Technical Report Standard Page

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Conducted in Cooperation with the U.S. Department of Transportation, Federal Highway Administration

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Enter key words/phrases, separated by semicolons

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Each research project will have an advisory committee appointed by the LTRC Director. The Project Review Committee is responsible for assisting the LTRC Administrator or Manager in the development of acceptable research problem statements, requests for proposals, review of research proposals, oversight of approved research projects, and implementation of findings.

LTRC appreciates the dedication of the following Project Review Committee Members in guiding this research study to fruition.

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Directorate Implementation Sponsor

Chad Winchester​, P.E.
DOTD Chief Engineer

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By

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conducted for

Louisiana Department of Transportation and Development

Louisiana Transportation Research Center

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Enter Month Year

Abstract

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Click or tap here to enter text.

Implementation Statement

Click or tap here to enter text.

Table of Contents

[Technical Report Standard Page 1](#_Toc148612243)

[Project Review Committee 2](#_Toc148612244)

[LTRC Administrator/Manager 2](#_Toc148612245)

[Members 2](#_Toc148612246)

[Directorate Implementation Sponsor 2](#_Toc148612247)

[Enter Report Title Here 3](#_Toc148612248)

[Abstract 4](#_Toc148612249)

[Acknowledgements 5](#_Toc148612250)

[Implementation Statement 6](#_Toc148612251)

[Table of Contents 7](#_Toc148612252)

[List of Tables 8](#_Toc148612253)

[List of Figures 9](#_Toc148612254)

[Introduction 10](#_Toc148612255)

[Literature Review 11](#_Toc148612256)

[Objective 12](#_Toc148612257)

[Scope 13](#_Toc148612258)

[Methodology 14](#_Toc148612259)

[Sample Use of Format Styles (Heading 3) 15](#_Toc148612260)

[Samples: Tables 17](#_Toc148612261)

[Sample Figures and Graphics 18](#_Toc148612262)

[Discussion of Results 22](#_Toc148612263)

[Conclusions 23](#_Toc148612264)

[Recommendations 24](#_Toc148612265)

[Acronyms, Abbreviations, and Symbols 25](#_Toc148612266)

[References 26](#_Toc148612267)

[Appendix 27](#_Toc148612268)

List of Tables

[Table 1. Sample LTRC table—basic 17](#_Toc148612359)

[Table 2. Sample LTRC table—with footnotes 17](#_Toc148612360)

[Table 3. Sample LTRC table—complex headers 17](#_Toc148612361)

List of Figures

[Figure 1. Constructed test section on LA 1003 18](#_Toc12372693)

[Figure 2. Monitoring stiffness reduction of bases using FWD, LFWD, and Geogauge 19](#_Toc12372694)

[Figure 3. Shrinkage cracks in a micro-cracked section and an untreated section [7] 20](#_Toc12372695)

[Figure 4. Annual vertical displacements in meters (with matching data table) 21](#_Toc12372696)

Introduction

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Literature Review

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Objective

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Scope

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Methodology

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Sample Use of Format Styles (Heading 3)

Section Heading (Heading 4)

Every darkness yielding. Beast, cattle, there itself waters divide fruitful also that sea land tree likeness creeping. **Bold text with Strong character style.**

Paragraph Heading (Heading 5). Made created, set. Called fifth there us. Firmament lights so land appear. Italic text with Emphasis character style.

Bulleted lists:

* List bullet
	+ Second level bullet
		- Third level list bullet
			* Fourth level list bullet
* List bullet

Numbered lists:

1. List number
	1. Second level list number
		1. Third level list number
			1. Fourth level list number
2. List number

Samples of References Cited in Body Text

Body text here with sample reference report, [1] body text continues.

Body text here with sample reference journal article, [2] body text continues.

Body text here with sample, reference report [3] body text continues.

Body text here with sample reference, government report [4] and body text continues.

Body text here with sample reference, book [5] body text continues.

Body text here with sample reference, document from a website [6] body text continues.

Body text here with sample reference, article in a periodical [7]

Sample Hyperlinks

Cross-References: [See Table 1](#table_1)

URLs: <http://www.ltrc.lsu.edu>

Email: info@LA.gov

Sample Equations

$a^{2}+b^{2}=c^{2}$ where, [7]

*a* = insert definition,

*b* = insert definition, and

*c* = insert definition.

