1.9	1.9	1.6	2.4	1.4
Theoretical Maximum Density, Gmm	2.528	2.528	2.528	2.528	2.528	2.528	2.528
% Voids in Total Mix (VTM)	**7.8**	**8.5**	**7.3**	**7.6**	**7.2**	**7.5**	**6.9**
% Compaction	92.2	91.5	92.7	92.4	92.8	92.5	93.1
Specimen Average Thickness (mm)					62.0	62.0	62.0
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					2.779	3.876	4.091
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.840	1.171	1.236
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							
Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	RG64.2-2-8	RG64.2-2-9	RG64.2-2-10	RG64.2-2-11	RG64.2-2-12	RG64.2-4-1	RG64.2-4-2
Date Compacted							
Mix Number	21	21	21	21	21	21	21
TT Mix Code	RG6	RG6	RG6	RG6	RG6	RG6	RG6
Mix ID	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2510.8	2510.5	2506.9	2507.2	2508.8	2507.7	2506.7
Submerged Weight, g (B)	1458.1	1449.5	1448.2	1447.6	1445.2	1451.9	1459.5
SSD Weight, g (C)	2527.3	2530.4	2525.4	2522.8	2519.6	2521.8	2531.9
Bulk Specific Gravity, Gmb	2.348	2.323	2.327	2.332	2.335	2.344	2.337
% Water Absorbed by Volume	1.5	1.8	1.7	1.5	1.0	1.3	2.3
Theoretical Maximum Density, Gmm	2.528	2.528	2.528	2.528	2.528	2.528	2.528
% Voids in Total Mix (VTM)	7.1	8.1	7.9	7.8	7.6	7.3	7.5
% Compaction	92.9	91.9	92.1	92.2	92.4	92.7	92.5
Specimen Average Thickness (mm)	62.0						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/8/2020	1/8/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	3.499						
Ideal-RT Shear Strength (MPa)	1.057	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)		1.20		2.54			
HWT Rut Depth @ 10,000 passes (mm)		1.52		2.97			
HWT Rut Depth @ 20,000 passes (mm)		1.91		3.80			
HWT Creep Slope		9.93E-06		1.658E-05			
HWT Stripping Slope		9.92E-06		1.654E-05			
Stripping Inflection Point (SIP)		20998		20993			
Stripping Number (LC_{SN})		>20002		>20002			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)		4.95E-07		7.71E-07			
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})		-		-			
Corrected $RD_{10,000}$		1.54		3.05			
Corrected $RD_{20,000}$		1.93		3.67			
Terminal Rut Depth (mm)		1.97		3.90			
Terminal Rut Depth (in)		0.08		0.15			
Terminal Wheel Passes (N_{max})		20998		21000			
Rutting Resistance Index (RRI)		19369		17776			
Ideal-CT Fracture Energy (G_f)						9046	8640
Ideal-CT Post-Peak Slope (S)						6.19	4.77
Ideal-CT G_f/S						1461	1812
Displacement (mm)						3.72	4.29
Ideal-CT - CT Index						236	52

Pill Designation	RG64.2-4-3	RG64.2-4-4	RG64.2-4-9	RG64.2-4-10	RG64.2-4-11	RG64.2-4-12
Date Compacted						
Mix Number	21	21	21	21	21	21
TT Mix Code	RG6	RG6	RG6	RG6	RG6	RG6
Mix ID	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.2	4.2	4.2	4.2	4.2	4.2
Age Time	4	4	4	4	4	4
Dry Weight in Air, g (A)	2510.4	2509.9	2510.5	2506.9	2507.2	2508.8
Submerged Weight, g (B)	1459.5	1462.3	1449.5	1448.2	1447.6	1445.5
SSD Weight, g (C)	2527.3	2531.2	2530.4	2525.4	2522.8	2519.6
Bulk Specific Gravity, Gmb	2.351	2.348	2.323	2.327	2.332	2.336
% Water Absorbed by Volume	1.6	2.0	1.8	1.7	1.5	1.0
Theoretical Maximum Density, Gmm	2.528	2.528	2.528	2.528	2.528	2.528
% Voids in Total Mix (VTM)	**7.0**	**7.1**	**8.1**	**7.9**	**7.8**	**7.6**
% Compaction	93.0	92.9	91.9	92.1	92.2	92.4
Specimen Average Thickness (mm)						
Performance Test	Ideal CT	Ideal CT				
Date Sent	1/8/2020	1/8/2020				
To Whom	Ingevity	Ingevity				
Ideal-RT Load (KN)						
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!			#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)						
HWT Rut Depth @ 10,000 passes (mm)						
HWT Rut Depth @ 20,000 passes (mm)						
HWT Creep Slope						
HWT Stripping Slope						
Stripping Inflection Point (SIP)						
Stripping Number (LC_{SN})						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})						
Corrected $RD_{10,000}$						
Corrected $RD_{20,000}$						
Terminal Rut Depth (mm)						
Terminal Rut Depth (in)						
Terminal Wheel Passes (N_{max})						
Rutting Resistance Index (RRI)						
Ideal-CT Fracture Energy (G_f)	8442	8253				
Ideal-CT Post-Peak Slope (S)	8.61	7.62				
Ideal-CT G_f/S	980	1082				
Displacement (mm)	3.63	3.36				
Ideal-CT - CT Index	24	24				

Pill Designation	RG64.7-2-1	RG64.7-2-2	RG64.7-2-3	RG64.7-2-4	RG64.7-2-5	RG64.7-2-6	RG64.7-2-7
Date Compacted							
Mix Number	22	22	22	22	22	22	22
TT Mix Code	RG6	RG6	RG6	RG6	RG6	RG6	RG6
Mix ID	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2489.8	2487.7	2487.9	2493.3	2489.5	2488.6	2489.9
Submerged Weight, g (B)	1439.6	1439.4	1433.1	1438.4	1439.3	1445.5	1439.3
SSD Weight, g (C)	2506.6	2502.5	2501.3	2506.6	2506.8	2508.9	2502.7
Bulk Specific Gravity, Gmb	2.333	2.340	2.329	2.334	2.332	2.340	2.341
% Water Absorbed by Volume	1.6	1.4	1.3	1.2	1.6	1.9	1.2
Theoretical Maximum Density, Gmm	2.510	2.510	2.510	2.510	2.510	2.510	2.510
% Voids in Total Mix (VTM)	**7.0**	**6.8**	**7.2**	**7.0**	**7.1**	**6.8**	**6.7**
% Compaction	93.0	93.2	92.8	93.0	92.9	93.2	93.3
Specimen Average Thickness (mm)					61.9	61.9	61.9
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					3.042	2.653	3.725
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.921	0.804	1.128
HWT Rut Depth @ 5,000 passes (mm)	3.31		2.20				
HWT Rut Depth @ 10,000 passes (mm)	4.00		2.66				
HWT Rut Depth @ 20,000 passes (mm)	5.10		3.22				
HWT Creep Slope	-1.223E-05		-4.401E-05				
HWT Stripping Slope	-1.229E-05		-4.406E-05				
Stripping Inflection Point (SIP)	20991		20985				
Stripping Number (LC_{SN})	>20002		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.10E-06		6.79E-07				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	-		-				
Corrected $RD_{10,000}$	4.06		2.66				
Corrected $RD_{20,000}$	4.94		3.20				
Terminal Rut Depth (mm)	5.22		3.26				
Terminal Rut Depth (in)	0.21		0.13				
Terminal Wheel Passes (N_{max})	21000		21000				
Rutting Resistance Index (RRI)	16684		18305				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	RG64.7-2-8	RG64.7-2-9	RG64.7-2-10	RG64.7-2-11	RG64.7-2-12	RG64.7-4-1	RG64.7-4-2
Date Compacted							
Mix Number	22	22	22	22	22	22	22
TT Mix Code	RG6	RG6	RG6	RG6	RG6	RG6	RG6
Mix ID	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2493.2					2487.6	2489.9
Submerged Weight, g (B)	1438.8					1439.6	1441.5
SSD Weight, g (C)	2509.3					2502.8	2509.4
Bulk Specific Gravity, Gmb	2.329	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.340	2.332
% Water Absorbed by Volume	1.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.4	1.8
Theoretical Maximum Density, Gmm	2.510	2.510	2.510	2.510	2.510	2.510	2.510
% Voids in Total Mix (VTM)	**7.2**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.8**	**7.1**
% Compaction	92.8	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.2	92.9
Specimen Average Thickness (mm)	62.1						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/8/2020	1/8/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	2.908						
Ideal-RT Shear Strength (MPa)	0.878	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						8257	8102
Ideal-CT Post-Peak Slope (S)						5.28	2.93

Ideal-CT G_f/S						1564	2767
Displacement (mm)						3.83	5.46
Ideal-CT - CT Index						40	101

Pill Designation	RG64.7-4-3	RG64.7-4-4	RG64.7-4-5	RG64.7-4-6
Date Compacted				
Mix Number	22	22	22	22
TT Mix Code	RG6	RG6	RG6	RG6
Mix ID	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	4.7	4.7	4.7	4.7
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2487.3	2491.3		
Submerged Weight, g (B)	1442.5	1444.8		
SSD Weight, g (C)	2505.2	2510.7		
Bulk Specific Gravity, Gmb	2.341	2.337	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.7	1.8	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.510	2.510	2.510	2.510
% Voids in Total Mix (VTM)	**6.8**	**6.9**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.2	93.1	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	1/8/2020	1/8/2020		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	8710	8940		
Ideal-CT Post-Peak Slope (S)	3.55	3.44		

Ideal-CT G_f/S	2453	2595		
Displacement (mm)	5.37	5.44		
Ideal-CT - CT Index	88	94		

Pill Designation	RG74.2-2-1	RG74.2-2-2	RG74.2-2-3	RG74.2-2-4	RG74.2-2-5	RG74.2-2-6	RG74.2-2-7	RG74.2-2-8	RG74.2-2-9
Date Compacted									
Mix Number	21	21	21	21	21	21	21	21	21
TT Mix Code	RG7	RG7	RG7	RG7	RG7	RG7	RG7	RG7	RG7
Mix ID	B2	B2	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Age Time	2	2	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2513.1	2526.2	2505.8	2534.8	2510.6	2509.8	2506.6	2511	2500.8
Submerged Weight, g (B)	1463.2	1460.8	1449.7	1468.6	1467.5	1464.7	1469.8	1466.7	1450.6
SSD Weight, g (C)	2528.7	2523.9	2518	2553.9	2528.4	2529.4	2528.8	2528.8	2519.9
Bulk Specific Gravity, Gmb	2.359	2.376	2.346	2.336	2.366	2.357	2.367	2.364	2.339
% Water Absorbed by Volume	1.5	-0.2	1.1	1.8	1.7	1.8	2.1	1.7	1.8
Theoretical Maximum Density, Gmm	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528
% Voids in Total Mix (VTM)	6.7	6.0	7.2	7.6	6.4	6.8	6.4	6.5	7.5
% Compaction	93.3	94.0	92.8	92.4	93.6	93.2	93.6	93.5	92.5
Specimen Average Thickness (mm)	62.0	62.0	62.0	62.0	62.0	62.0	62.0	62.0	62.0
Performance Test	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020	
To Whom	Cynthia	Cynthia	Cynthia	Cynthia	Cynthia	Cynthia	Cynthia	Cynthia	
Ideal-RT Load (KN)	10.913	9.389	10.563	11.625	7.302	5.474	6.28	7.699	6.321
Ideal-RT Shear Strength (MPa)	3.298	2.837	3.192	3.513	2.207	1.654	1.898	2.327	1.910
HWT Rut Depth @ 5,000 passes (mm)									
HWT Rut Depth @ 10,000 passes (mm)									
HWT Rut Depth @ 20,000 passes (mm)									
HWT Creep Slope									
HWT Stripping Slope									
Stripping Inflection Point (SIP)									
Stripping Number (LC_{SN})									
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})									
Corrected $RD_{10,000}$									
Corrected $RD_{20,000}$									
Terminal Rut Depth (mm)									
Terminal Rut Depth (in)									
Terminal Wheel Passes (N_{max})									
Rutting Resistance Index (RRI)									
Ideal-CT Fracture Energy (G_f)									
Ideal-CT Post-Peak Slope (S)									
Ideal-CT G_f/S									
Displacement (mm)									
Ideal-CT - CT Index									

