**Table C-10. Bridge S06 of 82194 Deck Construction (Contd.)**

**Project:** Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

**DECK CONCRETING**

Bridge ID: I-95 over Fort

Date: 08/19/02

Recorder: Upul.

| | Concreting | Leveling | Lines | Curing | Burlap |
|---|---|---|---|---|---|
| 29 | F. 10:49 | S. 11:18<br>F. 11:23 | S. 12:05 a.m.<br>F. 12:06 | | |
| 30 | S. 11:07 | S. 11:23<br>m/c moved. | S. 12:11<br>F. 12:13 | | |
| 31 | F. 11:09 | S. 11:41<br>F. 11:45 | S. 12:16 | | |
| 32 | S. 11:09 | S. 11:45<br>F. 11:50 | F. 12:17 | | |
| 33 | F. 11:13 | S. 11:50<br>F. 11:56 | S. 12:25<br>F. 12:26 | | |
| 34 | | S. 11:56<br>F. 12:01 a.m | | | |
| 35 | S. 11:30 | S. 12:01<br>F. 12:05 | S. 12:42<br>F. 12:43 | S. 1:53<br>F. 1:54 | |
| 36 | F. 11:31 | S. 12:05<br>F. 12:09 | | | |
| 37 | | S. 12:09<br>F. 12:13 | S. 12:45 | | |
| 38 | | S. 12:13<br>F. 12:18 | F. 12:46 | | |
| 39 | | | | | |
| 40 | | | | | |

* Levelling repeated within 25 yards & 30 yards from 11:27 p.m to 11:41 p.m.

* A Crew-man was walking on the deck [within 1 yards – 10 yards area] while applying curing compounds.

S: Start. F: Finish

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**Table C-10. Bridge S06 of 82194 Deck Construction (Contd.)**

**Project:** Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

**DECK CONCRETING**

Bridge ID: f-75 over Fort

Date: 08/19/02

Recorder: [illegible]

S: Start. F: Finish

| | Concreting | Leveling | Lines | Curing | Burlap |
|---|---|---|---|---|---|
| 14 | | S. 10:12 F. 10:15 | S. 10:34 F. 10:34 | | |
| 15 | S. 9:48 | S. 10:15 F. 10:18 | S. 10:41 | | |
| 16 | F. 9:49 | S. 10:18 F. 10:20 | F. 10:43 | S. 2:00 | |
| 17 | | S. 10:20 F. 10:23 | S. 10:45 F. 10:45 | F. 2:05 | |
| 18 | S. 10:08 | S. 10:23 F. 10:28 | S. 10:47 F. 10:48 | | |
| 19 | F. 10:10 | S. 10:28 F. 10:34 | S. 10:51 | | |
| 20 | S. 10:10 | | F. 10:52 | | |
| 21 | F. 10:13 | S. 10:36 F. 10:40 | S. 10:53 F. 10:54 | | |
| 22 | S. 10:26 | S. 10:40 F. 10:45 | S. 11:18 F. 11:19 | | |
| 23 | F. 10:29 | S. 10:45 F. 10:49 | S. 11:58 F. 11:59 | | |
| 24 | S. 10:29 | S. 10:49 F. 10:52 | S. 11:59 | S. 1:56 | |
| 25 | F. 10:37 | S. 10:52 F. 10:56 | F. 0:01 a.m. | F. 1:59 | |
| 26 | S. 10:49 | S. 11:02 F. 11:05 | | | |
| 27 | F. 11:02 | S. 11:02 a.m. F. 11:14 | S. 0:02 | | |
| 28 | | S. 11:43 a.m. F. 11:18 | F. 0:03 | | |
| 29 | S. 11:02 | S. 11:05 F. 11:23 | S. 0:05 F. 0:06 | | |
| 30 | F. 11:07 | S. 11:23 ~~F. 0:3~~ | S. 0:11 F. 0:13 | | |
| 31 | S. 11:13 | S. 11:16 F. 11:45 | S. 0:16 F. 0:17 | | |
| 32 | F. 11:20 | S. 11:48 F. 11:50 | | | |
| 33 | | S. 11:50 F. 11:56 | S. 0:25 F. 0:26 | | |
| 34 | S. 11:23 | S. 11:56 F. 0:01 a.m. | | | |
| 35 | F. 11:30 | S. 0:01 F. 0:05 | S. 0:42 | S. 1:53 | |
| 36 | S. 11:31 | S. 0:05 F. 0:09 | F. 0:43 | F. 1:54 | |
| 37 | F. 11:41 | S. 0:09 F. 0:13 | S. 0:45 | | |
| 38 | S. 11:41 | S. 0:13 F. 0:18 | F. 0:46 | | |
| 39 | F. 0:11 a.m. | S. 0:18 F. 0:22 | S. 0:51 F. 0:52 | | |
| 40 | S. 0:11 | S. 0:22 F. 0:27 | S. 0:52 | | |
| 41 | F. 0:18 | S. 0:27 F. 0:32 | F. 0:54 | | |

m/c stopped @ 10:31 Restarted @ 10:35

m/c stopped @ 10:55 Restarted @ 11:01

m/c stopped @ 11:20 Restarted @ 11:23

m/c stopped @ 11:48 Restarted @ 0:10 a.m.

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**Table C-10. Bridge S06 of 82194 Deck Construction (Contd.)**

**Project:** Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

**DECK CONCRETING**

Bridge ID: I-75 over Fort

Date: 08/19/02

Recorder: Upul.

| | Concreting | Leveling | Lines | Curing | Burlap |
|---|---|---|---|---|---|
| 42 | S. 0:18 | S. 0:32 F. 0:36 | S. 0:56 F. 0:57 | | |
| 43 | F. 0:24 | S. 0:36 F. 0:41 | S. 0:59 F. 0:59 | S. 1:51 F. 1:53 | |
| 44 | S. 0:24 | S. 0:41 F. 0:45 | S. 1:01 | | |
| 45 | F. 0:32 | S. 0:45 F. 0:48 | F. 1:03 | | |
| 46 | S. 0:32 | S. 0:48 F. 0:51 | S. 1:21 F. 1:21 | | |
| 47 | F. 0:37 | S. 0:51 F. 0:54 | S. 1:24 F. 1:25 | | |
| 48 | | S. 0:54 F. 0:57 | S. 1:27 F. 1:28 | S: 1:40 F: 1:45 | |
| 49 | S. 0:37 | S. 0:57 F. 1:01 | S. 1:29 F. 1:29 | | |
| 50 | F. 0:42 | S. 1:01 F. 1:04 | S. 1:33 F. 1:33 | | |
| 51 | S. 0:42 | S. 1:04 F. 1:23 | S. 1:34 F. 1:34 | | |
| 52 | F. 0:47 | S. 1:23 F. 1:25 | S. 2:11 F. 2:12 | | |
| 53 | | S. 1:25 F. 1:27 | | | |
| 54 | S: 0:47 | S. 1:27 F. 1:28 | S. 2:16 | S: 2:22 | |
| 55 | F. 1:22 | S. 1:28 F. 1:29 | F. 2:17 | F: 2:25 | |
| 56 | | S. 1:29 F. 1:32 | S. 2:18 F. 2:18 | | |
| 57 | S. 1:22 F. 1:24 | | | | |
| 58 | | S. 1:59 | | | |
| 59 | S. 1:24 | F. 2:09 | S. 2:19 | | |
| 60 | F. 2:02 | | F. 2:20 | | |
| 61 | | | | | |
| 62 | | | | | |
| 63 | | | | | |
| 64 | | | | | |
| 65 | | | | | |
| 66 | | | | | |
| 67 | | | | | |
| 68 | | | | | |
| 69 | | | | | |

m/c stopped @ 0:47 Restarted @1:19

m/c stopped @ 1:26 Restarted @ 1:57

S: Start. F: Finish

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**Table C-11. Bridge S06 of 82194 Ticket Information**

**Project:** Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

**TICKET INFORMATION**

Bridge ID: I75 Over Fort Date: 8/19/02 Recorder: REYNALDO PABLO JR.