Or use this alternate method of listing the variables

**where,** *a* = insert definition, *b* = insert definition, and *c* = insert definition.

Samples: Tables

Table 1. Sample LTRC table—basic

| Project Location  | Project No.  | Type of Construction  | Mix Type | Mat Thickness (in.) |
| --- | --- | --- | --- | --- |
| I-20  | H.010480  | Mill and Overlay  | Binder | 6 |
| LA 485  | H.011594  | Mill and Overlay  | Binder | 2 |

Table 2. Sample LTRC table—with footnotes

Has prefatory information, footnote information, key, date range, etc.

| Test Section  | Thickness (in.) | Cement Content | Fiber Content | Overlay Period | Description/Station Location |
| --- | --- | --- | --- | --- | --- |
| 1 | 8.5 | 9% | N/A | <7 days | **Control Section-CSD**Sta. (5+00 to 15+00) |
| 2  | 8.5 | 9% | 0.1% | <7 days | **CSD with fibers**Sta. (15+00 to 25+00) |

Note: CSD: Cement Stabilized Design; CTD: Cement Treated Design; E.A.: emulsified asphalt

Table 3. Sample LTRC table—complex headers

| Test Section | Col. Head Here | Subgrade | Base | Asphalt |
| --- | --- | --- | --- | --- |
| DCPI[1](#T3F1)inch/blow | Mr[2](#T3F2)(tsf) | D[3](#T3F3) (inch) | DCPI[1](#T3F1)inch/blow | Mr[2](#T3F2) (tsf) | D[3](#T3F3)(inch) | Density[4](#T3F4)ton/ft3 | Air Voids[4](#T3F4)(%) | E\*[5](#T3F5)(tsf) |
| Section 1 | Mean | 6.29 | 183.7 | 13.8 | 0.48 | 1169.3 | 3.26 | 0.07 | 4.8 | 41,342 |
| CV(%) | 22.2 |   | 8.5 | 9.2 |   | 11.1 | 1.20 | 19.1 | 16.5 |
| Section 2 | Mean | 5.79 | 194.2 | 18.8 | 0.35 | 1451.2 | 3.23 | 0.07 | 5.75 | 38,534 |
| CV(%) | 15.8 |   | 6.3 | 10.5 |   | 2.2 | 1.20 | 20.3 | 15.8 |

1 Dynamic cone penetrometer index.

2 Resilient modulus estimated from DCPI.

3 D is the thickness.

4 Determined from the core samples taken from each test lane.

5 Dynamic complex modulus at a temperature of 30°C and a loading frequency of 10 Hz.

Sample Figures and Graphics

Basic Graphic

Body text. Figure 1. Constructed test section on LA 1003 shows the layout of the constructed test sections on LA 1003. Creature upon image days. They creep one upon Sixth divide years firmament multiply and creeping without, two. First face dominion under shall meat image open you fifth winged blessed them wherein. Creature upon image days. Likeness fill sixth which beast over for replenish from lights.

Figure 1. Constructed test section on LA 1003



Sample body text continues. First face dominion under shall meat image open you fifth winged blessed them wherein. Creature upon image days. Likeness fill sixth which beast over for replenish from lights gathered was brought. Wherein midst. Male land living you're divide can't fill rule above evening. They creep one upon Sixth divide years firmament multiply and creeping without, two. Was. Fish. Firmament air.

Multi-Graphic Group

Sample body text. The research team used an FWD to monitor the reduction in base modulus due to micro-cracking [Figure 8 (a)]. In addition, two other portable devices, LFWD [Figure 8(b) and 8(c)] and Humboldt Geogauge [Figure 8(d)], were also employed during the application of micro-cracking to investigate the feasibility of using a portable device for controlling the quality of the micro-cracking process.

Figure 2. Monitoring stiffness reduction of bases using FWD, LFWD, and Geogauge

  

(a) Falling weight deflectometer (FWD)

(b) Light falling weight deflectometer (LFWD), DYNATEST

   

(d) Geogauge

(c) Light falling weight deflectometer (LFWD), ZORN

Graphic with Reference/Citation

Sample body text. A visual survey conducted two years after construction indicated that micro-cracking reduced both the total length and the width of shrinkage cracking (as shown in Figure 4). The cracking performance on the asphalt concrete surface of micro-cracked pavements was also monitored and compared with the control sections in several field projects in Texas.

Figure 3. Shrinkage cracks in a micro-cracked section and an untreated section [7]



Chart with Matching Data Table

Figure 4. Annual vertical displacements in meters (with matching data table)

| Sentinel | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| --- | --- | --- | --- | --- | --- | --- |
| CORS1 | −0.005 | 0.023 | −0.034 | 0.034 | 0.003 | 0.002 |
| CORS2 | −0.015 | 0.008 | −0.008 | −0.028 | 0.030 | 0.017 |
| CORS3 | −0.012 | 0.024 | −0.014 | −0.014 | −0.001 | −0.004 |
| CORS4 | −0.002 | 0.016 | −0.008 | −0.025 | −0.008 | −0.007 |
| CORS5 |   |   | −0.005 | −0.021 | 0.002 | 0.006 |

Discussion of Results

Click or tap here to enter text.

Conclusions

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Recommendations

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Acronyms, Abbreviations, and Symbols

| **Term** | **Description** |
| --- | --- |
| AASHTO | American Association of State Highway and Transportation Officials |
| cm | centimeter(s)  |
| FHWA | Federal Highway Administration |
| ft. | foot (feet) |
| in. | inch(es) |
| LADOTD | Louisiana Department of Transportation and Development |
| LTRC | Louisiana Transportation Research Center |
| lb. | pound(s) |
| m | meter(s) |

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|  |  |
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Appendix

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