Pill Designation	RG74.2-2-10	RG74.2-2-11	RG74.2-2-14	RG74.2-2-13	RG74.2-2-15	RG74.2-2-12	RG74.2-2-16	RG74.2-4-1	RG74.2-4-2
Date Compacted									
Mix Number	21	21	21	21	21	21	21	21	21
TT Mix Code	RG7	RG7	RG7	RG7	RG7	RG7	RG7	RG7	RG7
Mix ID	B2	B2	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Age Time	2	2	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2500.5	2499.2	2493.0	2496.0	2499.1	2496.5	2496.6	2505.8	2509.2
Submerged Weight, g (B)	1452.6	1437.8	1441.5	1446.3	1451.5	1442.8	1446.9	1460.2	1459.6
SSD Weight, g (C)	2512.9	2507.7	2510.9	2511.4	2516.5	2510.2	2513.5	2526.9	2536.4
Bulk Specific Gravity, Gmb	2.358	2.336	2.331	2.343	2.347	2.339	2.341	2.349	2.330
% Water Absorbed by Volume	1.2	0.8	1.7	1.4	1.6	1.3	1.6	2.0	2.5
Theoretical Maximum Density, Gmm	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528
% Voids in Total Mix (VTM)	**6.7**	**7.6**	**7.8**	**7.3**	**7.2**	**7.5**	**7.4**	**7.1**	**7.8**
% Compaction	93.3	92.4	92.2	92.7	92.8	92.5	92.6	92.9	92.2
Specimen Average Thickness (mm)	62.0	62.0	62.0					62.0	62.0
Performance Test	Ideal RT	Ideal RT	Ideal RT	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT
Date Sent								1/8/2020	1/8/2020
To Whom				Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia
Ideal-RT Load (KN)	6.557	5.762	6.207					6.971	9.035
Ideal-RT Shear Strength (MPa)	1.982	1.741	1.876		#DIV/0!		#DIV/0!	2.107	2.730
HWT Rut Depth @ 5,000 passes (mm)				1.74		2.28			
HWT Rut Depth @ 10,000 passes (mm)				1.97		2.64			
HWT Rut Depth @ 20,000 passes (mm)				2.27		3.04			
HWT Creep Slope				-3.32E-05		-1.46E-06			
HWT Stripping Slope				-3.32E-05		-1.48E-06			
Stripping Inflection Point (SIP)				20994		20983			
Stripping Number (LC_{SN})				>20002		>20002			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				3.92E-07		5.34E-07			
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})				-		-			
Corrected $RD_{10,000}$				1.98		2.62			
Corrected $RD_{20,000}$				2.30		3.05			
Terminal Rut Depth (mm)				2.31		3.09			
Terminal Rut Depth (in)				0.09		0.12			
Terminal Wheel Passes (N_{max})				21000		21000			
Rutting Resistance Index (RRI)				19090		18445			
Ideal-CT Fracture Energy (G_f)									
Ideal-CT Post-Peak Slope (S)									
Ideal-CT G_f/S									
Displacement (mm)									
Ideal-CT - CT Index									

Pill Designation	RG74.2-4-3	RG74.2-4-4	RG74.2-4-5
Date Compacted			
Mix Number	21	21	21
TT Mix Code	RG7	RG7	RG7
Mix ID	B2	B2	B2
Mix Type	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50
Asphalt Content	4.2	4.2	4.2
Age Time	4	4	4
Dry Weight in Air, g (A)	2509.8	2508.0	
Submerged Weight, g (B)	1468.4	1474.5	
SSD Weight, g (C)	2525.7	2532.6	
Bulk Specific Gravity, Gmb	2.374	2.370	#DIV/0!
% Water Absorbed by Volume	1.5	2.325	#DIV/0!
Theoretical Maximum Density, Gmm	2.528	2.528	2.528
% Voids in Total Mix (VTM)	**6.1**	**6.2**	**#DIV/0!**
% Compaction	93.9	93.8	#DIV/0!
Specimen Average Thickness (mm)			
Performance Test			
Date Sent			
To Whom			
Ideal-RT Load (KN)			
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)			
HWT Rut Depth @ 10,000 passes (mm)			
HWT Rut Depth @ 20,000 passes (mm)			
HWT Creep Slope			
HWT Stripping Slope			
Stripping Inflection Point (SIP)			
Stripping Number (LC_{SN})			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)			
Stripping Strain (ε^{vt})			
Stripping Life (LC_{ST})			
Corrected $RD_{10,000}$			
Corrected $RD_{20,000}$			
Terminal Rut Depth (mm)			
Terminal Rut Depth (in)			
Terminal Wheel Passes (N_{max})			
Rutting Resistance Index (RRI)			
Ideal-CT Fracture Energy (G_f)			
Ideal-CT Post-Peak Slope (S)			
Ideal-CT G_f/S			
Displacement (mm)			
Ideal-CT - CT Index			

Pill Designation	RG74.2-4-6	RG74.2-4-11	RG74.2-4-12	RG74.2-4-13	RG74.2-4-14	RG74.2-4-15	RG74.2-4-16	RG74.2-4-17	RG74.2-4-18
Date Compacted									
Mix Number	21	21	21	21	21	21	21	21	21
TT Mix Code	RG7	RG7	RG7	RG7	RG7	RG7	RG7	RG7	RG7
Mix ID	B2	B2	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Age Time	4	4	4	4	4	4	4	4	4
Dry Weight in Air, g (A)		2512.9	2514.4	2519.5	2519.2	2521.7	2520.0	2520.7	2520.3
Submerged Weight, g (B)		1449.2	1457.8	1459.3	1459.0	1455.0	1458.9	1459.8	1463.1
SSD Weight, g (C)		2525.3	2525.8	2531.7	2529.4	2531.9	2532.7	2533.4	2532.5
Bulk Specific Gravity, Gmb	#DIV/0!	2.335	2.354	2.349	2.354	2.342	2.347	2.348	2.357
% Water Absorbed by Volume	#DIV/0!	1.2	1.1	1.1	1.0	0.9	1.2	1.2	1.1
Theoretical Maximum Density, Gmm	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528	2.528
% Voids in Total Mix (VTM)	**#DIV/0!**	**7.6**	**6.9**	**7.1**	**6.9**	**7.4**	**7.2**	**7.1**	**6.8**
% Compaction	#DIV/0!	92.4	93.1	92.9	93.1	92.6	92.8	92.9	93.2
Specimen Average Thickness (mm)									
Performance Test									
Date Sent									
To Whom									
Ideal-RT Load (KN)									
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)									
HWT Rut Depth @ 10,000 passes (mm)									
HWT Rut Depth @ 20,000 passes (mm)									
HWT Creep Slope									
HWT Stripping Slope									
Stripping Inflection Point (SIP)									
Stripping Number (LC_{SN})									
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})									
Corrected $RD_{10,000}$									
Corrected $RD_{20,000}$									
Terminal Rut Depth (mm)									
Terminal Rut Depth (in)									
Terminal Wheel Passes (N_{max})									
Rutting Resistance Index (RRI)									
Ideal-CT Fracture Energy (G_f)		5279	5852	6724	6590	6259	7065	6240	7420
Ideal-CT Post-Peak Slope (S)		13.638	22.266	18.082	18.724	12.662	30.039	12.932	21.787
Ideal-CT G_f/S		387.08	262.82	371.86	351.95	494.31	235.19	482.52	340.57
Displacement (mm)		2.95	3.15	3.04	2.97	3.03	3.34	3.08	3.43
Ideal-CT - CT Index		7.6	5.5	7.5	7.0	10.0	5.2	9.9	7.8

Pill Designation	RG74.7-2-2	RG74.7-2-1	RG74.7-2-3	RG74.7-2-4	RG74.7-2-5	RG74.7-2-6	RG74.7-2-7
Date Compacted							
Mix Number	24	24	24	24	24	24	24
TT Mix Code	RG7	RG7	RG7	RG7	RG7	RG7	RG7
Mix ID	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2506.8	2486.9	2470.4	2476.7	2477.5	2475.1	2474.7
Submerged Weight, g (B)	1472	1441.5	1435.9	1439.9	1443.4	1441.4	1428.3
SSD Weight, g (C)	2538.3	2501.6	2491.7	2499.6	2498.8	2495.6	2499.3
Bulk Specific Gravity, Gmb	2.351	2.346	2.340	2.337	2.347	2.348	2.311
% Water Absorbed by Volume	3.0	1.4	2.0	2.2	2.0	1.9	2.3
Theoretical Maximum Density, Gmm	2.508	2.508	2.508	2.508	2.508	2.508	2.508
% Voids in Total Mix (VTM)	**6.3**	**6.5**	**6.7**	**6.8**	**6.4**	**6.4**	**7.9**
% Compaction	93.7	93.5	93.3	93.2	93.6	93.6	92.1
Specimen Average Thickness (mm)	62.0					62.0	62.0
Performance Test	Ideal RT	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT
Date Sent	1/7/2020	12/19/2019	12/19/2019	12/19/2019	12/19/2019	1/7/2020	1/7/2020
To Whom	Cynthia	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia
Ideal-RT Load (KN)	6.218					6.53	6.749
Ideal-RT Shear Strength (MPa)	1.879	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.973	2.040
HWT Rut Depth @ 5,000 passes (mm)		1.67		1.56			
HWT Rut Depth @ 10,000 passes (mm)		1.99		1.91			
HWT Rut Depth @ 20,000 passes (mm)		2.33		2.32			
HWT Creep Slope		-2.442E-05		2.559E-06			
HWT Stripping Slope		-2.444E-05		2.539E-06			
Stripping Inflection Point (SIP)		20995		20989			
Stripping Number (LC_{SN})		>20002		>20002			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)		4.42E-07		5.51E-07			
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})		-		-			
Corrected $RD_{10,000}$		1.99		1.89			
Corrected $RD_{20,000}$		2.34		2.32			
Terminal Rut Depth (mm)		2.35		2.36			
Terminal Rut Depth (in)		0.09		0.09			
Terminal Wheel Passes (N_{max})		21000		21000			
Rutting Resistance Index (RRI)		19057		19049			
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	RG74.7-2-8	RG74.7-2-9	RG74.7-2-10	RG74.7-2-11	RG74.7-2-12	RG74.7-4-1	RG74.7-4-2
Date Compacted							
Mix Number	24	24	24	24	24	24	24
TT Mix Code	RG7	RG7	RG7	RG7	RG7	RG7	RG7
Mix ID	B2	B2	B2	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2477					2475.9	2450
Submerged Weight, g (B)	1413.8					1444.3	1427.1
SSD Weight, g (C)	2499.7					2513.6	2476
Bulk Specific Gravity, Gmb	2.281	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.315	2.336
% Water Absorbed by Volume	2.1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3.5	2.5
Theoretical Maximum Density, Gmm	2.508	2.508	2.508	2.508	2.508	2.508	2.508
% Voids in Total Mix (VTM)	**9.0**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**7.7**	**6.9**
% Compaction	91.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	92.3	93.1
Specimen Average Thickness (mm)	62.0						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/7/2020					12/19/2019	12/19/2019
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	6.078						
Ideal-RT Shear Strength (MPa)	1.837	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						10886	10958
Ideal-CT Post-Peak Slope (S)						5.02	6.68

Ideal-CT G_f/S						2170	1641
Displacement (mm)						4.70	4.53
Ideal-CT - CT Index						68	50

Pill Designation	RG74.7-4-3	RG74.7-4-4	RG74.7-4-5	RG74.7-4-6
Date Compacted				
Mix Number	24	24	24	24
TT Mix Code	RG7	RG7	RG7	RG7
Mix ID	B2	B2	B2	B2
Mix Type	BM2	BM2	BM2	BM2
Producer	Rogers Group	Rogers Group	Rogers Group	Rogers Group
TDOT JMF#	19M0019	19M0019	19M0019	19M0019
Aggregate	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22
Additive	Evotherm M1	Evotherm M1	Evotherm M1	Evotherm M1
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	4.7	4.7	4.7	4.7
Age Time	4	4	4	4
Dry Weight in Air, g (A)	2472.9	2475		
Submerged Weight, g (B)	1445.5	1443.2		
SSD Weight, g (C)	2492	2498.6		
Bulk Specific Gravity, Gmb	2.363	2.345	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.8	2.2	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.508	2.508	2.508	2.508
% Voids in Total Mix (VTM)	**5.8**	**6.5**	**#DIV/0!**	**#DIV/0!**
% Compaction	94.2	93.5	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test	Ideal CT	Ideal CT		
Date Sent	12/19/2019	12/19/2019		
To Whom	Ingevity	Ingevity		
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)	11126	10289		
Ideal-CT Post-Peak Slope (S)	6.93	6.86		

Ideal-CT G_f/S	1606	1500		
Displacement (mm)	4.17	4.20		
Ideal-CT - CT Index	45	42		