| | Company Name | Truck # | Production Time (Concrete Plant) | Arrival Time (Casting Site) | Unloading Time Start | Unloading Time Finish | Cummulative Qty (yard³) |
|---|---|---|---|---|---|---|---|
| 1. | MICHIGAN | 461 | 8.56 / 8:50 | 9:12 | 9.25 | 9.30 | 8.41 |
| 2. | FOUNDATION | 462 | 9.05 / 9.05 | 9:20 | 9.29 | 9:39 | 16.82 |
| 3. | CONCRETE | 424 | 9.13 / 9.05 | 9.33 | 9.38 | 9.45 | 24.47 |
| 4. | | 433 | 9.19 / 9.15 | 9.38 | 9.44 | 9.50 | 31.35 |
| 5. | | 414 | 9.28 / 9.25 | 9.39 | 9.49 | 9.57 | 38.99 |
| 6. | | 432 | 9.36 / 9.30 | 9.53 | 9.56 | 10.04 | 46.64 |
| 7. | | 460 | 9.46 / 9.43 | 10.01 | 10.04 | 10.11 | 55.05 |
| 8. | | 430 | 9.52 / 9.56 | 10.06 | 10.11 | 10.20 | 62.69 |
| 9. | | 409 | 9.58 / 10.00 | 10.16 | 10.19 | 10.26 | 70.34 |
| 10. | | 461 | 10.13 / 10.10 | 10.29 | 10.30 | 10.37 | 78.75 |
| 11. | | 462 | 10.27 / 10.25 | 10.41 | 10.41 | 10.50 | 87.16 |
| 12. | | 424 | 10.35 / 10.36 | 10.54 | 10.55 | 11.01 | 94.80 |
| 13. | | 433 | 10.41 / 10.40 | 10.55 | 11:01 | 11.08 | 101.69 |
| 14 | | 414 | 10.51 / 10.56 | 11.06 | 11:07 | 11.15 | 109.33 |
| 15 | | 432 | 10.58 / 11.00 | 11.16 | 11:17 | 11.24 | 116.98 |
| 16 | | 460 | 11.05 / 11.05 | 11.19 | 11:23 | 11.31 | 125.39 |
| 17 | | 430 | 11.13 / 11:10 | 11.23 | 11.30 | 11.37 | 133.03 |
| 18 | | 409 | 11.19 / 11.15 | 11.35 | 11.37 | 12.07 | 140.68 |
| 19 | | 461 | 11.27 / 11.25 | 11.40 | 12.07 | 12.13 | 149.09 |
| 20 | | 462 | 11.34 / 11.35 | 11.55 | 12.12 | 12.21 | 157.50 |
| 21 | | 424 | 11.49 / 11.42 | 12.11 | 12.20 | 12.29 | 165.14 |
| ~~22~~ | ~~433~~ | ~~433~~ | ~~12.08 / 12.10~~ | ~~12.11~~ | ~~12.29~~ | | ~~179.67~~ |
| | | ~~414~~ | ~~12.08 / 12.10~~ | ~~12.19~~ | | | ~~179.67~~ |
| 22 | | 433 | 11.56 / 11.55 | 12.11 | 12.29 | 12.34 | 172.02 |
| 23 | | 414 | 12.08 / 12.10 | 12.19 | 12.34 | 12.43 | 179.67 |
| 24 | | 432 | 12.58 / 12.53 | 01.10 | 01.10 | 01.19 | 187.32 |
| 25 | | 461 | 01.39 / 01.30 | 01.50 | 01.50 | 01.56 | 197.26 |
| | | | | | | | |

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Note: Production Time:
8:56 / 8:50 means
8:56 is the production/batching time
8:50 is the departure from batching time

??? departure time is earlier than production time?
Ans: that is what is in the ticket

187.32
9.94
197.26

**Table C-12. Bridge S06 of 82194 Ambient Conditions**

**Project:** **Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

Bridge ID: I-75 over Fort Date: Aug 19-02 Recorder: Cerissa & Reep

| Time | | Ambient Temperature | Ambient Moisture | Wind Speed |
|---|---|---|---|---|
| 9:10pm | D | 66°F | 66% | |
| | A | 60°F | 54% | |
| 9:20 | D | 66°F | 65% | |
| | A | 60°F | 56% | |
| 9:30 | D | 67°F | 66% | |
| | A | 62°F | 55% | |
| 9:40 | D | 66°F | 66% | |
| | A | 61°F | 54% | |
| 9:50 | D | 66°F | 66% | |
| | A | 60°F | 57% | |
| 10:00 | D | 66°F | 66% | |
| | A | 60°F | 60% | |
| 10:10 | D | 65°F | 68% | |
| | A | 58°F | 61% | |
| 10:20 | D | 66°F | 67% | |
| | A | 62°F | 54% | |
| 10:30 | D | 68°F | 61% | |
| | A | 62°F | 56% | |
| 10:40 | D | 69°F | 60% | |
| | A | 60°F | 54% | |
| 10:50 | D | 69°F | 62% | |
| | A | 62°F | 54% | |
| 11:00 | D | 68°F | ~~[illegible]~~% 61% | |
| | A | 60°F | 53% | |
| 11:10 | D | 65°F | 68% | |
| | A | 58°F | 60% | |
| 11:20 | D | 63°F | 76% | |
| | A | 56°F | 62% | |
| 11:30 | D | 66°F | 76% | |
| | A | 64°F | 58% | |

D: Digital. A: Analog

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**Table C-12. Bridge S06 of 82194 Ambient Conditions (Contd.)**

**Project:** **Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

Michigan Foundation Concrete
~~2 72202~~
(734) 2829104
Jerry. Mix Design Ask Jerry

Bridge ID: I-75 over Fort Date: Aug 19-02 Recorder: Recep

| Time | | Ambient Temperature | Ambient Moisture | Wind Speed |
|---|---|---|---|---|
| 11:40 | D | 67 °F | 68% | |
| | A | 62 °F | 56% | |
| 11:50 | D | 66 °F | 70% | |
| | A | 60 °F | 48% | |
| 12:00 | D | 63 °F | 75% | |
| | A | 56 °F | 62% | |
| 12:10 | D | 62 °F | 80% | |
| | A | 56 °F | 64% | |
| 12:20 | D | 61 °F | 83% | |
| | A | 56 °F | 70% | |
| 12:30 | D | 61 °F | 85% | |
| | A | 54 °F | 68% | |
| 12:40 | D | 60 °F | 85% | |
| | A | 54 °F | 70% | |
| 12:50 | D | 60 °F | 86% | |
| | A | 54 °F | 70% | |
| 1:00 | D | 60 °F | 86% | |
| | A | 54 °F | 70% | |
| 1:10 | D | 60 °F | 87% | |
| | A | 54 °F | 70% | |
| 1:20 | D | 60 °F | 88% | |
| | A | 54 °F | 70% | |
| 1:30 | D | 60 °F | 90% | |
| | A | 54 °F | 72% | |
| 1:40 | D | 59 °F | 92% | |
| | A | 54 °F | 72% | |
| 1:50 | D | 59 °F | 94% | |
| | A | 54 °F | 72% | |
| 2:00 | D | 59 °F | 93% | |
| | A | 54 °F | 72% | |

D: Digital. A: Analog

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**Table C-12. Bridge S06 of 82194 Ambient Conditions (Contd.)**

**Project:** **Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

Bridge ID: I-75 over Fort Date: July 20-02 Recorder: Reep

| Time | | Ambient Temperature | Ambient Moisture | Wind Speed |
|---|---|---|---|---|
| 2:10 a.m | D | 59°F | 93% | |
| | A | 54°F | 72% | |
| 2:20 a.m | D | 59°F | 94% | |
| | A | 54° | 72% | |
| 2:30 a.m | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |
| | D | | | |
| | A | | | |

D: Digital. A: Analog

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**Table C-13. Bridge S26 of 50111 Deck Construction**

**Project:** **Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

**DECK CONCRETING**

Bridge ID: I-94 over Metro

Date: 09/16/2002 Recorder: Upendra Pandla

| | Concreting | Leveling | Lines | Curing | Burlap |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | Start: 9:04 | Start: 9:23 | S: 9:42 | S: 9:55 | |
| 3 | F: 9:36 | F: 9:50 | F: 9:53 | F: 10:05 | |
| 4 | Start: 9:17 | Start: 9:35 | S: 9:55 | S: 10:05 | |
| 5 | F: 9:40 | F: 9:55 | F: 9:56 | F: 10:10 | |
| 6 | Start 9:30 | S: 9:35 | S: 9:58 | S: 10:15 | |
| 7 | F: 9:44 | F: 9:57 | F: 10:10 | F: 10:20 | |
| 8 | Start 9:31 | S: 9:50 | S: 10:10 | S: 10:25 | |
| 9 | F: 9:58 | F: 10:00 | F: 10:25 | F: 10:30 | |
| 10 | | | | | |
| 11 | Start: 10:00 | S: 10:00 | S: 10:30 | S: 10:30 | |
| 12 | F: 10:15 | F: 10:30 | F: 10:35 | F: 10:40 | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |
| 26 | | | | | |
| 27 | | | | | |
| 28 | | | | | |

S: Start. F: Finish

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Pump Hose Stop: 9:23 Start: 9:25