Pill Designation	SC64.8-2-1	SC64.8-2-2	SC64.8-2-3	SC64.8-2-4	SC64.8-2-6	SC64.8-2-5	SC64.8-2-7	SC64.8-2-8	SC64.8-2-9	SC64.8-2-10	SC64.8-4-1	SC64.8-4-2	SC64.8-4-3	SC64.8-4-4	SC64.8-4-	SC64.8-4-6	SC64.8-4-7	SC64.8-4-8
Date Compacted	10/29/2019	10/29/2019	10/29/2019	10/29/2019	10/29/2019	10/29/2019					10/29/2019	10/29/2019	10/29/2019	10/29/2019	11/6/201	11/6/2019	11/6/2019	11/6/2019
Mix Number	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
TT Mix Code	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6	SC6
Mix ID	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Constr	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 97	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Age Time	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4
Dry Weight in Air, g (A)	2424.3	2393.1	2415.6	2415.2	2415.6	2411.2					2415.6	2418.5	2418.2	2418.4	2379.8	2379.1	2383.2	2385.0
Submerged Weight, g (B)	1368.3	1341.1	1370.8	1352.8	1355.4	1371.7					1362.8	1366.0	1370.0	1373.9	1343.3	1353.4	1338.7	1345.4
SSD Weight, g (C)	2431.1	2408.5	2430.9	2427.2	2428.0	2426.9					2426.7	2434.2	2435.5	2435.7	2406.5	2406.3	2405.9	2403.0
Bulk Specific Gravity, Gmb	2.281	2.242	2.279	2.248	2.252	2.285	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.271	2.264	2.270	2.278	2.238	2.260	2.233	2.255
% Water Absorbed by Volume	0.6	1.4	1.4	1.1	1.2	1.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.0	1.5	1.6	1.6	2.5	2.6	2.1	1.7
Theoretical Maximum Density, Gmm	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423	2.423
% Voids in Total Mix (VTM)	5.9	7.5	6.0	7.2	7.1	5.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	6.3	6.6	6.3	6.0	7.6	6.7	7.8	6.9
% Compaction	94.1	92.5	94.0	92.8	92.9	94.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.7	93.4	93.7	94.0	92.4	93.3	92.2	93.1
Specimen Average Thickness (mm)	62.0					62.0	62.0	62.0	62.0	62.0								
Performance Test	Ideal RT	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT		Ideal CT		Ideal RT	Ideal CT	Ideal CT	Ideal RT	Ideal CT
Date Sent	1/8/2020	11/7/2019	11/7/2019	11/7/2019	11/7/2019	1/8/2020	1/8/2020	1/8/2020	1/8/2020	1/8/2020		11/7/2019		1/8/2020	11/7/201	11/7/2019	1/8/2020	11/7/2019
To Whom	Cynthia	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia	Cynthia	Cynthia		Ingevity		Cynthia	Ingevity	Ingevity	Cynthia	Ingevity
Ideal-RT Load (KN)	6.449					6.906	5.326	4.398	5.014	6.899				7.309			5.348	
Ideal-RT Shear Strength (MPa)	1.949	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.087	1.610	1.329	1.515	2.085	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)		2.17		1.87														
HWT Rut Depth @ 10,000 passes (mm)		2.56		2.23														
HWT Rut Depth @ 20,000 passes (mm)		2.89		2.61														
HWT Creep Slope		-9.32E-05		-3.58E-05														
HWT Stripping Slope		-9.32E-05		-3.59E-05														
Stripping Inflection Point (SIP)		20992		20990														
Stripping Number (LC_{SN})		>20002		>20002														
Viscoplastic Strain Increment ($\Delta\varepsilon^{ie}$)		6.97E-07		4.84E-07														
Stripping Strain (ε^{ie})																		
Stripping Life (LC_{SP})		∞		∞														
Corrected $RD_{10,000}$		2.52		2.21														
Corrected $RD_{20,000}$		3.07		2.60														
Terminal Rut Depth (mm)		2.90		2.61														
Terminal Rut Depth (in)		0.11		0.10														
Terminal Wheel Passes (N_{max})		20002		20002														
Rutting Resistance Index (RRI)		17718		17947														
Ideal-CT Fracture Energy (G_f)												8846			9188	7924		9784
Ideal-CT Post-Peak Slope (S)												9.44			4.59	6.12		6.32
Ideal-CT G_f/S												937			2001	1296		1548
Displacement (mm)												3.35			5.02	4.00		3.91
Ideal-CT - CT Index												21			67	34		40

Pill Designation	SUBS-3-2-1	SUBS-3-2-2	SUBS-3-2-3	SUBS-3-2-4	SUBS-3-2-5	SUBS-3-2-6	SUBS-3-2-7	SUBS-3-2-8	SUBS-3-2-9	SUBS-3-2-10	SUBS-3-4-1	SUBS-3-4-2	SUBS-3-4-3	SUBS-3-4-4	SUBS-3-4-5	SUBS-3-4-6	SUBS-3-4-7	SUBS-3-4-8	SUBS-3-4-9	SUBS-3-4-10	SUBS-3-4-11	SUBS-3-4-12
Date Compacted	10/29/2019	10/29/2019	10/29/2019	10/29/2019	10/29/2019	10/29/2019	11/14/2019	11/14/2019	11/14/2019	11/14/2019	10/30/2019	10/30/2019	10/30/2019	10/30/2019	11/6/2019	11/6/2019	11/6/2019	11/6/2019	11/6/2019	11/6/2019	11/6/2019	11/6/2019
Mix Number	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
TT Mix Code	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6	SU6
Mix ID	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22	PG 64-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
[illegible]																						
Age Time	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4
Dry Weight in Air, g (A)	2408.1	2382.9	2377.0	2374.0	2375.7	2374.8	2371.4	2371.6	2367.1	2372.7	2378.4	2377.1	2376.4	2375.2	2377.1	2373.6	2375.3	2372.6	2368.1	2370.8	2373.7	2369.5
Submerged Weight, g (B)	1360.7	1328.5	1325.1	1328.1	1336.6	1330.6	1345.1	1347.9	1357.1	1338.1	1350.8	1333.5	1336.7	1344.0	1331.8	1327.3	1342.5	1346.8	1325.0	1340.1	1334.0	1334.6
SSD Weight, g (C)	2424.1	2393.7	2389.6	2391.1	2395.8	2394.1	2392.7	2393.0	2387.2	2386.9	2399.4	2394.4	2394.2	2397.1	2392.7	2389.4	2399.2	2398.6	2381.3	2389.1	2391.5	2387.0
Bulk Specific Gravity, Gmb	2.265	2.237	2.235	2.233	2.243	2.233	2.264	2.269	2.298	2.262	2.268	2.241	2.246	2.255	2.241	2.235	2.248	2.256	2.243	2.260	2.245	2.252
% Water Absorbed by Volume	1.5	1.9	1.4	1.8	1.9	1.8	2.0	2.0	2.0	1.4	2.0	1.8	1.8	2.1	1.5	1.5	2.3	2.5	1.4	1.7	1.7	1.7
[illegible]																						
% Voids in Total Mix (VTM)	6.9	7.0	7.2	7.2	6.8	7.2	6.9	6.7	6.5	6.9	6.7	6.9	6.6	6.3	6.9	7.1	6.6	6.2	6.8	6.1	6.7	6.4
% Compaction	94.1	93.0	92.8	92.8	93.2	92.8	94.1	94.3	95.3	94.0	94.3	93.1	93.4	93.7	93.1	92.9	93.4	93.8	93.2	93.9	93.3	93.8
Specimen Average Thickness (mm)						tbd	tbd	tbd	tbd	tbd												
Performance Test		HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT	Ideal RT	Ideal RT		Ideal CT				Ideal CT			Ideal CT		Ideal CT	
Date Sent		11/7/2019	11/7/2019	11/7/2019	11/7/2019	1/9/2020	1/9/2020	1/9/2020	1/9/2020	1/9/2020		11/7/2019				11/7/2019			11/7/2019		11/7/2019	
To Whom		Ingevity	Ingevity	Ingevity	Ingevity	Cyntinia	Cyntinia	Cyntinia	Cyntinia	Cyntinia		Ingevity				Ingevity			Ingevity		Ingevity	
Ideal-RT Load (KN)						3.089	3.463	3.568	5.129	3.444												
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.934	1.047	1.078	1.550	1.041	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)		3.86		2.97																		
HWT Rut Depth @ 10,000 passes (mm)		4.85		3.42																		
HWT Rut Depth @ 20,000 passes (mm)		6.43		4.23																		
HWT Creep Slope		3.23E-05		-2.31E-05																		
HWT Stripping Slope		3.22E-05		-2.32E-05																		
Stripping Inflection Point (SIP)		20983		20987																		
Stripping Number (kL_{SIP})		>20002		>20002																		
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)		1.68E-06		8.55E-07																		
Stripping Strain (ε_{∞})																						
Stripping Life (LC_{SIP})		∞		∞																		
Corrected $RU_{10,000}$		4.93		3.48																		
Corrected $RU_{20,000}$		6.24		4.16																		
Terminal Rut Depth (mm)		6.43		4.22																		
Terminal Rut Depth (in)		0.25		0.17																		
Terminal Wheel Passes (N_{max})		20002		20002																		
Rutting Resistance Index (RRI)		14939		16679																		
Ideal-CT Fracture Energy (Ga)												10799				9562			9541		10065	
Ideal-CT Post-Peak Slope (S)												5.56				5.99			6.68		4.30	
Ideal-CT G/S												1941				1595			1428		2339	
Displacement (mm)												4.65				5.29			4.46		4.28	
Ideal-CT - CT Index												80				56			42		87	

Pill Designation	SC74.8-2-1	SC74.8-2-2	SC74.8-2-3	SC74.8-2-4	SC74.8-2-5	SC74.8-2-6	SC74.8-2-7
Date Compacted	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019
Mix Number	27	27	27	27	27	27	27
TT Mix Code	SC7	SC7	SC7	SC7	SC7	SC7	SC7
Mix ID	B3	B3	B3	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2380.7	2374.8	2380.4	2383.8	2381.8	2380.8	2384.3
Submerged Weight, g (B)	1347.7	1343.4	1359.1	1346.5	1354.3	1361.4	1357.6
SSD Weight, g (C)	2400.7	2402.6	2410.1	2408.9	2419.2	2418.1	2418.8
Bulk Specific Gravity, Gmb	2.261	2.242	2.265	2.244	2.237	2.253	2.247
% Water Absorbed by Volume	1.9	2.6	2.8	2.4	3.5	3.5	3.3
Theoretical Maximum Density, Gmm	2.423	2.423	2.423	2.423	2.423	2.423	2.423
% Voids in Total Mix (VTM)	6.7	7.5	6.5	7.4	7.7	7.0	7.3
% Compaction	93.3	92.5	93.5	92.6	92.3	93.0	92.7
Specimen Average Thickness (mm)						61.7	61.6
Performance Test	HWT	HWT	HWT	HWT		Ideal RT	Ideal RT
Date Sent	11/22/2019	11/22/2019	11/22/2019	11/22/2019	12/1/2019	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	LU	Cynthia	Cynthia
Ideal-RT Load (KN)						4.189	3.788
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.275	1.152
HWT Rut Depth @ 5,000 passes (mm)	2.99		2.41				
HWT Rut Depth @ 10,000 passes (mm)	3.60		2.80				
HWT Rut Depth @ 20,000 passes (mm)	4.23		3.31				
HWT Creep Slope	-2.58E-05		-7.51E-05				
HWT Stripping Slope	-2.59E-05		-7.51E-05				
Stripping Inflection Point (SIP)	20998		20996				
Stripping Number (LC_{SN})	>20002		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	8.18E-07		5.97E-07				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	∞		∞				
Corrected $RD_{10,000}$	3.58		2.82				
Corrected $RD_{20,000}$	4.24		3.30				
Terminal Rut Depth (mm)	4.23		3.31				
Terminal Rut Depth (in)	0.17		0.13				
Terminal Wheel Passes (N_{max})	20002		20002				
Rutting Resistance Index (RRI)	16671		17395				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	SC74.8-2-8	SC74.8-2-9	SC74.8-2-10	SC74.8-4-1	SC74.8-4-2	SC74.8-4-3	SC74.8-4-4
Date Compacted	11/15/2019			11/15/2019	11/15/2019	11/15/2019	11/15/2019
Mix Number	27	27	27	27	27	27	27
TT Mix Code	SC7	SC7	SC7	SC7	SC7	SC7	SC7
Mix ID	B3	B3	B3	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Age Time	2	2	2	4	4	4	4
Dry Weight in Air, g (A)	2384.5			2380.6	2384.7	2366.3	2384.9
Submerged Weight, g (B)	1368.8			1362.7	1351.9	1351.8	1364.4
SSD Weight, g (C)	2421.4			2415.5	2412.9	2399.9	2421.5
Bulk Specific Gravity, Gmb	2.265	#DIV/0!	#DIV/0!	2.261	2.248	2.258	2.256
% Water Absorbed by Volume	3.5	#DIV/0!	#DIV/0!	3.3	2.7	3.2	3.5
Theoretical Maximum Density, Gmm	2.423	2.423	2.423	2.423	2.423	2.423	2.423
% Voids in Total Mix (VTM)	6.5	#DIV/0!	#DIV/0!	6.7	7.2	6.8	6.9
% Compaction	93.5	#DIV/0!	#DIV/0!	93.3	92.8	93.2	93.1
Specimen Average Thickness (mm)	61.5						
Performance Test	Ideal RT			Ideal CT	Ideal CT	Ideal CT	Ideal CT
Date Sent	1/8/2020			11/22/2019	11/22/2019	11/22/2019	11/22/2019
To Whom	Cynthia			Ingevity	Ingevity	Ingevity	Ingevity
Ideal-RT Load (KN)	4.364						
Ideal-RT Shear Strength (MPa)	1.329	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)				8537	6562	9480	8067
Ideal-CT Post-Peak Slope (S)				5.36	4.54	5.36	5.75

Ideal-CT G_f/S				1593	1446	1768	1403
Displacement (mm)				4.04	3.43	4.81	3.88
Ideal-CT - CT Index				43	33	57	36