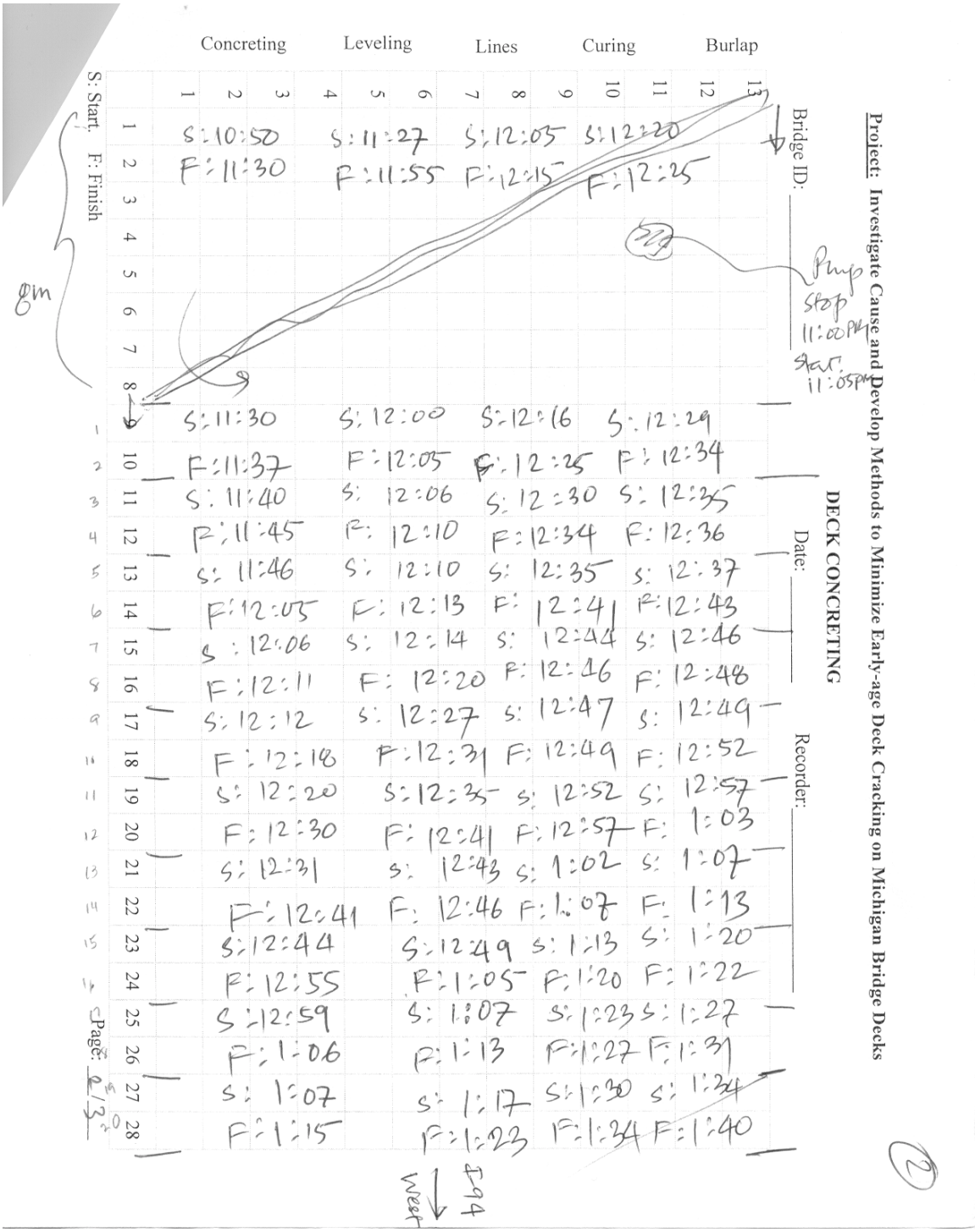
2m

8m

8m

I-94 East

**Table C-13. Bridge S26 of 50111 Deck Construction (Contd.)**



Project: Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

DECK CONCRETING

Bridge ID: _____ Date: _____ Recorder: _____

S: Start. F: Finish

| | Concreting | Leveling | Lines | Curing | Burlap |
|---|---|---|---|---|---|
| 1 | S:10:50 | S:11:27 | S:12:05 | S:12:20 | |
| 2 | F:11:30 | F:11:55 | F:12:15 | F:12:25 | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | S:11:30 | S:12:00 | S:12:16 | S:12:29 | |
| 10 | F:11:37 | F:12:05 | F:12:25 | F:12:34 | |
| 11 | S:11:40 | S:12:06 | S:12:30 | S:12:35 | |
| 12 | F:11:45 | F:12:10 | F:12:34 | F:12:36 | |
| 13 | S:11:46 | S:12:10 | S:12:35 | S:12:37 | |
| 14 | F:12:05 | F:12:13 | F:12:41 | F:12:43 | |
| 15 | S:12:06 | S:12:14 | S:12:44 | S:12:46 | |
| 16 | F:12:11 | F:12:20 | F:12:46 | F:12:48 | |
| 17 | S:12:12 | S:12:27 | S:12:47 | S:12:49 | |
| 18 | F:12:18 | F:12:31 | F:12:49 | F:12:52 | |
| 19 | S:12:20 | S:12:35 | S:12:52 | S:12:57 | |
| 20 | F:12:30 | F:12:41 | F:12:57 | F:1:03 | |
| 21 | S:12:31 | S:12:43 | S:1:02 | S:1:07 | |
| 22 | F:12:41 | F:12:46 | F:1:07 | F:1:13 | |
| 23 | S:12:44 | S:12:49 | S:1:13 | S:1:20 | |
| 24 | F:12:55 | F:1:05 | F:1:20 | F:1:22 | |
| 25 | S:12:59 | S:1:07 | S:1:23 | S:1:27 | |
| 26 | F:1:06 | F:1:13 | F:1:27 | F:1:31 | |
| 27 | S:1:07 | S:1:17 | S:1:30 | S:1:34 | |
| 28 | F:1:15 | F:1:23 | F:1:34 | F:1:40 | |

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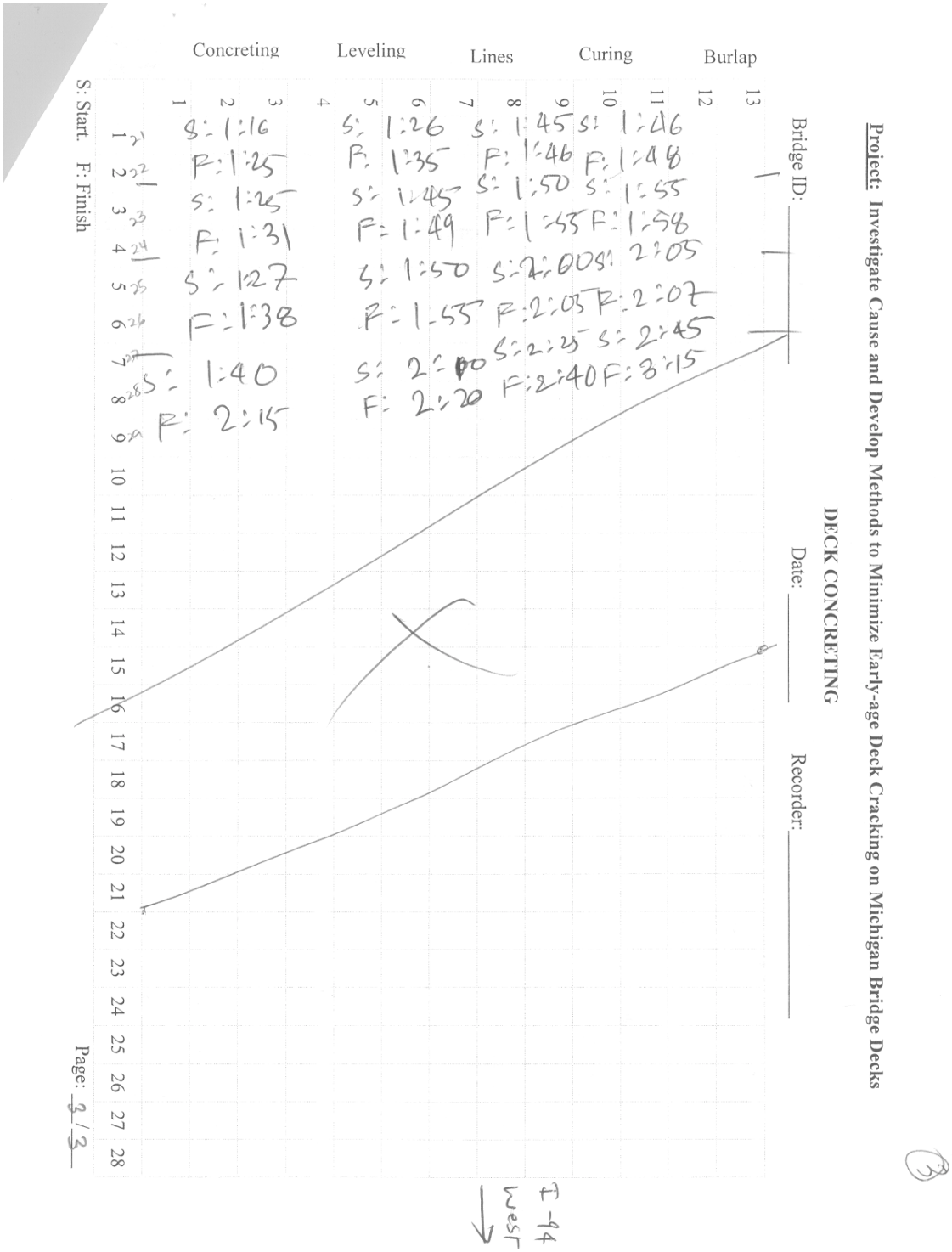
**Table C-13. Bridge S26 of 50111 Deck Construction (Contd.)**



**Project: Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

**DECK CONCRETING**

Bridge ID: _____ Date: _____ Recorder: _____

| | Concreting | Leveling | Lines | Curing | Burlap |
|---|---|---|---|---|---|
| 1 | S: 1:16 | S: 1:26 | S: 1:45 | S: 1:46 | |
| 2 | F: 1:25 | F: 1:35 | F: 1:46 | F: 1:48 | |
| 3 | S: 1:25 | S: 1:45 | S: 1:50 | S: 1:55 | |
| 4 | F: 1:31 | F: 1:49 | F: 1:55 | F: 1:58 | |
| 5 | S: 1:27 | S: 1:50 | S: 2:00 | S: 2:05 | |
| 6 | F: 1:38 | F: 1:55 | F: 2:03 | F: 2:07 | |
| 7 | S: 1:40 | S: 2:00 | S: 2:25 | S: 2:45 | |
| 8 | F: 2:15 | F: 2:20 | F: 2:40 | F: 3:15 | |

S: Start. F: Finish

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I-94 West

**Table C-14. Bridge S26 of 50111 Ticket Information**

**Project:** Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

**TICKET INFORMATION**

Bridge ID: I-94 Over Metro Date: 09/16/02 Recorder: Reynaldo

| | Company Name | Truck # | Production Time (Concrete Plant) | Arrival Time (Casting Site) | Unloading Time | |
|---|---|---|---|---|---|---|
| | | | | | Start | Finish |
| 1. | Metzen Concr. | 82 | 20.45 | 8:59 | 9.05 | 9:11 |
| 2. | | 97 | 8.58 | 9.12 | 9.12 | 9.19 |
| 3 | | 94 | 9.02 | 9.18 | 9.19 | 9.29 |
| 4 | | 93 | 9.11 | 9.27 | 9.30 | 9.36 |
| 5 | | 90 | 9.13 | 9.28 | 9.36 | 9.44 |
| 6 | | 92 | 9.16 | 9.30 | 9.44 | 9.51 |
| 7 | | 44 | 9.14 | 9.33 | 9.52 | 10.12 |
| 8 | | 87 | 9.48 | 10.01 | 10.12 | 10.19 |
| 9 | | ↳ transferred to other side of bridge | | | 10.44 | 10.51 |
| 10 | | 82 | 10.46 | 10.59 | 10.59 | 11.06 |
| 11 | | 97 | 10.50 | 11.04 | 11.09 | 11.16 |
| 12 | | 94 | 10.56 | 11.10 | 11.16 | 11.28 |
| 13 | | 93 | 11.02 | 11.15 | 11.28 | 11.33 |
| 14 | | 90 | 11.04 | 11.16 | 11.33 | 11.38 |
| 15 | | 92 | 11.11 | 11.25 | 11.38 | 11.44 |
| 16 | | 44 | 11.20 | 11.37 | 11.44 | 12.01 |
| 17 | | 87 | 11.31 | 11.45 | 12.00 | 12.12 |
| 18 | | 82 | 11.47 | 12.01 | 12.02 | 12.08 |
| 19 | | 97 | 11.53 | 12.08 | 12.08 | 12.15 |
| 20 | | 94 | 12.01 | 12.16 | 12.17 | 12.26 |
| 21 | | 93 | 12.13 | 12.20 | 12.26 | 12.33 |
| 22 | | 90 | 12.15 | 12.27 | 12.33 | 12.38 12.47 |
| 23 | | 92 | 12.24 | 12.39 | 12.39 | 12.45 |
| 24 | | 44 | 12.38 | 12.53 | ~~[illegible]~~ | 12.55 |
| 25 | | 87 | 12.41 | 12.56 | 12.56 | 01.05 |
| 26 | | 82 | 12.54 | 01.05 | 01.06 | 01.12 |
| 27 | | 97 | 12.56 | 01.08 | 01.12 | 01.16 |
| 28 | | 94 | 12.58 | 01.11 | 01.16 | 01.25 |
| 29 | | 93 | 01.04 | 01.21 | 01.25 | 01.30 |

Page: 1/2

**Table C-14. Bridge S26 of 50111 Ticket Information (Contd.)**

**Project:** **Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

**TICKET INFORMATION**

Bridge ID: I-94 over Metro Date: 09/16/02 Recorder: Reynaldo

| | Company Name | Truck # | Production Time (Concrete Plant) | Arrival Time (Casting Site) | Unloading Time | |
|---|---|---|---|---|---|---|
| | | | | | Start | Finish |
| 30 | | 90 | 01.15 | 01.30 | 01.31 | 01.37 |
| 31 | | 92 | 01.18 | 01.32 | 01.37 | 01.44 |
| 32 | | 44 | 01.28 | 01.44 | 01.45 | 01.56 |
| 33 | | 82 | 02.00 | 02.12 | 02.12 | 02.16 |

Page: 2/2

**Table C-15. Bridge S26 of 50111 Ambient Conditions**

**Project:** **Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

Bridge ID: I-94 over Metropolitan Parkway Date: 09/16 & 09/17 Recorder: Okan Icpul

| Time | | Ambient Temperature | Ambient Moisture | Wind Speed |
|---|---|---|---|---|
| 20.45 | D | 62 | 61 % | |
| | A | 59.6 | 71 % | |
| SAMPLING START 55 | D | 62 | 60 % | |
| | A | 60.7 | 72 % | |
| 21 05 | D | 62 | 63 % | Concrete |
| | A | 60.3 | 76 % | Air 7%, 80F, 4in slump |
| 15 | D | 62 | 62 % | II. pump set up |
| | A | 60.1 | 78 % | |
| 25 | D | 63 | 61 | |
| | A | 59.9 | 78% | |
| SAMPLING FINISH 35 | D | 62 | 63 | |
| | A | 60.7 | 78 | |
| 45 | D | 62 | 64 | |
| | A | 60.5 | 76 | |
| 55 | D | 63 | 63 | |
| | A | 60.8 | 77 | |
| 22 05 | D | 63.0 | 64 | |
| | A | 62.1 | 71 | |
| 15 | D | 65 | 66 | |
| | A | 68.2 | 61 | |
| 25 | D | 67 | 64 | |
| | A | 71.5 | 62 | |
| 35 | D | 63 | 63 | |
| | A | 67 | 64 | |
| 45 | D | 59 | 66 | |
| | A | 57.4 | 75 | |
| 55 | D | 56 | 69 | |
| | A | 55 | 82 | |
| 23 05 | D | 56 | 78 | |
| | A | 55.6 | 84 | |

D: Digital. A: Analog

Page: 1 /____

**Table C-15. Bridge S26 of 50111 Ambient Conditions (Contd.)**

**Project:** **Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

Bridge ID: I-94 over Metropark Way Date: 09/16 & 09/17 Recorder: upul

| Time | | Ambient Temperature | Ambient Moisture | Wind Speed |
|---|---|---|---|---|
| 23:15 | D | 55 | 78 | |
| | A | 54.2 | 88 | |
| 23:25 | D | 54 | 81 | |
| | A | 53.1 | 89 | |
| :35 | D | 56 | 79 | |
| | A | 54 | 88 | |
| :45 | D | 54 | 83 | |
| | A | 52.6 | 89 | |
| :55 | D | 54 | 85 | |
| | A | 52.6 | 91 | |
| 24:05 | D | 53 | 87 | |
| | A | 52.2 | 91 | |
| :15 | D | 53 | 89 | |
| | A | 52.2 | 92 | |
| :25 | D | 53 | 88 | |
| | A | 51.8 | 93 | |
| :35 | D | 53 | 88 | |
| | A | 52 | 94 | |
| :45 | D | 53 | 92 | |
| | A | 51.7 | 99 | |
| :55 | D | 53 | 94 | |
| | A | 52 | 99 | |
| 01:05 | D | 53 | HH | |
| | A | 53 | 99 | |
| 01:15 | D | 55 | HH | |
| | A | 54 | 99 | |
| :25 | D | 55 | HH | |
| | A | 53.6 | 99 | |
| :35 | D | 54 | 94 | |
| | A | 53.3 | 99 | |

D: Digital. A: Analog

Page: 2 /____

**Table C-15. Bridge S26 of 50111 Ambient Conditions (Contd.)**

**Project: Investigate Cause and Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks**

Bridge ID: f-94 over metropolitan Parkway Date: 09/1~~0~~ & 09/17 Recorder: upul

| Time | | Ambient Temperature | Ambient Moisture | Wind Speed |
|---|---|---|---|---|
| 01:45 | D | 53 | 94 | |
| | A | 52.7 | 99 | |
| :55 | D | 54 | HH | |
| | A | 54.5 | 99 | |
| 02:05 | D | 54 | HH | |
| | A | 54 | 99 | |
| :15 | D | 54 | HH | |
| | A | 54.3 | 99 | |
| :25 | D | 53 | HH | |
| | A | 54 | 99 | |
| :35 | D | | | |
| | A | | | |
| :45 | D | | | |
| | A | | | |
| :55 | D | | | |
| | A | | | |
| 02:05 | D | | | |
| | A | | | |
| :15 | D | | | |
| | A | | | |
| :25 | D | | | |
| | A | | | |
| :35 | D | | | |
| | A | | | |
| :45 | D | | | |
| | A | | | |
| :55 | D | | | |
| | A | | | |
| 03:05 | D | | | |
| | A | | | |

D: Digital. A: Analog Page: 3 /____

# Cement Mill - Test Report

**Table C-16. Cement Mill Report from May 1 to 31, 2003**

LAFARGE NORTH AMERICA

Cement

# CEMENT MILL TEST REPORT

CONSIGNEE:

| | |
|---|---|
| Date: | Jun-03 |
| Plant: | ALPENA |
| Cement Type: | I |
| Manufacture Period: | May 1 to 31 |

| PHYSICAL DATA | | CHEMICAL DATA (C-114) | Percent |
|---|---|---|---|
| Specific Surface (Blaine) (C-204) | | Silicon Dioxide (SiO2) | 20.4 |
| (sq. cm./gm.) | 3630 | | |
| (sq. m./kg.) | 363 | Aluminum Oxide (Al2O3) | 4.8 |
| Percent Passing 325 Mesh (C-430) | 95.8 | Ferric Oxide (Fe2O3) | 2.7 |
| Compressive Strength (psi) (C-109) | | Calcium Oxide (CaO) | 65.5 |
| Mortar Cubes | | Magnesium Oxide (MgO) | 2.2 |
| 1 day | 2170 | | |
| 3 day | 3760 | Sulphur Trioxide (SO3) | 2.5 |
| 7 day | 4670 | | |
| 28 day | 5600 | Loss on Ignition | 1.4 |
| Vicat Setting Time (C-191) | | Insoluble Residue | 0.42 |
| Initial (min.) | 110 | | |
| Final (min.) | 220 | Free Lime | 1.42 |
| Air Content (%) (C-185) | 5.9 | Tricalcium Silicate (C3S) | 69 |
| Autoclave Expansion (%) (C-151) | 0.09 | Tricalcium Aluminate (C3A) | 8 |
| | | Total Alkali as Sodium Oxide | 0.50 |

CERTIFIED BY: _____
Quality Coordinator – Alpena

We hereby certify that this cement complies with current ASTM C 150-02 and AASHTO M 85-00 specifications.