Pill Designation	SC74.8-4-5	SC74.8-4-6	SC74.8-4-7	SC74.8-4-8
Date Compacted				
Mix Number	27	27	27	27
TT Mix Code	SC7	SC7	SC7	SC7
Mix ID	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50
Asphalt Content	4.8	4.8	4.8	4.8
Age Time	4	4	4	4
Dry Weight in Air, g (A)				
Submerged Weight, g (B)				
SSD Weight, g (C)				
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.423	2.423	2.423	2.423
% Voids in Total Mix (VTM)	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)				
Performance Test				
Date Sent				
To Whom				
Ideal-RT Load (KN)				
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)				
HWT Rut Depth @ 10,000 passes (mm)				
HWT Rut Depth @ 20,000 passes (mm)				
HWT Creep Slope				
HWT Stripping Slope				
Stripping Inflection Point (SIP)				
Stripping Number (LC_{SN})				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				
Stripping Strain (ε^{vt})				
Stripping Life (LC_{ST})				
Corrected $RD_{10,000}$				
Corrected $RD_{20,000}$				
Terminal Rut Depth (mm)				
Terminal Rut Depth (in)				
Terminal Wheel Passes (N_{max})				
Rutting Resistance Index (RRI)				
Ideal-CT Fracture Energy (G_f)				
Ideal-CT Post-Peak Slope (S)				

Ideal-CT G_f/S				
Displacement (mm)				
Ideal-CT - CT Index				

Pill Designation	SC75.3-2-1	SC75.3-2-2	SC75.3-2-3	SC75.3-2-4	SC75.3-2-5	SC75.3-2-6	SC75.3-2-7
Date Compacted	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019
Mix Number	28	28	28	28	28	28	28
TT Mix Code	SC7	SC7	SC7	SC7	SC7	SC7	SC7
Mix ID	B3	B3	B3	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2386.8	2386.5	2360.7	2358.7	2360.0	2357.2	2360.9
Submerged Weight, g (B)	1359.1	1357.8	1337.0	1326.7	1339.2	1339.8	1348.3
SSD Weight, g (C)	2417.1	2409.5	2382.6	2382.2	2396.2	2387.5	2393.8
Bulk Specific Gravity, Gmb	2.256	2.269	2.258	2.235	2.233	2.250	2.258
% Water Absorbed by Volume	2.9	2.2	2.1	2.2	3.4	2.9	3.1
Theoretical Maximum Density, Gmm	2.406	2.406	2.406	2.406	2.406	2.406	2.406
% Voids in Total Mix (VTM)	6.2	5.7	6.2	7.1	7.2	6.5	6.1
% Compaction	93.8	94.3	93.8	92.9	92.8	93.5	93.9
Specimen Average Thickness (mm)						61.6	
Performance Test				HWT	HWT	Ideal RT	
Date Sent	12/1/2019	12/1/2019	12/1/2019			1/8/2020	12/1/2019
To Whom	LU	LU	LU			Cynthia	LU
Ideal-RT Load (KN)						4.189	
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.275	#DIV/0!
Total Rut Depth @ 5,000 passes (mm)				2.54			
Total Rut Depth @ 10,000 passes (mm)				3.03			
Total Rut Depth @ 20,000 passes (mm)				3.65			
HWT Creep Slope				-4.666E-05			
HWT Stripping Slope				-4.672E-05			
Stripping Inflection Point (SIP)				20994			
Stripping Number (LC_{SN})				>20002			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)				7.85E-07			
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})				∞			
Corrected $RD_{10,000}$				3.05			
Corrected $RD_{20,000}$				3.68			
Terminal Rut Depth (mm)				3.66			
Terminal Rut Depth (in)				0.14			
Terminal Wheel Passes (N_{max})				20002			
Rutting Resistance Index (RRI)				17120			
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	SC75.3-2-8	SC75.3-2-9	SC75.3-4-10	SC75.3-4-12	SC75.3-4-13	SC75.3-4-14	SC75.3-4-17
Date Compacted	11/15/2019						
Mix Number	28	28	28	28	28	28	28
TT Mix Code	SC7	SC7	SC7	SC7	SC7	SC7	SC7
Mix ID	B3	B3	B3	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2357.8	2358.1	2350.1	2346.1	2356.0	2354.0	2361.3
Submerged Weight, g (B)	1340.8	1327.6	1322.9	1312.9	1320.2	1311.3	1325.3
SSD Weight, g (C)	2387.1	2388.6	2382.4	2378.2	2386.2	2375.7	2393.5
Bulk Specific Gravity, Gmb	2.253	2.223	2.218	2.202	2.210	2.212	2.211
% Water Absorbed by Volume	2.8	2.9	3.0	3.0	2.8	2.0	3.0
Theoretical Maximum Density, Gmm	2.406	2.406	2.406	2.406	2.406	2.406	2.406
% Voids in Total Mix (VTM)	6.3	7.6	7.8	8.5	8.1	8.1	8.1
% Compaction	93.7	92.4	92.2	91.5	91.9	91.9	91.9
Specimen Average Thickness (mm)		62.0	62.0	62.0	62.0	62.0	62.0
Performance Test		Ideal RT	Ideal RT	Ideal RT	Ideal RT	HWT	HWT
Date Sent	12/1/2019	1/8/2020	1/8/2020	1/8/2020	1/8/2020		
To Whom	LU	Cynthia	Cynthia	Cynthia	Cynthia		
Ideal-RT Load (KN)		2.534	2.364	2.928	3.370		
Ideal-RT Shear Strength (MPa)	#DIV/0!	0.766	0.714	0.885	1.018		
Total Rut Depth @ 5,000 passes (mm)							2.47
Total Rut Depth @ 10,000 passes (mm)							3.01
Total Rut Depth @ 20,000 passes (mm)							3.78
HWT Creep Slope							-1.595E-05
HWT Stripping Slope							-1.599E-05
Stripping Inflection Point (SIP)							20994
Stripping Number (LC_{SN})							>20000
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							7.75E-07
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							∞
Corrected $RD_{10,000}$							3.08
Corrected $RD_{20,000}$							3.69
Terminal Rut Depth (mm)							3.79
Terminal Rut Depth (in)							0.15
Terminal Wheel Passes (N_{max})							20002
Rutting Resistance Index (RRI)							17017
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	SC75.3-4-15	SC75.3-4-16	SC75.3-4-1	SC75.3-4-2	SC75.3-4-3	SC75.3-4-4	SC75.3-4-5
Date Compacted			11/15/2019	11/15/2019	11/15/2019	11/15/2019	
Mix Number	28	28	28	28	28	28	28
TT Mix Code	SC7	SC7	SC7	SC7	SC7	SC7	SC7
Mix ID	B3	B3	B3	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Age Time	2	2	4	4	4	4	4
Dry Weight in Air, g (A)	2359.7	2360.5	2388.4	2395.6	2388.8	2359.9	2361.8
Submerged Weight, g (B)	1315.2	1315.3	1359.9	1370.4	1370.6	1341.2	1329.6
SSD Weight, g (C)	2379.9	2391.0	2409.6	2421.8	2420.1	2398.3	2391.6
Bulk Specific Gravity, Gmb	2.216	2.194	2.275	2.278	2.276	2.232	2.224
% Water Absorbed by Volume	1.9	2.8	2.0	2.5	3.0	3.6	2.8
Theoretical Maximum Density, Gmm	2.406	2.406	2.406	2.406	2.406	2.406	2.406
% Voids in Total Mix (VTM)	**7.9**	**8.8**	**5.4**	**5.3**	**5.4**	**7.2**	**7.6**
% Compaction	92.1	91.2	94.6	94.7	94.6	92.8	92.4
Specimen Average Thickness (mm)	62.0	62.0					
Performance Test	Ideal RT	Ideal RT				Ideal CT	Ideal CT
Date Sent			12/1/2019	12/1/2019	12/1/2019	1/8/2020	1/8/2020
To Whom			LU	LU	LU	Ingevity	Ingevity
Ideal-RT Load (KN)	4.427	3.964					
Ideal-RT Shear Strength (MPa)	1.338	1.198	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Rut Depth @ 5,000 passes (mm)							
Total Rut Depth @ 10,000 passes (mm)							
Total Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						6185	7936
Ideal-CT Post-Peak Slope (S)						3.52	2.35

Ideal-CT G_f/S						1756	3373
Displacement (mm)						3.87	5.46
Ideal-CT - CT Index						45	123

Pill Designation	SC75.3-4-6	SC75.3-4-7	SC75.3-4-8	SC75.3-4-9	SC75.3-4-10	SC75.3-4-11	SC75.3-4-12
Date Compacted							
Mix Number	28	28	28	28	28	28	28
TT Mix Code	SC7	SC7	SC7	SC7	SC7	SC7	SC7
Mix ID	B3	B3	B3	B3	B3	B3	B3
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction	Standard Construction
TDOT JMF#	4190152	4190152	4190152	4190152	4190152	4190152	4190152
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975	NovaGrip 975
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Age Time	4	4	4	4	4	4	4
Dry Weight in Air, g (A)	2360.1	2357.8	2357.8		2350.1	2346.1	2356.0
Submerged Weight, g (B)	1327.5	1325.7	1327.1		1322.9	1312.9	1320.2
SSD Weight, g (C)	2382.5	2388.5	2383.1		2382.4	2378.2	2386.2
Bulk Specific Gravity, Gmb	2.237	2.218	2.233	#DIV/0!	2.218	2.202	2.210
% Water Absorbed by Volume	2.1	2.9	2.4	#DIV/0!	3.0	3.0	2.8
Theoretical Maximum Density, Gmm	2.406	2.406	2.406	2.406	2.406	2.406	2.406
% Voids in Total Mix (VTM)	7.0	7.8	7.2	#DIV/0!	7.8	8.5	8.1
% Compaction	93.0	92.2	92.8	#DIV/0!	92.2	91.5	91.9
Specimen Average Thickness (mm)							
Performance Test	Ideal CT	Ideal CT					
Date Sent	1/8/2020	1/8/2020					
To Whom	Ingevity	Ingevity					
Ideal-RT Load (KN)							
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Total Rut Depth @ 5,000 passes (mm)							
Total Rut Depth @ 10,000 passes (mm)							
Total Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)	8188	8417					
Ideal-CT Post-Peak Slope (S)	2.45	3.37					

Ideal-CT G_f/S	3345	2497					
Displacement (mm)	5.16	5.13					
Ideal-CT - CT Index	115	85					

Pill Designation	ST64.5-2-1	ST64.5-2-2	ST64.5-2-3	ST64.5-2-4	ST64.5-2-5	ST64.5-2-6	ST64.5-2-7	ST64.5-2-8	ST64.5-2-9
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	29	29	29	29	29	29	29	29	29
TT Mix Code	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Age Time	2	2	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2485.5	2482.8	2482.0	2483.9	2480.5	2483.6	2492.9	2492.0	
Submerged Weight, g (B)	1449.3	1441.3	1448.2	1442.9	1427.3	1451.4	1438.7	1432.8	
SSD Weight, g (C)	2502.7	2500.1	2501.9	2497.3	2493.4	2498.1	2502.5	2502.0	
Bulk Specific Gravity, Gmb	2.360	2.345	2.356	2.356	2.327	2.373	2.343	2.331	#DIV/0!
% Water Absorbed by Volume	1.6	1.6	1.9	1.3	1.2	1.4	0.9	0.9	#DIV/0!
Theoretical Maximum Density, Gmm	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
% Voids in Total Mix (VTM)	**5.6**	**6.2**	**5.8**	**5.8**	**6.9**	**5.1**	**6.3**	**6.8**	**#DIV/0!**
% Compaction	94.4	93.8	94.2	94.2	93.1	94.9	93.7	93.2	#DIV/0!
Specimen Average Thickness (mm)					62.0	62.0			
Performance Test	HWT	HWT	HWT	HWT	Ideal-RT	Ideal-RT			
Date Sent	2/25/2020	2/25/2020	2/25/2020	2/25/2020					
To Whom	Ingevity	Ingevity	Ingevity	Ingevity					
Ideal-RT Load (KN)					4.059	4.472			
Ideal-RT Shear Strength (MPa)					1.227	1.351			
HWT Rut Depth @ 5,000 passes (mm)	3.06		3.26						
HWT Rut Depth @ 10,000 passes (mm)	3.76		3.81						
HWT Rut Depth @ 20,000 passes (mm)	6.30		4.60						
HWT Creep Slope	8.994E-05		-5.144E-05						
HWT Stripping Slope	5.278E-04		-5.151E-05						
Stripping Inflection Point (SIP)	16193		20990						
Stripping Number (LC_{SN})	0		>20002						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	-		8.91E-07						
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})	24167		-						
Corrected $RD_{10,000}$	3.82		3.82						
Corrected $RD_{20,000}$	4.54		4.54						
Terminal Rut Depth (mm)	6.32		4.60						
Terminal Rut Depth (in)	0.25		0.18						
Terminal Wheel Passes (N_{max})	20002		20002						
Rutting Resistance Index (RRI)	15025		16380						
Ideal-CT Fracture Energy (G_f)									
Ideal-CT Post-Peak Slope (S)									
Ideal-CT G_f/S									
Displacement (mm)									
Ideal-CT - CT Index									
Initial Dry Mass, g	2488.8	2486.5	2486.2	2486.2	2483.8	2487.6			
Mass of Dry, Sealed Specimen, g	2513	2510.5	2510.6	2510.6	2508	2511.9			
Mass of Sealed Specimen Submergered, g	1402	1401	1403.1	1400.4	1393.6	1406.3			
Final Mass Removed From Bag, g	2488.9	2486.8	2486.3	2486.3	2483.7	2487.6			
Apparent Specific Gravity of Bag***	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121
Bulk Specific Gravity	2.302	2.302	2.307	2.301	2.290	2.313	#DIV/0!	#DIV/0!	#DIV/0!
Max Apparent Specific Gravity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Air Voids, %	**7.9**	**7.9**	**7.7**	**7.9**	**8.4**	**7.5**	#DIV/0!	#DIV/0!	#DIV/0!
Density	92.1	92.1	92.3	92.1	91.6	92.5	#DIV/0!	#DIV/0!	#DIV/0!