GREAT LAKES REGION – ALPENA PLANT
1435 Ford Avenue, PO Box 396, Alpena, MI 49707
OFFICE: (989) 354-4171 FAX: (989) 354-2223
Web: www.lafargenorthamerica.com

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**Table C-17. Cement Mill Report from June 1 to 30, 2003**

LAFARGE NORTH AMERICA

Cement

# CEMENT MILL TEST REPORT

CONSIGNEE:

| | |
|---|---|
| Date: | Jul-03 |
| Plant: | ALPENA |
| Cement Type: | I |
| Manufacture Period: | June 1 to 30 |

| PHYSICAL DATA | | CHEMICAL DATA (C-114) | Percent |
|---|---|---|---|
| Specific Surface (Blaine) (C-204) | | Silicon Dioxide (SiO2) | 20.7 |
| (sq. cm./gm.) | 3690 | | |
| (sq. m./kg.) | 369 | Aluminum Oxide (Al2O3) | 4.7 |
| Percent Passing 325 Mesh (C-430) | 96.1 | Ferric Oxide (Fe2O3) | 2.6 |
| Compressive Strength (psi) (C-109) | | Calcium Oxide (CaO) | 65.7 |
| Mortar Cubes | | Magnesium Oxide (MgO) | 2.2 |
| 1 day | 2200 | | |
| 3 day | 3790 | Sulphur Trioxide (SO3) | 2.5 |
| 7 day | 4710 | | |
| 28 day | 5690 | Loss on Ignition | 1.4 |
| Vicat Setting Time (C-191) | | Insoluble Residue | 0.26 |
| Initial (min.) | 115 | | |
| Final (min.) | 225 | Free Lime | 1.32 |
| Air Content (%) (C-185) | 5.7 | Tricalcium Silicate (C3S) | 68 |
| Autoclave Expansion (%) (C-151) | 0.02 | Tricalcium Aluminate (C3A) | 8 |
| | | Total Alkali as Sodium Oxide | 0.48 |

CERTIFIED BY: _____
Quality Coordinator – Alpena

We hereby certify that this cement complies with current ASTM C 150-02 and AASHTO M 85-00 specifications.

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**Table C-18. Cement Mill Report from July 1 to 31, 2003**

LAFARGE NORTH AMERICA

Cement

# CEMENT MILL TEST REPORT

CONSIGNEE:

| | |
|---|---|
| Date: | Aug-03 |
| Plant: | ALPENA |
| Cement Type: | I |
| Manufacture Period: | July 1 to 31 |

| PHYSICAL DATA | | CHEMICAL DATA (C-114) | Percent |
|---|---|---|---|
| Specific Surface (Blaine) (C-204) | | Silicon Dioxide (SiO2) | 20.7 |
| (sq. cm./gm.) | 3630 | | |
| (sq. m./kg.) | 363 | Aluminum Oxide (Al2O3) | 4.7 |
| Percent Passing 325 Mesh (C-430) | 94.8 | Ferric Oxide (Fe2O3) | 2.6 |
| Compressive Strength (psi) (C-109) | | Calcium Oxide (CaO) | 65.6 |
| Mortar Cubes | | Magnesium Oxide (MgO) | 2.3 |
| 1 day | 2130 | | |
| 3 day | 3670 | Sulphur Trioxide (SO3) | 2.6 |
| 7 day | 4530 | | |
| 28 day | 5790 | Loss on Ignition | 1.6 |
| Vicat Setting Time (C-191) | | Insoluble Residue | 0.31 |
| Initial (min.) | 115 | | |
| Final (min.) | 225 | Free Lime | 1.30 |
| Air Content (%) (C-185) | 6.0 | Tricalcium Silicate (C3S) | 67 |
| Autoclave Expansion (%) (C-151) | 0.02 | Tricalcium Aluminate (C3A) | 8 |
| | | Total Alkali as Sodium Oxide | 0.49 |

CERTIFIED BY: _____
Quality Coordinator – Alpena

We hereby certify that this cement complies with current ASTM C 150-02 and AASHTO M 85-00 specifications.

GREAT LAKES REGION – ALPENA PLANT
[illegible]

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**Table C-19. Cement Mill Report from August 1 to 31, 2003**

LAFARGE NORTH AMERICA

Cement

# CEMENT MILL TEST REPORT

CONSIGNEE:

| | |
|---|---|
| Date: | Sep-03 |
| Plant: | ALPENA |
| Cement Type: | I |
| Manufacture Period: | Aug 1 to 31 |

| PHYSICAL DATA | | CHEMICAL DATA (C-114) | Percent |
|---|---|---|---|
| Specific Surface (Blaine) (C-204) | | Silicon Dioxide (SiO2) | 20.6 |
| (sq. cm./gm.) | 3620 | | |
| (sq. m./kg.) | 362 | Aluminum Oxide (Al2O3) | 4.7 |
| Percent Passing 325 Mesh (C-430) | 96.1 | Ferric Oxide (Fe2O3) | 2.6 |
| Compressive Strength (psi) (C-109) | | Calcium Oxide (CaO) | 65.7 |
| Mortar Cubes | | Magnesium Oxide (MgO) | 2.2 |
| 1 day | 2140 | | |
| 3 day | 3650 | Sulphur Trioxide (SO3) | 2.5 |
| 7 day | 4520 | | |
| 28 day | 5590 | Loss on Ignition | 1.4 |
| Vicat Setting Time (C-191) | | Insoluble Residue | 0.28 |
| Initial (min.) | 115 | | |
| Final (min.) | 225 | Free Lime | 1.39 |
| Air Content (%) (C-185) | 6.2 | Tricalcium Silicate (C3S) | 68 |
| Autoclave Expansion (%) (C-151) | 0.03 | Tricalcium Aluminate (C3A) | 8 |
| | | Total Alkali as Sodium Oxide | 0.52 |

CERTIFIED BY: _
Quality Coordinator – Alpena

We hereby certify that this cement complies with current ASTM C 150-02 and AASHTO M 85-00 specifications.

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**APPENDIX D**

# Schedule for Laboratory Testing

| Activity ID | Activity Description | Early Start | Early Finish |
|---|---|---|---|
| DS 100 | Deck Sampling-1 (30 6x12, 24 4x8) | AUG-14-02A | |
| DS 101 | Removing Specimens And Curing | AUG-14-02A | AUG-17-02A |
| DS 103 | Curing Specimens (7 Days) | AUG-14-02A | AUG-21-02A |
| DS 104 | Sample Ends Cutting (26 6x12, 12 4x8) | AUG-14-02A | AUG-17-02A |
| DS 105 | Curing Specimens (28 Days) | AUG-14-02A | SEP-11-02A |
| DS 110 | 3 Days Strength Testing | AUG-17-02A | AUG-17-02A |
| DS 111 | 3 Days Modulus of Elasticity Testing | AUG-17-02A | AUG-17-02A |
| DS 112 | 3 Days UPV testing | AUG-17-02A | AUG-17-02A |
| DS 200 | Deck Sampling-1 (30 6x12, 24 4x8) | AUG-19-02A | |
| DS 201 | Removing Specimens And Curing | AUG-19-02A | AUG-22-02A |
| DS 202 | Sample Ends Cutting (4 6x12, 12 4x8) | AUG-19-02A | AUG-22-02A |
| DS 203 | Curing Specimens (7 Days) | AUG-19-02A | AUG-26-02A |
| DS 204 | Sample Ends Cutting (26 6x12, 12 4x8) | AUG-19-02A | AUG-22-02A |
| DS 205 | Curing Specimens (28 Days) | AUG-19-02A | SEP-16-02A |
| DS 210 | 3 Days Strength Testing | AUG-19-02A | AUG-19-02A |
| DS 211 | 3 Days Modulus of Elasticity Testing | AUG-19-02A | AUG-19-02A |
| DS 212 | 3 Days UPV testing | AUG-19-02A | AUG-19-02A |
| DS 102 | Sample Ends Cutting (4 6x12, 12 4x8) | AUG-21-02A | AUG-24-02A |
| DS 120 | 7 Days Strength Testing | AUG-21-02A | AUG-21-02A |
| DS 121 | 7 Days Modulus of Elasticity Testing | AUG-21-02A | AUG-21-02A |
| DS 122 | 7 Days UPV Testing | AUG-21-02A | AUG-21-02A |
| DS 220 | 7 Days Strength Testing | AUG-26-02A | AUG-26-02A |
| DS 221 | 7 Days Modulus of Elasticity Testing | AUG-26-02A | AUG-26-02A |
| DS 222 | 7 Days UPV Testing | AUG-26-02A | AUG-26-02A |
| DS 106 | Ambient Laboratory Air (56 Days) | SEP-11-02A | OCT-08-02A |
| DS 107 | Ambient Laboratory Air (90 Days) | SEP-11-02A | NOV-11-02A |
| DS 130 | 28 Days Strength Testing | SEP-11-02A | SEP-11-02A |
| DS 131 | 28 Days Modulus of Elasticity | SEP-11-02A | |
| DS 132 | 28 Days UPV Testing | SEP-11-02A | |
| DS 133 | 28 Days Permeability Testing | SEP-11-02A | |
| DS 134 | 28 Days RCPT Testing | SEP-11-02A | |
| DS 135 | 28 Days Absorption Testing | SEP-11-02A | |
| DS 302 | Sample Ends Cutting (4 6x12, 12 4x8) | SEP-12-02A | SEP-15-02A |
| DS 300 | Deck Sampling-1 (30 6x12, 24 4x8) | SEP-15-02A | |
| DS 301 | Removing Specimens And Curing | SEP-15-02A | SEP-18-02A |