Pill Designation	ST64.5-2-10	ST64.5-2-12	ST64.5-2-13	ST64.5-2-61	ST64.5-2-62	ST64.5-4-1	ST64.5-4-2	ST64.5-4-3	ST64.5-4-4
Date Compacted	2/10/2020	2/10/2020	2/10/2020	12/30/2020	12/30/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	29	29	29	29	29	29	29	29	29
TT Mix Code	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	PaveBond Lite	PaveBond Lite	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Age Time	2	2	2	2	2	4	4	4	4
Dry Weight in Air, g (A)				2474.2	2472.5	2482.8	2480.5	2485.6	2482.5
Submerged Weight, g (B)				1425.0	1418.8	1447.0	1445.0	1448.4	1443.7
SSD Weight, g (C)				2484.8	2484.6	2496.8	2504.2	2503.2	2492.8
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	2.335	2.320	2.365	2.342	2.356	2.366
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	1.0	1.1	1.3	2.2	1.7	1.0
Theoretical Maximum Density, Gmm	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	6.6	7.2	5.4	6.3	5.7	5.3
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	93.4	92.8	94.6	93.7	94.3	94.7
Specimen Average Thickness (mm)				62.0	62.0				
Performance Test				Ideal-RT	Ideal-RT				
Date Sent									
To Whom									
Ideal-RT Load (KN)				2.061	1.814				
Ideal-RT Shear Strength (MPa)				0.623	0.548				
HWT Rut Depth @ 5,000 passes (mm)									
HWT Rut Depth @ 10,000 passes (mm)									
HWT Rut Depth @ 20,000 passes (mm)									
HWT Creep Slope									
HWT Stripping Slope									
Stripping Inflection Point (SIP)									
Stripping Number (LC_{SN})									
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})									
Corrected $RD_{10,000}$									
Corrected $RD_{20,000}$									
Terminal Rut Depth (mm)									
Terminal Rut Depth (in)									
Terminal Wheel Passes (N_{max})									
Rutting Resistance Index (RRI)									
Ideal-CT Fracture Energy (G_f)						10647	9533	10512	9217
Ideal-CT Post-Peak Slope (S)						2.20	2.15	2.87	2.12
Ideal-CT G_f/S						4840	4425	3612	4342
Displacement (mm)						5.32	5.98	6.09	5.42
Ideal-CT - CT Index						172	176	228	157
Initial Dry Mass, g									
Mass of Dry, Sealed Specimen, g									
Mass of Sealed Specimen Submergered, g									
Final Mass Removed From Bag, g									
Apparent Specific Gravity of Bag***	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121
Bulk Specific Gravity	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Max Apparent Specific Gravity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Air Voids, %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Density	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Pill Designation	ST64.5-4-5	ST64.5-4-6	ST64.5-4-7	ST64.5-4-8	ST64.5-4-9	ST64.5-4-10	ST64.5-4-11	ST64.5-4-12
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	29	29	29	29	29	29	29	29
TT Mix Code	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Age Time	4	4	4	4	4	4	4	4
Dry Weight in Air, g (A)								
Submerged Weight, g (B)								
SSD Weight, g (C)								
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	1.0	0.9	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.500	2.500	2.500	2.500	2.500	2.500	2.500	2.500
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)								
Performance Test								
Date Sent								
To Whom								
Ideal-RT Load (KN)								
Ideal-RT Shear Strength (MPa)								
HWT Rut Depth @ 5,000 passes (mm)								
HWT Rut Depth @ 10,000 passes (mm)								
HWT Rut Depth @ 20,000 passes (mm)								
HWT Creep Slope								
HWT Stripping Slope								
Stripping Inflection Point (SIP)								
Stripping Number (LC_{SN})								
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)								
Stripping Strain (ε^{vt})								
Stripping Life (LC_{ST})								
Corrected $RD_{10,000}$								
Corrected $RD_{20,000}$								
Terminal Rut Depth (mm)								
Terminal Rut Depth (in)								
Terminal Wheel Passes (N_{max})								
Rutting Resistance Index (RRI)								
Ideal-CT Fracture Energy (G_f)								
Ideal-CT Post-Peak Slope (S)								
Ideal-CT G_f/S								
Displacement (mm)								
Ideal-CT - CT Index								
Initial Dry Mass, g								
Mass of Dry, Sealed Specimen, g								
Mass of Sealed Specimen Submergered, g								
Final Mass Removed From Bag, g								
Apparent Specific Gravity of Bag***	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121
Bulk Specific Gravity	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Max Apparent Specific Gravity	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Air Voids, %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Density	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Pill Designation	ST65.0-2-1	ST65.0-2-2	ST65.0-2-3	ST65.0-2-4	ST65.0-2-5	ST65.0-2-6	ST65.0-2-7	ST65.0-2-8	ST65.0-2-9
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	30	30	30	30	30	30	30	30	30
TT Mix Code	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Age Time	2	2	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2462.2	2466.6	2463.9	2463.5	2466.3	2462.3	2470.1	2474.0	
Submerged Weight, g (B)	1418.3	1418.7	1434.0	1437.6	1410.6	1420.6	1424.1	1422.6	
SSD Weight, g (C)	2472.4	2475.8	2478.4	2477.7	2477.5	2478.2	2483.9	2483.0	
Bulk Specific Gravity, Gmb	2.336	2.333	2.359	2.369	2.312	2.328	2.331	2.333	#DIV/0!
% Water Absorbed by Volume	1.0	0.9	1.4	1.4	1.0	1.5	1.3	0.8	#DIV/0!
Theoretical Maximum Density, Gmm	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482
% Voids in Total Mix (VTM)	**5.9**	**6.0**	**4.9**	**4.6**	**6.9**	**6.2**	**6.1**	**6.0**	**#DIV/0!**
% Compaction	94.1	94.0	95.1	95.4	93.1	93.8	93.9	94.0	#DIV/0!
Specimen Average Thickness (mm)					62.0	62.0			
Performance Test	HWT	HWT	HWT	HWT	Ideal-RT	Ideal-RT			
Date Sent	2/25/2020	2/25/2020	2/25/2020	2/25/2020					
To Whom	Ingevity	Ingevity	Ingevity	Ingevity					
Ideal-RT Load (KN)					3.740	4.063			
Ideal-RT Shear Strength (MPa)					1.130	1.228			
HWT Rut Depth @ 5,000 passes (mm)	3.34		5.91						
HWT Rut Depth @ 10,000 passes (mm)	3.99		7.66						
HWT Rut Depth @ 20,000 passes (mm)	5.29		13.15						
HWT Creep Slope	-5.621E-05		0.0002686						
HWT Stripping Slope	-5.63E-05		0.0002685						
Stripping Inflection Point (SIP)	20993		20993						
Stripping Number (LC_{SN})	>20002		0						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.23E-06		-						
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})	-		31237						
Corrected $RD_{10,000}$	4.14		4.14						
Corrected $RD_{20,000}$	5.11		5.11						
Terminal Rut Depth (mm)	5.28		13.13						
Terminal Rut Depth (in)	0.21		0.52						
Terminal Wheel Passes (N_{max})	20002		20002						
Rutting Resistance Index (RRI)	15844		9662						
Ideal-CT Fracture Energy (G_f)									
Ideal-CT Post-Peak Slope (S)									
Ideal-CT G_f/S									
Displacement (mm)									
Ideal-CT - CT Index									
Initial Dry Mass, g	2463.5	2467.6	2467	2465.5	2468.5	2465.4			
Mass of Dry, Sealed Specimen, g	2487.6	2491.7	2491.7	2489.8	2492.5	2490			
Mass of Sealed Specimen Submergered, g	1379.2	1379.3	1387	1389.1	1376.1	1379			
Final Mass Removed From Bag, g	2463.5	2467.6	2467.1	2465.5	2468.4	2465.5			
Apparent Specific Gravity of Bag***	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121			
Bulk Specific Gravity	2.284	2.279	2.296	2.303	2.271	2.281			
Max Apparent Specific Gravity	2.482	2.482	2.482	2.482	2.482	2.482			

Air Voids, %	**8.0**	**8.2**	**7.5**	**7.2**	**8.5**	**8.1**			
Density	92.0	91.8	92.5	92.8	91.5	91.9			

Pill Designation	ST65.0-4-10	ST65.0-4-12	ST65.0-4-13	ST65.0-4-1	ST65.0-4-2	ST65.0-4-3	ST65.0-4-4	ST65.0-4-5	ST65.0-4-6
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	30	30	30	30	30	30	30	30	30
TT Mix Code	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6	ST6
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Age Time	2	2	2	4	4	4	4	4	4
Dry Weight in Air, g (A)				2460.9	2463.9	2460.7	2468.4		
Submerged Weight, g (B)				1424.3	1438.3	1433.3	1429.1		
SSD Weight, g (C)				2475.5	2482.4	2473.4	2483.0		
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	2.341	2.360	2.366	2.342	#DIV/0!	2.336
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	1.4	1.8	1.2	1.4	#DIV/0!	1.0
Theoretical Maximum Density, Gmm	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	5.7	4.9	4.7	5.6	#DIV/0!	5.9
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	94.3	95.1	95.3	94.4	#DIV/0!	94.1
Specimen Average Thickness (mm)									
Performance Test									
Date Sent									
To Whom									
Ideal-RT Load (KN)									
Ideal-RT Shear Strength (MPa)									
HWT Rut Depth @ 5,000 passes (mm)									
HWT Rut Depth @ 10,000 passes (mm)									
HWT Rut Depth @ 20,000 passes (mm)									
HWT Creep Slope									
HWT Stripping Slope									
Stripping Inflection Point (SIP)									
Stripping Number (LC_{SN})									
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})									
Corrected $RD_{10,000}$									
Corrected $RD_{20,000}$									
Terminal Rut Depth (mm)									
Terminal Rut Depth (in)									
Terminal Wheel Passes (N_{max})									
Rutting Resistance Index (RRI)									
Ideal-CT Fracture Energy (G_f)				10682	10596	11809	11099		
Ideal-CT Post-Peak Slope (S)				2.49	1.56	1.51	3.41		
Ideal-CT G_f/S				4282	6814	7825	3250		
Displacement (mm)				5.86	7.25	7.18	6.26		
Ideal-CT - CT Index				167	327	375	136		
Initial Dry Mass, g									
Mass of Dry, Sealed Specimen, g									
Mass of Sealed Specimen Submergered, g									
Final Mass Removed From Bag, g									
Apparent Specific Gravity of Bag***									
Bulk Specific Gravity									
Max Apparent Specific Gravity									

Air Voids, %									
Density									

Pill Designation	ST65.0-4-7	ST65.0-4-8	ST65.0-4-9	ST65.0-4-10	ST65.0-4-11	ST65.0-4-12
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	30	30	30	30	30	30
TT Mix Code	ST6	ST6	ST6	ST6	ST6	ST6
Mix ID	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.0	5.0	5.0	5.0	5.0	5.0
Age Time	4	4	4	4	4	4
Dry Weight in Air, g (A)						
Submerged Weight, g (B)						
SSD Weight, g (C)						
Bulk Specific Gravity, Gmb	2.333	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	0.9	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.482	2.482	2.482	2.482	2.482	2.482
% Voids in Total Mix (VTM)	6.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Compaction	94.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)						
Performance Test						
Date Sent						
To Whom						
Ideal-RT Load (KN)						
Ideal-RT Shear Strength (MPa)						
HWT Rut Depth @ 5,000 passes (mm)						
HWT Rut Depth @ 10,000 passes (mm)						
HWT Rut Depth @ 20,000 passes (mm)						
HWT Creep Slope						
HWT Stripping Slope						
Stripping Inflection Point (SIP)						
Stripping Number (LC_{SN})						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})						
Corrected $RD_{10,000}$						
Corrected $RD_{20,000}$						
Terminal Rut Depth (mm)						
Terminal Rut Depth (in)						
Terminal Wheel Passes (N_{max})						
Rutting Resistance Index (RRI)						
Ideal-CT Fracture Energy (G_f)						
Ideal-CT Post-Peak Slope (S)						
Ideal-CT G_f/S						
Displacement (mm)						
Ideal-CT - CT Index						
Initial Dry Mass, g						
Mass of Dry, Sealed Specimen, g						
Mass of Sealed Specimen Submergered, g						
Final Mass Removed From Bag, g						
Apparent Specific Gravity of Bag***						
Bulk Specific Gravity						
Max Apparent Specific Gravity						

Air Voids, %						
Density						

Pill Designation	ST74.5-2-1	ST74.5-2-2	ST74.5-2-3	ST74.5-2-4	ST74.5-2-5	ST74.5-2-6	ST74.5-2-7	ST74.5-2-8	ST74.5-2-9
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	31	31	31	31	31	31	31	31	31
TT Mix Code	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Age Time	2	2	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2482.7	2511.9	2482.0	2484.6	2483.3	2482.7	2489.2	2494.7	
Submerged Weight, g (B)	1441.8	1462.8	1438.6	1444.1	1455.2	1459.1	1466.4	1469.0	
SSD Weight, g (C)	2496.8	2522.8	2494.3	2500.3	2506.6	2502.8	2503.8	2516.2	
Bulk Specific Gravity, Gmb	2.353	2.370	2.351	2.352	2.362	2.379	2.399	2.382	#DIV/0!
% Water Absorbed by Volume	1.3	1.0	1.2	1.5	2.2	1.9	1.4	2.1	#DIV/0!
Theoretical Maximum Density, Gmm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
% Voids in Total Mix (VTM)	**5.9**	**5.2**	**6.0**	**5.9**	**5.5**	**4.9**	**4.0**	**4.7**	**#DIV/0!**
% Compaction	94.1	94.8	94.0	94.1	94.5	95.1	96.0	95.3	#DIV/0!
Specimen Average Thickness (mm)						62.0			
Performance Test	HWT	HWT	HWT	HWT		Ideal-RT			
Date Sent	2/25/2020	2/25/2020	2/25/2020	2/25/2020					
To Whom	Ingevity	Ingevity	Ingevity	Ingevity					
Ideal-RT Load (KN)						5.165			
Ideal-RT Shear Strength (MPa)						1.561			
HWT Rut Depth @ 5,000 passes (mm)	1.65		1.39						
HWT Rut Depth @ 10,000 passes (mm)	2.01		1.60						
HWT Rut Depth @ 20,000 passes (mm)	2.52		1.83						
HWT Creep Slope	-1.273E-05		-1.902E-05						
HWT Stripping Slope	-1.276E-05		-1.904E-05						
Stripping Inflection Point (SIP)	20993		20996						
Stripping Number (LC_{SN})	0		>20002						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	-		3.86E-07						
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})	249798		-						
Corrected $RD_{10,000}$	1.58		1.58						
Corrected $RD_{20,000}$	1.89		1.89						
Terminal Rut Depth (mm)	2.51		1.83						
Terminal Rut Depth (in)	0.10		0.07						
Terminal Wheel Passes (N_{max})	20002		20002						
Rutting Resistance Index (RRI)	18025		18561						
Ideal-CT Fracture Energy (G_f)									
Ideal-CT Post-Peak Slope (S)									
Ideal-CT G_f/S									
Displacement (mm)									
Ideal-CT - CT Index									
Initial Dry Mass, g	2485.4	2513.1	2483.3	2487.3	2488.5	2485.8			
Mass of Dry, Sealed Specimen, g	2509.9	2537.7	2507.7	2511.7	2515.4	2513			
Mass of Sealed Specimen Submergered, g	1402.6	1408.3	1399.1	1345	1400.4	1407.4			
Final Mass Removed From Bag, g	2485.7	2513.3	2483.6	2487.5	2488.1	2485.7			
Apparent Specific Gravity of Bag***	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121			
Bulk Specific Gravity	2.307	2.286	2.302	2.188	2.301	2.319			
Max Apparent Specific Gravity	2.5	2.5	2.5	2.5	2.5	2.5			

Air Voids, %	**7.7**	**8.6**	**7.9**	**12.5**	**8.0**	**7.2**			
Density	92.3	91.4	92.1	87.5	92.0	92.8			

Pill Designation	ST74.5-2-10	ST74.5-2-12	ST74.5-2-13	ST74.5-2-71	ST74.5-2-72	ST74.5-4-1	ST74.5-4-2	ST74.5-4-3	ST74.5-4-4
Date Compacted	2/10/2020	2/10/2020	2/10/2020	12/30/2020	12/30/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	31	31	31	31	31	31	31	31	31
TT Mix Code	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	PaveBond Lite	PaveBond Lite	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Age Time	2	2	2	2	2	4	4	4	4
Dry Weight in Air, g (A)				2473.4	2474.3	2482.4	2487.5	2480.1	2483.2
Submerged Weight, g (B)				1438.8	1440.8	1439.0	1452.7	1461.8	1462.3
SSD Weight, g (C)				2485.0	2493.0	2499.1	2521.9	2496.8	2508.6
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	2.364	2.352	2.342	2.327	2.396	2.373
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	1.1	1.8	1.6	3.2	1.6	2.4
Theoretical Maximum Density, Gmm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	5.4	5.9	6.3	6.9	4.2	5.1
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	94.6	94.1	93.7	93.1	95.8	94.9
Specimen Average Thickness (mm)				62.0	62.0				
Performance Test				Ideal-RT	Ideal-RT				
Date Sent									
To Whom									
Ideal-RT Load (KN)				3.005	2.967				
Ideal-RT Shear Strength (MPa)				0.908	0.897				
HWT Rut Depth @ 5,000 passes (mm)									
HWT Rut Depth @ 10,000 passes (mm)									
HWT Rut Depth @ 20,000 passes (mm)									
HWT Creep Slope									
HWT Stripping Slope									
Stripping Inflection Point (SIP)									
Stripping Number (LC_{SN})									
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})									
Corrected $RD_{10,000}$									
Corrected $RD_{20,000}$									
Terminal Rut Depth (mm)									
Terminal Rut Depth (in)									
Terminal Wheel Passes (N_{max})									
Rutting Resistance Index (RRI)									
Ideal-CT Fracture Energy (G_f)						13666	10817	10549	10034
Ideal-CT Post-Peak Slope (S)						4.45	6.05	2.95	2.75
Ideal-CT G_f/S						3072	1787	3572	3655
Displacement (mm)						5.18	4.93	4.76	4.91
Ideal-CT - CT Index						106	59	113	120
Initial Dry Mass, g									
Mass of Dry, Sealed Specimen, g									
Mass of Sealed Specimen Submergered, g									
Final Mass Removed From Bag, g									
Apparent Specific Gravity of Bag***									
Bulk Specific Gravity									
Max Apparent Specific Gravity									

Air Voids, %									
Density									

Pill Designation	ST74.5-4-5	ST74.5-4-6	ST74.5-4-7	ST74.5-4-8	ST74.5-4-9	ST74.5-4-10	ST74.5-4-11	ST74.5-4-12
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	31	31	31	31	31	31	31	31
TT Mix Code	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Age Time	4	4	4	4	4	4	4	4
Dry Weight in Air, g (A)								
Submerged Weight, g (B)								
SSD Weight, g (C)								
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)								
Performance Test								
Date Sent								
To Whom								
Ideal-RT Load (KN)								
Ideal-RT Shear Strength (MPa)								
HWT Rut Depth @ 5,000 passes (mm)								
HWT Rut Depth @ 10,000 passes (mm)								
HWT Rut Depth @ 20,000 passes (mm)								
HWT Creep Slope								
HWT Stripping Slope								
Stripping Inflection Point (SIP)								
Stripping Number (LC_{SN})								
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)								
Stripping Strain (ε^{vt})								
Stripping Life (LC_{ST})								
Corrected $RD_{10,000}$								
Corrected $RD_{20,000}$								
Terminal Rut Depth (mm)								
Terminal Rut Depth (in)								
Terminal Wheel Passes (N_{max})								
Rutting Resistance Index (RRI)								
Ideal-CT Fracture Energy (G_f)								
Ideal-CT Post-Peak Slope (S)								
Ideal-CT G_f/S								
Displacement (mm)								
Ideal-CT - CT Index								
Initial Dry Mass, g								
Mass of Dry, Sealed Specimen, g								
Mass of Sealed Specimen Submergered, g								
Final Mass Removed From Bag, g								
Apparent Specific Gravity of Bag***								
Bulk Specific Gravity								
Max Apparent Specific Gravity								

Air Voids, %								
Density								

Pill Designation	ST75.0-2-1	ST75.0-2-2	ST75.0-2-3	ST75.0-2-4	ST75.0-2-5	ST75.0-2-6	ST75.0-2-7	ST75.0-2-8	ST75.0-2-9
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	32	32	32	32	32	32	32	32	32
TT Mix Code	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5	5	5	5	5	5	5	5	5
Age Time	2	2	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2466.5	2464.8	2462.5	2464.7	2462.9	2463.2	2474.0	2470.5	
Submerged Weight, g (B)	1432.2	1433.6	1431.6	1424.7	1442.0	1436.0	1441.7	1447.6	
SSD Weight, g (C)	2482.9	2483.2	2476.5	2474.8	2480.6	2477.9	2488.6	2491.6	
Bulk Specific Gravity, Gmb	2.347	2.348	2.357	2.347	2.371	2.364	2.363	2.366	#DIV/0!
% Water Absorbed by Volume	1.6	1.8	1.3	1.0	1.7	1.4	1.4	2.0	#DIV/0!
Theoretical Maximum Density, Gmm	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482
% Voids in Total Mix (VTM)	5.4	5.4	5.0	5.4	4.5	4.7	4.8	4.7	#DIV/0!
% Compaction	94.6	94.6	95.0	94.6	95.5	95.3	95.2	95.3	#DIV/0!
Specimen Average Thickness (mm)					62.0	62.0			
Performance Test	HWT	HWT	HWT	HWT	Ideal-RT	Ideal-RT			
Date Sent	2/25/2020	2/25/2020	2/25/2020	2/25/2020					
To Whom	Ingevity	Ingevity	Ingevity	Ingevity					
Ideal-RT Load (KN)					6.119	5.542			
Ideal-RT Shear Strength (MPa)					1.849	1.675			
HWT Rut Depth @ 5,000 passes (mm)	3.26		1.85						
HWT Rut Depth @ 10,000 passes (mm)	4.12		2.16						
HWT Rut Depth @ 20,000 passes (mm)	5.23		2.65						
HWT Creep Slope	-7.890E-07		-2.676E-05						
HWT Stripping Slope	-8.414E-07		-2.680E-05						
Stripping Inflection Point (SIP)	20994		20996						
Stripping Number (LC_{SN})	>20002		>20002						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	1.34E-06		5.05E-07						
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})	-		-						
Corrected $RD_{10,000}$	4.14		2.20						
Corrected $RD_{20,000}$	5.19		2.60						
Terminal Rut Depth (mm)	5.23		2.64						
Terminal Rut Depth (in)	0.21		0.10						
Terminal Wheel Passes (N_{max})	20002		20002						
Rutting Resistance Index (RRI)	15883		17923						
Ideal-CT Fracture Energy (G_f)									
Ideal-CT Post-Peak Slope (S)									
Ideal-CT G_f/S									
Displacement (mm)									
Ideal-CT - CT Index									
Initial Dry Mass, g	2467.9	2467.1	2463.5	2464.9	2463.6	2465.1			
Mass of Dry, Sealed Specimen, g	2494.3	2493.4	2491.1	2491.4	2491.2	2491.5			
Mass of Sealed Specimen Submergered, g	1388.1	1386.8	1387.1	1372.1	1389.8	1388.8			
Final Mass Removed From Bag, g	2468.2	2467.2	2463.8	2465.8	2463.8	2465.8			
Apparent Specific Gravity of Bag***	0.8121	0.8121	0.8121	0.8121	0.8121	0.8121			
Bulk Specific Gravity	2.298	2.296	2.302	2.266	2.308	2.302			
Max Apparent Specific Gravity	2.482	2.482	2.482	2.482	2.482	2.482			

Air Voids, %	7.4	7.5	7.3	8.7	7.0	7.3			
Density	92.6	92.5	92.7	91.3	93.0	92.7			

Pill Designation	ST75.0-4-10	ST75.0-4-12	ST75.0-4-13	ST75.0-4-1	ST75.0-4-2	ST75.0-4-3	ST75.0-4-4	ST75.0-4-5	ST75.0-4-6
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	32	32	32	32	32	32	32	32	32
TT Mix Code	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7	ST7
Mix ID	B4	B4	B4	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5	5	5	5	5	5	5	5	5
Age Time	2	2	2	4	4	4	4	4	4
Dry Weight in Air, g (A)				2493.5	2463.7	2465.4			
Submerged Weight, g (B)				1459.8	1448.3	1448.0			
SSD Weight, g (C)				2502.4	2482.0	2482.2			
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	2.392	2.383	2.384	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	0.9	1.8	1.6	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482	2.482
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	3.6	4.0	4.0	#DIV/0!	#DIV/0!	#DIV/0!
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	96.4	96.0	96.0	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)									
Performance Test									
Date Sent									
To Whom									
Ideal-RT Load (KN)									
Ideal-RT Shear Strength (MPa)									
HWT Rut Depth @ 5,000 passes (mm)									
HWT Rut Depth @ 10,000 passes (mm)									
HWT Rut Depth @ 20,000 passes (mm)									
HWT Creep Slope									
HWT Stripping Slope									
Stripping Inflection Point (SIP)									
Stripping Number (LC_{SN})									
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})									
Corrected $RD_{10,000}$									
Corrected $RD_{20,000}$									
Terminal Rut Depth (mm)									
Terminal Rut Depth (in)									
Terminal Wheel Passes (N_{max})									
Rutting Resistance Index (RRI)									
Ideal-CT Fracture Energy (G_f)				14359	13272	14627			
Ideal-CT Post-Peak Slope (S)				3.02	2.65	2.29			
Ideal-CT G_f/S				4761	5016	6389			
Displacement (mm)				6.74	7.26	7.20			
Ideal-CT - CT Index				214	243	307			
Initial Dry Mass, g									
Mass of Dry, Sealed Specimen, g									
Mass of Sealed Specimen Submergered, g									
Final Mass Removed From Bag, g									
Apparent Specific Gravity of Bag***									
Bulk Specific Gravity									
Max Apparent Specific Gravity									