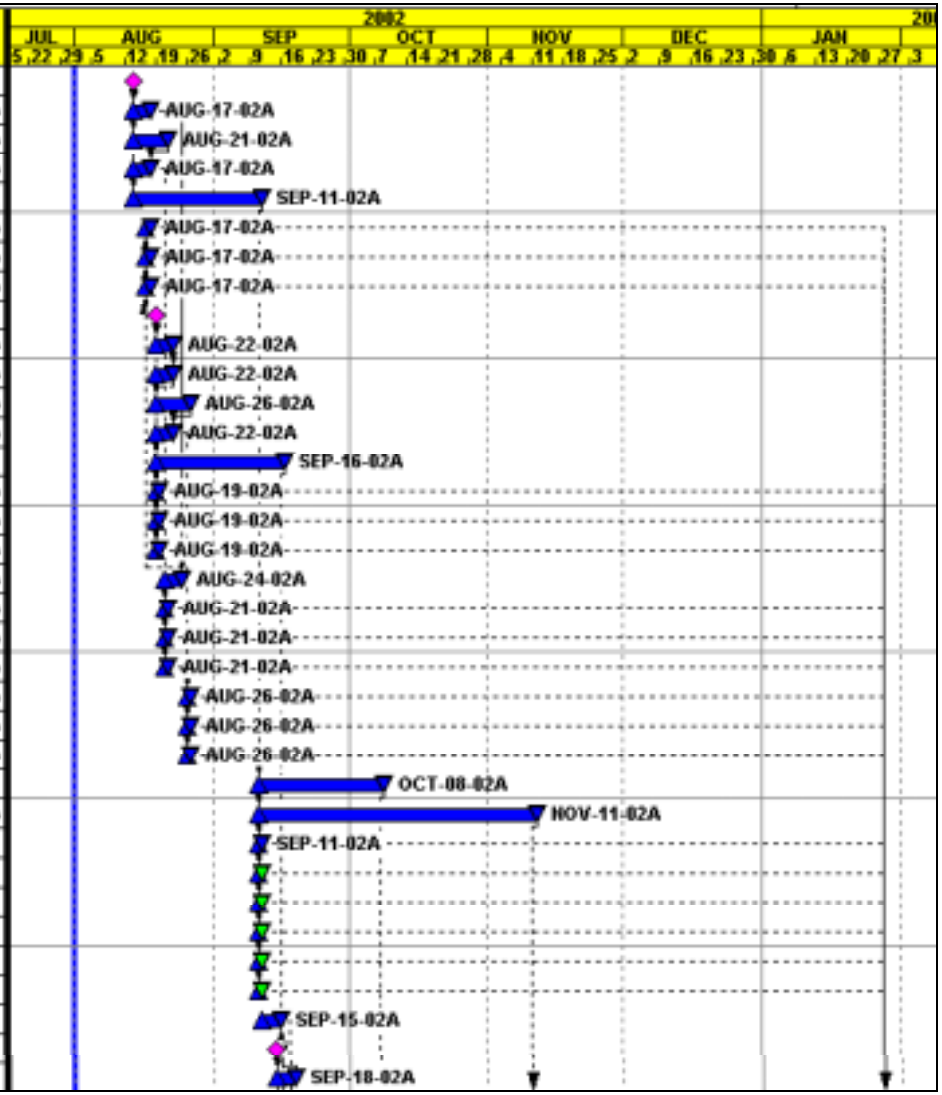


**Figure D-1. Schedule for laboratory testing**

| Activity ID | Activity Description | Early Start | Early Finish |
|---|---|---|---|
| DS 303 | Curing Specimens (7 Days) | SEP-15-02A | SEP-22-02A |
| DS 304 | Sample Ends Cutting (26 6x12, 12 4x8) | SEP-15-02A | SEP-18-02A |
| DS 305 | Curing Specimens (28 Days) | SEP-15-02A | OCT-13-02A |
| DS 206 | Ambient Laboratory Air (56 Days) | SEP-16-02A | OCT-13-02A |
| DS 207 | Ambient Laboratory Air (90 Days) | SEP-16-02A | NOV-16-02A |
| DS 230 | 28 Days Strength Testing | SEP-16-02A | SEP-16-02A |
| DS 231 | 28 Days Modulus of Elasticity | SEP-16-02A | |
| DS 232 | 28 Days UPV Testing | SEP-16-02A | |
| DS 233 | 28 Days Permeability Testing | SEP-16-02A | |
| DS 234 | 28 Days RCPT Testing | SEP-16-02A | |
| DS 235 | 28 Days Absorption Testing | SEP-16-02A | |
| DS 310 | 3 Days Strength Testing | SEP-18-02A | SEP-18-02A |
| DS 311 | 3 Days Modulus of Elasticity Testing | SEP-18-02A | SEP-18-02A |
| DS 312 | 3 Days UPV testing | SEP-18-02A | SEP-18-02A |
| DS 320 | 7 Days Strength Testing | SEP-22-02A | SEP-22-02A |
| DS 321 | 7 Days Modulus of Elasticity Testing | SEP-22-02A | SEP-22-02A |
| DS 322 | 7 Days UPV Testing | SEP-22-02A | SEP-22-02A |
| DS 400 | Deck Sampling-1 (30 6x12, 24 4x8) | SEP-30-02A | |
| DS 401 | Removing Specimens And Curing | SEP-30-02A | OCT-03-02A |
| DS 402 | Sample Ends Cutting (4 6x12, 12 4x8) | SEP-30-02A | OCT-03-02A |
| DS 403 | Curing Specimens (7 Days) | SEP-30-02A | OCT-07-02A |
| DS 404 | Sample Ends Cutting (26 6x12, 12 4x8) | SEP-30-02A | OCT-03-02A |
| DS 405 | Curing Specimens (28 Days) | SEP-30-02A | OCT-28-02A |
| DS 410 | 3 Days Strength Testing | OCT-03-02A | OCT-03-02A |
| DS 411 | 3 Days Modulus of Elasticity Testing | OCT-03-02A | OCT-03-02A |
| DS 412 | 3 Days UPV testing | OCT-03-02A | OCT-03-02A |
| DS 420 | 7 Days Strength Testing | OCT-07-02A | OCT-07-02A |
| DS 421 | 7 Days Modulus of Elasticity Testing | OCT-07-02A | OCT-07-02A |
| DS 422 | 7 Days UPV Testing | OCT-07-02A | OCT-07-02A |
| DS 140 | 56 Days Strength Testing | OCT-08-02A | OCT-08-02A |
| DS 141 | 56 Days Modulus of Elasticity Testing | OCT-08-02A | OCT-08-02A |
| DS 142 | 56 Days UPV Testing | OCT-08-02A | |
| DS 143 | 56 Days Permeability Testing | OCT-08-02A | |
| DS 144 | 56 Days RCPT Testing | OCT-08-02A | |
| DS 145 | 56 Days Absorption Testing | OCT-08-02A | |