Air Voids, %									
Density									

Pill Designation	ST75.0-4-7	ST75.0-4-8	ST75.0-4-9	ST75.0-4-10	ST75.0-4-11	ST75.0-4-12
Date Compacted	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020	2/10/2020
Mix Number	32	32	32	32	32	32
TT Mix Code	ST7	ST7	ST7	ST7	ST7	ST7
Mix ID	B4	B4	B4	B4	B4	B4
Mix Type	BM2	BM2	BM2	BM2	BM2	BM2
Producer	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor	Summers Taylor
TDOT JMF#	1190378	1190378	1190378	1190378	1190378	1190378
Aggregate	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Binder	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000	Morelife 5000
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5	5	5	5	5	5
Age Time	4	4	4	4	4	4
Dry Weight in Air, g (A)						
Submerged Weight, g (B)						
SSD Weight, g (C)						
Bulk Specific Gravity, Gmb	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.482	2.482	2.482	2.482	2.482	2.482
% Voids in Total Mix (VTM)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Compaction	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)						
Performance Test						
Date Sent						
To Whom						
Ideal-RT Load (KN)						
Ideal-RT Shear Strength (MPa)						
HWT Rut Depth @ 5,000 passes (mm)						
HWT Rut Depth @ 10,000 passes (mm)						
HWT Rut Depth @ 20,000 passes (mm)						
HWT Creep Slope						
HWT Stripping Slope						
Stripping Inflection Point (SIP)						
Stripping Number (LC_{SN})						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})						
Corrected $RD_{10,000}$						
Corrected $RD_{20,000}$						
Terminal Rut Depth (mm)						
Terminal Rut Depth (in)						
Terminal Wheel Passes (N_{max})						
Rutting Resistance Index (RRI)						
Ideal-CT Fracture Energy (G_f)						
Ideal-CT Post-Peak Slope (S)						
Ideal-CT G_f/S						
Displacement (mm)						
Ideal-CT - CT Index						
Initial Dry Mass, g						
Mass of Dry, Sealed Specimen, g						
Mass of Sealed Specimen Submergered, g						
Final Mass Removed From Bag, g						
Apparent Specific Gravity of Bag***						
Bulk Specific Gravity						
Max Apparent Specific Gravity						

Air Voids, %						
Density						

Pill Designation	VH65.7-2-1	VH65.7-2-2	VH65.7-2-3	VH65.7-2-4	VH65.7-2-5	VH65.7-2-6	VH65.7-2-7
Date Compacted							
Mix Number	35	35	35	35	35	35	35
TT Mix Code	VH6	VH6	VH6	VH6	VH6	VH6	VH6
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2386.8	2394.1	2398.2	2399.6	2398.6	2397.3	2396.5
Submerged Weight, g (B)	1322.4	1333.1	1335.5	1335.5	1335.8	1337.3	1334.5
SSD Weight, g (C)	2405.5	2407.8	2414.1	2412.1	2411.6	2408.8	2410.2
Bulk Specific Gravity, Gmb	2.204	2.228	2.223	2.229	2.230	2.237	2.228
% Water Absorbed by Volume	1.7	1.3	1.5	1.2	1.2	1.1	1.3
Theoretical Maximum Density, Gmm	2.405	2.405	2.405	2.405	2.405	2.405	2.405
% Voids in Total Mix (VTM)	**8.4**	**7.4**	**7.5**	**7.3**	**7.3**	**7.0**	**7.4**
% Compaction	91.6	92.6	92.5	92.7	92.7	93.0	92.6
Specimen Average Thickness (mm)	61.8					61.5	61.8
Performance Test	Ideal RT	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT
Date Sent	1/8/2020	1/6/2020	1/6/2020	1/6/2020	1/6/2020	1/8/2020	1/8/2020
To Whom	Cynthia	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia
Ideal-RT Load (KN)	1.087					1.483	1.246
Ideal-RT Shear Strength (MPa)	0.329	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.452	0.378
HWT Rut Depth @ 5,000 passes (mm)		4.72		4.11			
HWT Rut Depth @ 10,000 passes (mm)		7.76		5.73			
HWT Rut Depth @ 20,000 passes (mm)		32.00		23.29			
HWT Creep Slope		0.0003535		0.0002175			
HWT Stripping Slope		0.002408		0.002899			
Stripping Inflection Point (SIP)		10611		14341			
Stripping Number (LC_{SN})		3238		3238			
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)		6.07E-06		5.71E-06			
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})		11413		15430			
Corrected $RD_{10,000}$		5.60		5.12			
Corrected $RD_{20,000}$		6.81		6.28			
Terminal Rut Depth (mm)		20.01		20.01			
Terminal Rut Depth (in)		0.79		0.79			
Terminal Wheel Passes (N_{max})		15022		18868			
Rutting Resistance Index (RRI)		3188		4004			
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	VH65.7-2-8	VH65.7-2-9	VH65.7-2-10	VH65.7-2-11	VH65.7-2-12	VH65.7-4-1	VH65.7-4-2
Date Compacted							
Mix Number	35	35	35	35	35	35	35
TT Mix Code	VH6	VH6	VH6	VH6	VH6	VH6	VH6
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2395.8					2396.7	2393.6
Submerged Weight, g (B)	1333.7					1329.5	1324.8
SSD Weight, g (C)	2409.1					2409.1	2406.4
Bulk Specific Gravity, Gmb	2.228	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.220	2.213
% Water Absorbed by Volume	1.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.1	1.2
Theoretical Maximum Density, Gmm	2.405	2.405	2.405	2.405	2.405	2.405	2.405
% Voids in Total Mix (VTM)	**7.4**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**7.7**	**8.0**
% Compaction	92.6	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	92.3	92.0
Specimen Average Thickness (mm)	61.7						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/6/2020	1/6/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	1.322						
Ideal-RT Shear Strength (MPa)	0.401	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						8350	7761
Ideal-CT Post-Peak Slope (S)						2.47	2.08

Ideal-CT G_f/S						3382	3729
Displacement (mm)						5.59	6.00
Ideal-CT - CT Index						126	149

Pill Designation	VH65.7-4-3	VH65.7-4-4	VH65.7-4-5	VH65.7-4-6	VH65.7-4-7	VH65.7-4-8
Date Compacted						
Mix Number	35	35	35	35	35	35
TT Mix Code	VH6	VH6	VH6	VH6	VH6	VH6
Mix ID	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	4	4	4	4	4	4
Dry Weight in Air, g (A)	2400.3	2400				
Submerged Weight, g (B)	1338.1	1339.3				
SSD Weight, g (C)	2412.2	2412.8				
Bulk Specific Gravity, Gmb	2.235	2.236	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.1	1.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.405	2.405	2.405	2.405	2.405	2.405
% Voids in Total Mix (VTM)	**7.1**	**7.0**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
% Compaction	92.9	93.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)						
Performance Test	Ideal CT	Ideal CT				
Date Sent	1/6/2020	1/6/2020				
To Whom	Ingevity	Ingevity				
Ideal-RT Load (KN)						
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)						
HWT Rut Depth @ 10,000 passes (mm)						
HWT Rut Depth @ 20,000 passes (mm)						
HWT Creep Slope						
HWT Stripping Slope						
Stripping Inflection Point (SIP)						
Stripping Number (LC_{SN})						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})						
Corrected $RD_{10,000}$						
Corrected $RD_{20,000}$						
Terminal Rut Depth (mm)						
Terminal Rut Depth (in)						
Terminal Wheel Passes (N_{max})						
Rutting Resistance Index (RRI)						
Ideal-CT Fracture Energy (G_f)	9099	9392				
Ideal-CT Post-Peak Slope (S)	2.31	2.04				

Ideal-CT G_f/S	3933	4608				
Displacement (mm)	6.04	6.14				
Ideal-CT - CT Index	158	189				

Pill Designation	VH66.2-2-1	VH66.2-2-2	VH66.2-2-3	VH66.2-2-4	VH66.2-2-5	VH66.2-2-6	VH66.2-2-7
Date Compacted							
Mix Number	36	36	36	36	36	36	36
TT Mix Code	VH6	VH6	VH6	VH6	VH6	VH6	VH6
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2377.8	2380.4	2375.2	2377.3	2380	2379.9	2378.7
Submerged Weight, g (B)	1320.8	1325.4	1314.7	1322.1	1322.3	1323.6	1321.2
SSD Weight, g (C)	2392.4	2393.4	2388.5	2394.5	2391	2391.8	2391.8
Bulk Specific Gravity, Gmb	2.219	2.229	2.212	2.217	2.227	2.228	2.222
% Water Absorbed by Volume	1.4	1.2	1.2	1.6	1.0	1.1	1.2
Theoretical Maximum Density, Gmm	2.387	2.387	2.387	2.387	2.387	2.387	2.387
% Voids in Total Mix (VTM)	**7.0**	**6.6**	**7.3**	**7.1**	**6.7**	**6.7**	**6.9**
% Compaction	93.0	93.4	92.7	92.9	93.3	93.3	93.1
Specimen Average Thickness (mm)					61.6	61.5	61.7
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/6/2020	1/6/2020	1/6/2020	1/6/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					1.435	1.297	1.765
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.437	0.395	0.536
HWT Rut Depth @ 5,000 passes (mm)	5.93		4.38				
HWT Rut Depth @ 10,000 passes (mm)	11.36		6.31				
HWT Rut Depth @ 20,000 passes (mm)	42.47		32.09				
HWT Creep Slope	0.0004705		0.0002553				
HWT Stripping Slope	0.003089		0.003147				
Stripping Inflection Point (SIP)	9699		13379				
Stripping Number (LC_{SN})	2895		2895				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	8.56E-06		6.16E-06				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	9986		12893				
Corrected $RD_{10,000}$	7.01		5.25				
Corrected $RD_{20,000}$	8.62		6.38				
Terminal Rut Depth (mm)	20.04		20.04				
Terminal Rut Depth (in)	0.79		0.79				
Terminal Wheel Passes (N_{max})	12738		16170				
Rutting Resistance Index (RRI)	2688		3412				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	VH66.2-2-8	VH66.2-2-9	VH66.2-2-10	VH66.2-2-11	VH66.2-2-12	VH66.2-4-1	VH66.2-4-2
Date Compacted							
Mix Number	36	36	36	36	36	36	36
TT Mix Code	VH6	VH6	VH6	VH6	VH6	VH6	VH6
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	64-22	64-22	64-22	64-22	64-22	64-22	64-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2381.1					2377.6	2374.3
Submerged Weight, g (B)	1327.2					1320.7	1317.4
SSD Weight, g (C)	2399.3					2392.4	2389
Bulk Specific Gravity, Gmb	2.221	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.219	2.216
% Water Absorbed by Volume	1.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.4	1.4
Theoretical Maximum Density, Gmm	2.387	2.387	2.387	2.387	2.387	2.387	2.387
% Voids in Total Mix (VTM)	**7.0**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**7.1**	**7.2**
% Compaction	93.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	92.9	92.8
Specimen Average Thickness (mm)	61.9						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/6/2020	1/6/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	2.159						
Ideal-RT Shear Strength (MPa)	0.654	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						8688	10269
Ideal-CT Post-Peak Slope (S)						1.89	1.47

Ideal-CT G_f/S						4603	7008
Displacement (mm)						6.99	7.35
Ideal-CT - CT Index						214	343

Pill Designation	VH66.2-4-3	VH66.2-4-4	VH66.2-4-5	VH66.2-4-6	VH66.2-4-7	VH66.2-4-8			
Date Compacted									
Mix Number	36	36	36	36	36	36			
TT Mix Code	VH6	VH6	VH6	VH6	VH6	VH6			
Mix ID	D5	D5	D5	D5	D5	D5			
Mix Type	D	D	D	D	D	D			
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan			
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208			
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone			
Binder	64-22	64-22	64-22	64-22	64-22	64-22			
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25			
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50			
Asphalt Content	6.2	6.2	6.2	6.2	6.2	6.2			
Age Time	4	4	4	4	4	4			
Dry Weight in Air, g (A)	2376.5	2376.3							
Submerged Weight, g (B)	1319.6	1320.9							
SSD Weight, g (C)	2391.8	2391.4							
Bulk Specific Gravity, Gmb	2.216	2.220	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
% Water Absorbed by Volume	1.4	1.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
Theoretical Maximum Density, Gmm	2.387	2.387	2.387	2.387	2.387	2.387			
% Voids in Total Mix (VTM)	**7.1**	**7.0**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**			
% Compaction	92.9	93.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
Specimen Average Thickness (mm)									
Performance Test	Ideal CT	Ideal CT							
Date Sent	1/6/2020	1/6/2020							
To Whom	Ingevity	Ingevity							
Ideal-RT Load (KN)									
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
HWT Rut Depth @ 5,000 passes (mm)									
HWT Rut Depth @ 10,000 passes (mm)									
HWT Rut Depth @ 20,000 passes (mm)									
HWT Creep Slope									
HWT Stripping Slope									
Stripping Inflection Point (SIP)									
Stripping Number (LC_{SN})									
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)									
Stripping Strain (ε^{vt})									
Stripping Life (LC_{ST})									
Corrected $RD_{10,000}$									
Corrected $RD_{20,000}$									
Terminal Rut Depth (mm)									
Terminal Rut Depth (in)									
Terminal Wheel Passes (N_{max})									
Rutting Resistance Index (RRI)									
Ideal-CT Fracture Energy (G_f)	9115	8460							
Ideal-CT Post-Peak Slope (S)	1.80	1.67							