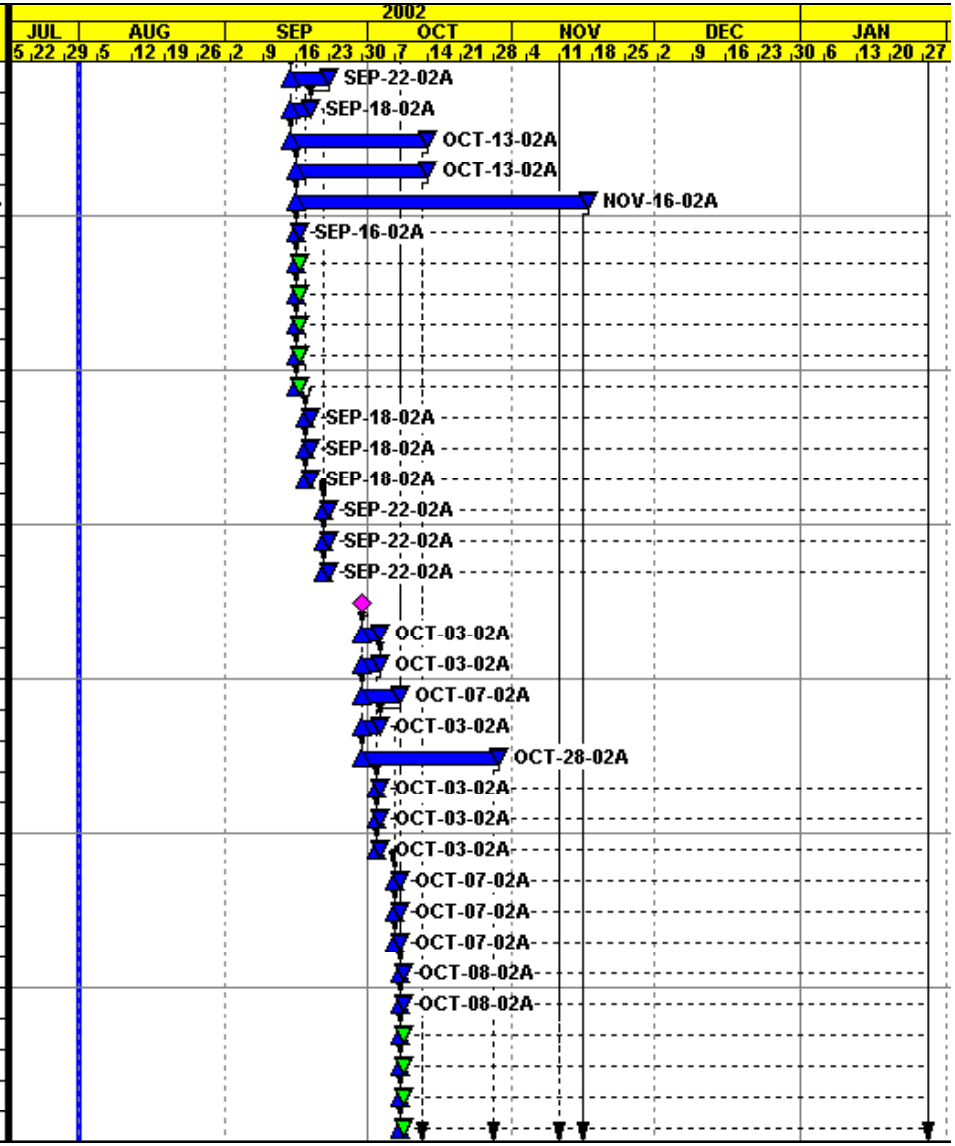


**Figure D-1. Schedule for laboratory testing (contd.)**

| Activity ID | Activity Description | Early Start | Early Finish |
|---|---|---|---|
| DS 240 | 56 Days Strength Testing | OCT-13-02A | OCT-13-02A |
| DS 241 | 56 Days Modulus of Elasticity Testing | OCT-13-02A | |
| DS 242 | 56 Days UPV Testing | OCT-13-02A | |
| DS 243 | 56 Days Permeability Testing | OCT-13-02A | |
| DS 244 | 56 Days RCPT Testing | OCT-13-02A | |
| DS 245 | 56 Days Absorption Testing | OCT-13-02A | |
| DS 306 | Ambient Laboratory Air (56 Days) | OCT-13-02A | NOV-09-02A |
| DS 307 | Ambient Laboratory Air (90 Days) | OCT-13-02A | DEC-13-02A |
| DS 330 | 28 Days Strength Testing | OCT-13-02A | OCT-13-02A |
| DS 331 | 28 Days Modulus of Elasticity | OCT-13-02A | |
| DS 332 | 28 Days UPV Testing | OCT-13-02A | |
| DS 333 | 28 Days Permeability Testing | OCT-13-02A | |
| DS 334 | 28 Days RCPT Testing | OCT-13-02A | |
| DS 335 | 28 Days Absorption Testing | OCT-13-02A | |
| DS 500 | Deck Sampling-1 (30 6x12, 24 4x8) | OCT-15-02A | |
| DS 501 | Removing Specimens And Curing | OCT-15-02A | OCT-18-02A |
| DS 502 | Sample Ends Cutting (4 6x12, 12 4x8) | OCT-15-02A | OCT-18-02A |
| DS 503 | Curing Specimens (7 Days) | OCT-15-02A | OCT-22-02A |
| DS 504 | Sample Ends Cutting (26 6x12, 12 4x8) | OCT-15-02A | OCT-18-02A |
| DS 505 | Curing Specimens (28 Days) | OCT-15-02A | NOV-12-02A |
| DS 510 | 3 Days Strength Testing | OCT-18-02A | OCT-18-02A |
| DS 511 | 3 Days Modulus of Elasticity Testing | OCT-18-02A | OCT-18-02A |
| DS 512 | 3 Days UPV testing | OCT-18-02A | OCT-18-02A |
| DS 520 | 7 Days Strength Testing | OCT-22-02A | OCT-22-02A |
| DS 521 | 7 Days Modulus of Elasticity Testing | OCT-22-02A | OCT-22-02A |
| DS 522 | 7 Days UPV Testing | OCT-22-02A | OCT-22-02A |
| DS 406 | Ambient Laboratory Air (56 Days) | OCT-28-02A | NOV-24-02A |
| DS 407 | Ambient Laboratory Air (90 Days) | OCT-28-02A | DEC-28-02A |
| DS 430 | 28 Days Strength Testing | OCT-28-02A | OCT-28-02A |
| DS 431 | 28 Days Modulus of Elasticity | OCT-28-02A | |
| DS 432 | 28 Days UPV Testing | OCT-28-02A | |
| DS 433 | 28 Days Permeability Testing | OCT-28-02A | |
| DS 434 | 28 Days RCPT Testing | OCT-28-02A | |
| DS 435 | 28 Days Absorption Testing | OCT-28-02A | |
| DS 340 | 56 Days Strength Testing | NOV-09-02A | NOV-09-02A |

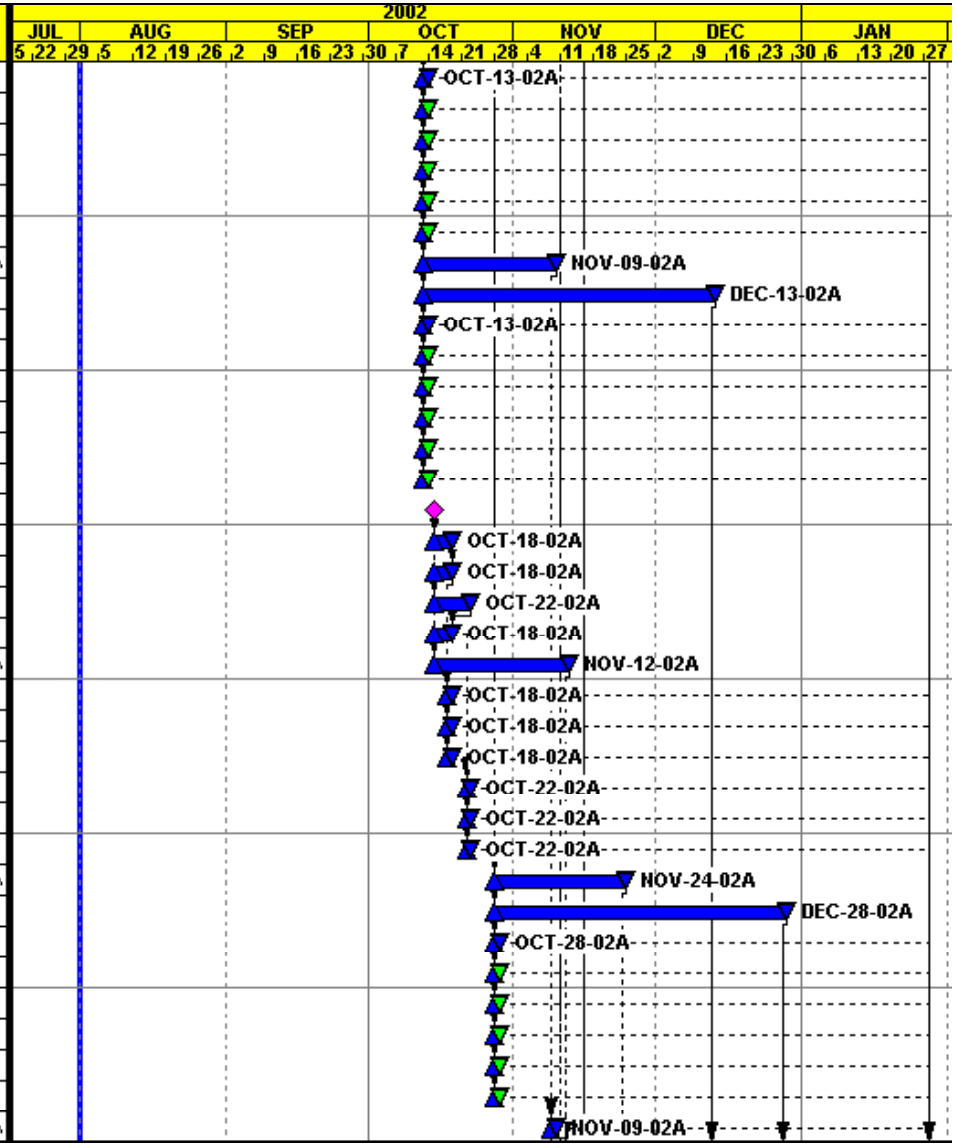


**Figure D-1. Schedule for laboratory testing (contd.)**

| Activity ID | Activity Description | Early Start | Early Finish |
|---|---|---|---|
| DS 341 | 56 Days Modulus of Elasticity Testing | NOV-09-02A | |
| DS 342 | 56 Days UPV Testing | NOV-09-02A | |
| DS 343 | 56 Days Permeability Testing | NOV-09-02A | |
| DS 344 | 56 Days RCPT Testing | NOV-09-02A | |
| DS 345 | 056 Days Absorption Testing | NOV-09-02A | |
| DS 150 | 090 Days Strength Testing | NOV-11-02A | NOV-11-02A |
| DS 151 | 90 Days Modulus of Elasticity Testing | NOV-11-02A | |
| DS 152 | 90 Days UPV Testing | NOV-11-02A | |
| DS 153 | 90 Days Permeability Testing | NOV-11-02A | |
| DS 154 | 90 Days RCPT Testing | NOV-11-02A | |
| DS 155 | 90 Days Absorption Testing | NOV-11-02A | |
| DS 506 | Ambient Laboratory Air (56 Days) | NOV-12-02A | DEC-09-02A |
| DS 507 | Ambient Laboratory Air (90 Days) | NOV-12-02A | JAN-12-03A |
| DS 530 | 28 Days Strength Testing | NOV-12-02A | NOV-12-02A |
| DS 531 | 28 Days Modulus of Elasticity | NOV-12-02A | |
| DS 532 | 28 Days UPV Testing | NOV-12-02A | |
| DS 533 | 28 Days Permeability Testing | NOV-12-02A | |
| DS 534 | 28 Days RCPT Testing | NOV-12-02A | |
| DS 535 | 28 Days Absorption Testing | NOV-12-02A | |
| DS 250 | 90 Days Strength Testing | NOV-16-02A | NOV-16-02A |
| DS 251 | 90 Days Modulus of Elasticity Testing | NOV-16-02A | |
| DS 252 | 90 Days UPV Testing | NOV-16-02A | |
| DS 253 | 90 Days Permeability Testing | NOV-16-02A | |
| DS 254 | 90 Days RCPT Testing | NOV-16-02A | |
| DS 255 | 90 Days Absorption Testing | NOV-16-02A | |
| DS 440 | 56 Days Strength Testing | NOV-24-02A | NOV-24-02A |
| DS 441 | 56 Days Modulus of Elasticity Testing | NOV-24-02A | |
| DS 442 | 56 Days UPV Testing | NOV-24-02A | |
| DS 443 | 56 Days Permeability Testing | NOV-24-02A | |
| DS 444 | 56 Days RCPT Testing | NOV-24-02A | |
| DS 445 | 56 Days Absorption Testing | NOV-24-02A | |
| DS 540 | 56 Days Strength Testing | DEC-09-02A | DEC-09-02A |
| DS 541 | 56 Days Modulus of Elasticity Testing | DEC-09-02A | |
| DS 542 | 56 Days UPV Testing | DEC-09-02A | |
| DS 543 | 56 Days Permeability Testing | DEC-09-02A | |