Ideal-CT G_f/S	5073	5053							
Displacement (mm)	6.67	6.68							
Ideal-CT - CT Index	226	225							

Pill Designation	VH75.7-2-1	VH75.7-2-2	VH75.7-2-3	VH75.7-2-4	VH75.7-2-5	VH75.7-2-6	VH75.7-2-7
Date Compacted							
Mix Number	37	37	37	37	37	37	37
TT Mix Code	VH7	VH7	VH7	VH7	VH7	VH7	VH7
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2397.5	2400.1	2399.5	2398.1	2400	2402.4	2398.6
Submerged Weight, g (B)	1343.9	1343.8	1344.9	1345.6	1345	1347.6	1348
SSD Weight, g (C)	2411.7	2416.1	2414.5	2415.1	2416	2416.1	2412.8
Bulk Specific Gravity, Gmb	2.245	2.238	2.243	2.242	2.241	2.248	2.253
% Water Absorbed by Volume	1.3	1.5	1.4	1.6	1.5	1.3	1.3
Theoretical Maximum Density, Gmm	2.405	2.405	2.405	2.405	2.405	2.405	2.405
% Voids in Total Mix (VTM)	6.6	6.9	6.7	6.8	6.8	6.5	6.3
% Compaction	93.4	93.1	93.3	93.2	93.2	93.5	93.7
Specimen Average Thickness (mm)					62.0	61.7	61.7
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/6/2020	1/6/2020	1/6/2020	1/6/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					4.182	4.338	4.41
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.264	1.317	1.339
HWT Rut Depth @ 5,000 passes (mm)	2.13		2.48				
HWT Rut Depth @ 10,000 passes (mm)	2.47		3.04				
HWT Rut Depth @ 20,000 passes (mm)	2.90		3.98				
HWT Creep Slope	-3.62E-05		-7.27E-06				
HWT Stripping Slope	-3.62E-05		-7.32E-06				
Stripping Inflection Point (SIP)	20992		20985				
Stripping Number (LC_{SN})	>20002		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	5.78E-07		9.12E-07				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	-		-				
Corrected $RD_{10,000}$	2.49		3.13				
Corrected $RD_{20,000}$	2.95		3.85				
Terminal Rut Depth (mm)	2.91		3.99				
Terminal Rut Depth (in)	0.11		0.16				
Terminal Wheel Passes (N_{max})	20002		20002				
Rutting Resistance Index (RRI)	17710		16860				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	VH75.7-2-8	VH75.7-2-9	VH75.7-2-10	VH75.7-2-11	VH75.7-2-12	VH75.7-4-1	VH75.7-4-2
Date Compacted							
Mix Number	37	37	37	37	37	37	37
TT Mix Code	VH7	VH7	VH7	VH7	VH7	VH7	VH7
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2396.8					2400.2	2401.1
Submerged Weight, g (B)	1345.1					1340.7	1350.8
SSD Weight, g (C)	2413					2412.2	2420.4
Bulk Specific Gravity, Gmb	2.244	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.240	2.245
% Water Absorbed by Volume	1.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.1	1.8
Theoretical Maximum Density, Gmm	2.405	2.405	2.405	2.405	2.405	2.405	2.405
% Voids in Total Mix (VTM)	**6.7**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.9**	**6.7**
% Compaction	93.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.1	93.3
Specimen Average Thickness (mm)	61.8						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/6/2020	1/6/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	4.04						
Ideal-RT Shear Strength (MPa)	1.226	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						11345	11402
Ideal-CT Post-Peak Slope (S)						3.33	3.24

Ideal-CT G_f/S						3412	3520
Displacement (mm)						6.06	5.77
Ideal-CT - CT Index						138	135

Pill Designation	VH75.7-4-3	VH75.7-4-4	VH75.7-4-5	VH75.7-4-6	VH75.7-4-7	VH75.7-4-8
Date Compacted						
Mix Number	37	37	37	37	37	37
TT Mix Code	VH7	VH7	VH7	VH7	VH7	VH7
Mix ID	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	5.7	5.7	5.7	5.7	5.7	5.7
Age Time	4	4	4	4	4	4
Dry Weight in Air, g (A)	2398	2399.5				
Submerged Weight, g (B)	1347.2	1344.6				
SSD Weight, g (C)	2413.9	2414.3				
Bulk Specific Gravity, Gmb	2.248	2.243	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.5	1.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.405	2.405	2.405	2.405	2.405	2.405
% Voids in Total Mix (VTM)	6.5	6.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Compaction	93.5	93.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)						
Performance Test	Ideal CT	Ideal CT				
Date Sent	1/6/2020	1/6/2020				
To Whom	Ingevity	Ingevity				
Ideal-RT Load (KN)						
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)						
HWT Rut Depth @ 10,000 passes (mm)						
HWT Rut Depth @ 20,000 passes (mm)						
HWT Creep Slope						
HWT Stripping Slope						
Stripping Inflection Point (SIP)						
Stripping Number (LC_{SN})						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})						
Corrected $RD_{10,000}$						
Corrected $RD_{20,000}$						
Terminal Rut Depth (mm)						
Terminal Rut Depth (in)						
Terminal Wheel Passes (N_{max})						
Rutting Resistance Index (RRI)						
Ideal-CT Fracture Energy (G_f)	12320	10612				
Ideal-CT Post-Peak Slope (S)	3.13	3.23				

Ideal-CT G_f/S	3941	3290				
Displacement (mm)	6.78	6.04				
Ideal-CT - CT Index	178	132				

Pill Designation	VH76.2-2-1	VH76.2-2-2	VH76.2-2-3	VH76.2-2-4	VH76.2-2-5	VH76.2-2-6	VH76.2-2-7
Date Compacted							
Mix Number	38	38	38	38	38	38	38
TT Mix Code	VH7	VH7	VH7	VH7	VH7	VH7	VH7
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	6.2	4.3	4.3	4.3	4.3	4.3	4.3
Age Time	2	2	2	2	2	2	2
Dry Weight in Air, g (A)	2377.2	2376.6	2375.9	2379.2	2379.9	2381.8	2378.2
Submerged Weight, g (B)	1322.8	1319.9	1320.6	1321.7	1322.1	1328.2	1322.7
SSD Weight, g (C)	2393.1	2392.9	2388.6	2392.2	2393.6	2396.8	2391.4
Bulk Specific Gravity, Gmb	2.221	2.215	2.225	2.223	2.221	2.229	2.225
% Water Absorbed by Volume	1.5	1.5	1.2	1.2	1.3	1.4	1.2
Theoretical Maximum Density, Gmm	2.387	2.387	2.387	2.387	2.387	2.387	2.387
% Voids in Total Mix (VTM)	**7.0**	**7.2**	**6.8**	**6.9**	**7.0**	**6.6**	**6.8**
% Compaction	93.0	92.8	93.2	93.1	93.0	93.4	93.2
Specimen Average Thickness (mm)					61.9	61.9	61.8
Performance Test	HWT	HWT	HWT	HWT	Ideal RT	Ideal RT	Ideal RT
Date Sent	1/6/2020	1/6/2020	1/6/2020	1/6/2020	1/8/2020	1/8/2020	1/8/2020
To Whom	Ingevity	Ingevity	Ingevity	Ingevity	Cynthia	Cynthia	Cynthia
Ideal-RT Load (KN)					2.698	2.553	2.827
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.816	0.773	0.857
HWT Rut Depth @ 5,000 passes (mm)	3.29		2.71				
HWT Rut Depth @ 10,000 passes (mm)	3.88		3.23				
HWT Rut Depth @ 20,000 passes (mm)	4.67		4.22				
HWT Creep Slope	-4.91E-05		2.28E-05				
HWT Stripping Slope	-4.92E-05		2.27E-05				
Stripping Inflection Point (SIP)	20992		20993				
Stripping Number (LC_{SN})	>20002		>20002				
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)	9.36E-07		8.36E-07				
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})	-		-				
Corrected $RD_{10,000}$	3.9		3.33				
Corrected $RD_{20,000}$	4.65		3.99				
Terminal Rut Depth (mm)	4.67		4.21				
Terminal Rut Depth (in)	0.18		0.17				
Terminal Wheel Passes (N_{max})	20002		20002				
Rutting Resistance Index (RRI)	16324		16687				
Ideal-CT Fracture Energy (G_f)							
Ideal-CT Post-Peak Slope (S)							

Ideal-CT G_f/S							
Displacement (mm)							
Ideal-CT - CT Index							

Pill Designation	VH76.2-2-8	VH76.2-2-9	VH76.2-2-10	VH76.2-2-11	VH76.2-2-12	VH76.2-4-1	VH76.2-4-2
Date Compacted							
Mix Number	38	38	38	38	38	38	38
TT Mix Code	VH7	VH7	VH7	VH7	VH7	VH7	VH7
Mix ID	D5	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content	4.3						
Age Time	2	2	2	2	2	4	4
Dry Weight in Air, g (A)	2377.6					2379.3	2378.3
Submerged Weight, g (B)	1325.2					1330.9	1331
SSD Weight, g (C)	2391.7					2397.3	2394
Bulk Specific Gravity, Gmb	2.229	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.231	2.237
% Water Absorbed by Volume	1.3	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.7	1.5
Theoretical Maximum Density, Gmm	2.387	2.387	2.387	2.387	2.387	2.387	2.387
% Voids in Total Mix (VTM)	**6.6**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**6.5**	**6.3**
% Compaction	93.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	93.5	93.7
Specimen Average Thickness (mm)	61.7						
Performance Test	Ideal RT					Ideal CT	Ideal CT
Date Sent	1/8/2020					1/6/2020	1/6/2020
To Whom	Cynthia					Ingevity	Ingevity
Ideal-RT Load (KN)	2.439						
Ideal-RT Shear Strength (MPa)	0.741	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)							
HWT Rut Depth @ 10,000 passes (mm)							
HWT Rut Depth @ 20,000 passes (mm)							
HWT Creep Slope							
HWT Stripping Slope							
Stripping Inflection Point (SIP)							
Stripping Number (LC_{SN})							
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)							
Stripping Strain (ε^{vt})							
Stripping Life (LC_{ST})							
Corrected $RD_{10,000}$							
Corrected $RD_{20,000}$							
Terminal Rut Depth (mm)							
Terminal Rut Depth (in)							
Terminal Wheel Passes (N_{max})							
Rutting Resistance Index (RRI)							
Ideal-CT Fracture Energy (G_f)						13540	12505
Ideal-CT Post-Peak Slope (S)						2.04	2.52

Ideal-CT G_f/S						6632	4966
Displacement (mm)						7.73	7.17
Ideal-CT - CT Index						342	237

Pill Designation	VH76.2-4-3	VH76.2-4-4	VH76.2-4-5	VH76.2-4-6	VH76.2-4-7	VH76.2-4-8
Date Compacted						
Mix Number	38	38	38	38	38	38
TT Mix Code	VH7	VH7	VH7	VH7	VH7	VH7
Mix ID	D5	D5	D5	D5	D5	D5
Mix Type	D	D	D	D	D	D
Producer	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan	Vulcan
TDOT JMF#	3190208	3190208	3190208	3190208	3190208	3190208
Aggregate	Limestone	Limestone	Limestone	Limestone	Limestone	Limestone
Binder	76-22	76-22	76-22	76-22	76-22	76-22
Additive	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25	Evotherm P25
Amount of Additive	0.50	0.50	0.50	0.50	0.50	0.50
Asphalt Content						
Age Time	4	4	4	4	4	4
Dry Weight in Air, g (A)	2376.8	2379.2				
Submerged Weight, g (B)	1328	1333.9				
SSD Weight, g (C)	2395.3	2397.5				
Bulk Specific Gravity, Gmb	2.227	2.237	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
% Water Absorbed by Volume	1.7	1.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Theoretical Maximum Density, Gmm	2.387	2.387	2.387	2.387	2.387	2.387
% Voids in Total Mix (VTM)	**6.7**	**6.3**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
% Compaction	93.3	93.7	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Specimen Average Thickness (mm)						
Performance Test	Ideal CT	Ideal CT				
Date Sent	1/6/2020	1/6/2020				
To Whom	Ingevity	Ingevity				
Ideal-RT Load (KN)						
Ideal-RT Shear Strength (MPa)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
HWT Rut Depth @ 5,000 passes (mm)						
HWT Rut Depth @ 10,000 passes (mm)						
HWT Rut Depth @ 20,000 passes (mm)						
HWT Creep Slope						
HWT Stripping Slope						
Stripping Inflection Point (SIP)						
Stripping Number (LC_{SN})						
Viscoplastic Strain Increment ($\Delta\varepsilon^{vp}$)						
Stripping Strain (ε^{vt})						
Stripping Life (LC_{ST})						
Corrected $RD_{10,000}$						
Corrected $RD_{20,000}$						
Terminal Rut Depth (mm)						
Terminal Rut Depth (in)						
Terminal Wheel Passes (N_{max})						
Rutting Resistance Index (RRI)						
Ideal-CT Fracture Energy (G_f)	13842	13292				
Ideal-CT Post-Peak Slope (S)	2.07	2.05				
Ideal-CT G_f/S	6675	6495				
Displacement (mm)	8.03	7.00				
Ideal-CT - CT Index	357	303				