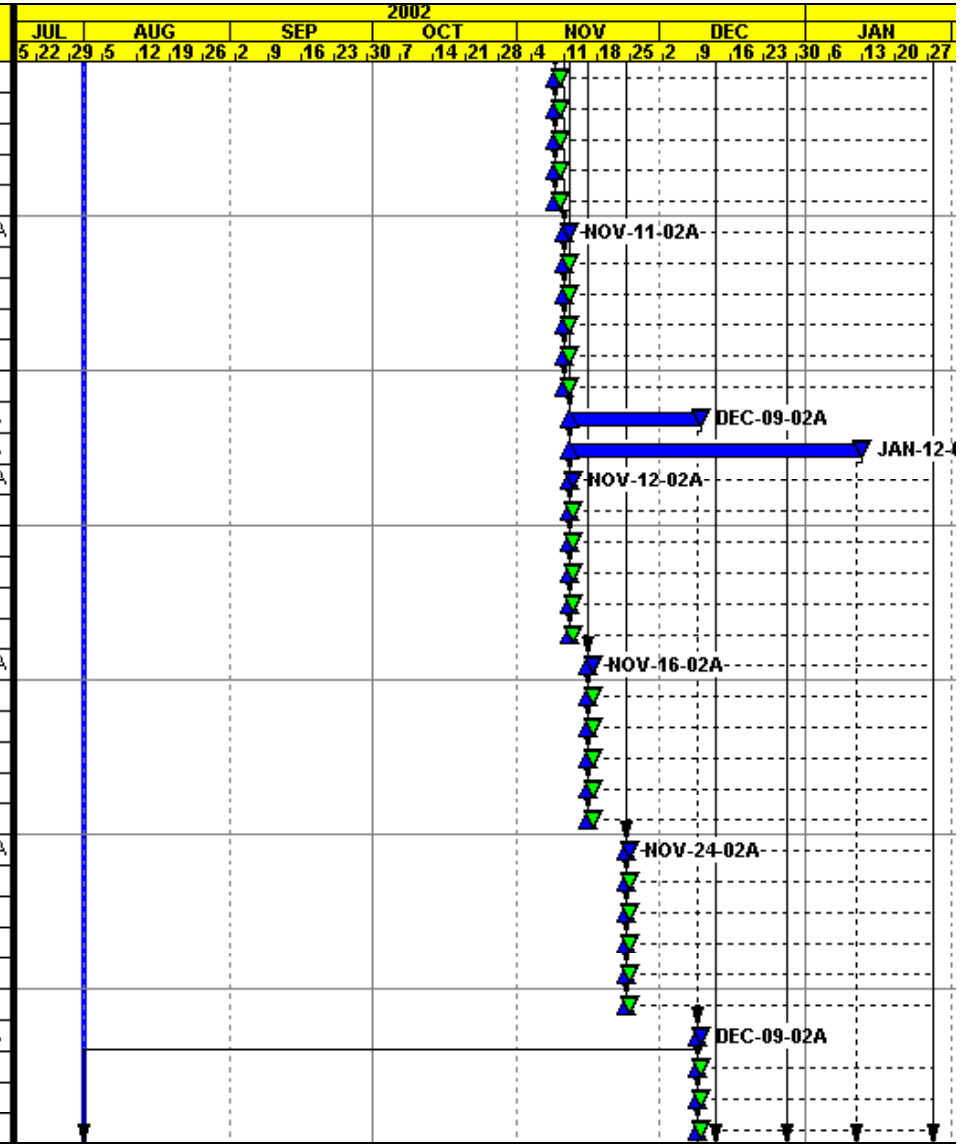


**Figure D-1. Schedule for laboratory testing (contd.)**

| Activity ID | Activity Description | Early Start | Early Finish |
|---|---|---|---|
| DS 544 | 56 Days RCPT Testing | DEC-09-02A | |
| DS 545 | 56 Days Absorption Testing | DEC-09-02A | |
| DS 350 | 90 Days Strength Testing | DEC-13-02A | DEC-13-02A |
| DS 351 | 90 Days Modulus of Elasticity Testing | DEC-13-02A | |
| DS 352 | 90 Days UPV Testing | DEC-13-02A | |
| DS 353 | 90 Days Permeability Testing | DEC-13-02A | |
| DS 354 | 90 Days RCPT Testing | DEC-13-02A | |
| DS 355 | 90 Days Absorption Testing | DEC-13-02A | |
| DS 450 | 90 Days Strength Testing | DEC-28-02A | DEC-28-02A |
| DS 451 | 90 Days Modulus of Elasticity Testing | DEC-28-02A | |
| DS 452 | 90 Days UPV Testing | DEC-28-02A | |
| DS 453 | 90 Days Permeability Testing | DEC-28-02A | |
| DS 454 | 90 Days RCPT Testing | DEC-28-02A | |
| DS 455 | 90 Days Absorption Testing | DEC-28-02A | |
| DS 550 | 90 Days Strength Testing | JAN-12-03A | JAN-12-03A |
| DS 551 | 90 Days Modulus of Elasticity Testing | JAN-12-03A | |
| DS 552 | 90 Days UPV Testing | JAN-12-03A | |
| DS 553 | 90 Days Permeability Testing | JAN-12-03A | |
| DS 554 | 90 Days RCPT Testing | JAN-12-03A | |
| DS 555 | 90 Days Absorption Testing | JAN-12-03A | |
| DT 100 | Recording Data | AUG-01-02 | JAN-27-03 |
| DT 200 | TESTING REPORT | | JAN-27-03 |

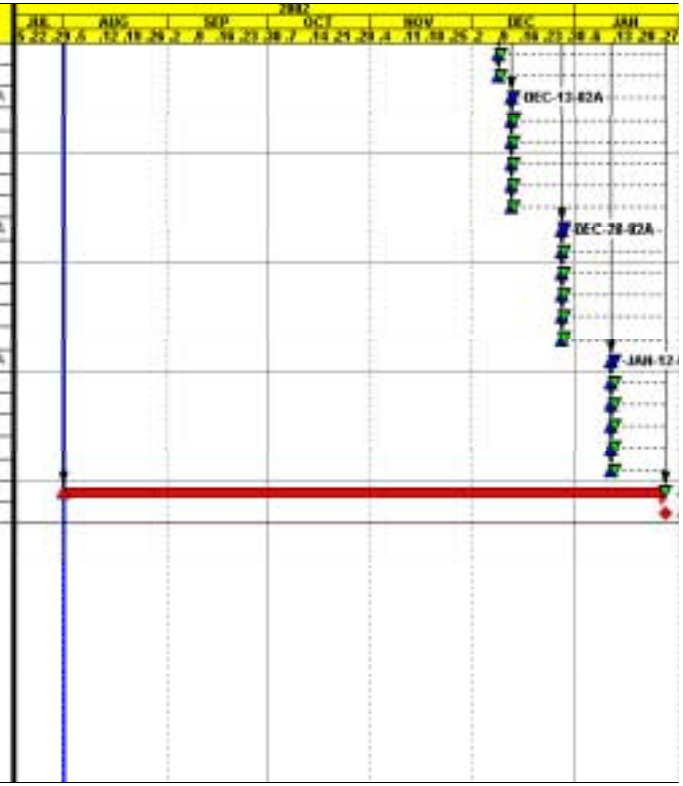


**Figure D-1. Schedule for laboratory testing (contd.)**

**APPENDIX E**

# Laboratory Data Sheets

Project Name : Investigate Cause & Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

Test Name :Determination of Air Content of Freshly Mixed Concrete by the Pressure Method

Related Code : (ASTM C231)

Conducted By : _____

Date : _____

---

**Brief Description of Test**

- Dampen the interior of measuring bowl and place it on a flat, level, firm surface. Place fresh concrete in three equal layers. Consolidate each layer by rodding (if slump>3 in), by either rodding or vibrating (if 1<slump<3 in), by vibrating (if slump<1 in).
- Strike-off the top surface of concrete and finish it smoothly with a flat strike-off plate using great care to leave the measuring bowl just level full.
- After strike-off clean all excess concrete from the exterior of the measuring bowl (base rim) and cover. Then clamp base rim and cover.
- Open petcocks. Inject water through one petcock until water is expelled from opposite petcock.
- Close air bleeder valve on air chamber. Close petcocks. Pump up air to the marked point on gauge. Wait a few seconds and tap gauge lightly. If necessary add or subtract air to attain reading at the marked point.
- Press needle valve lever to release air into base. Continue pressing lever and lightly tap gauge. Read direct percentage of air.
- Thoroughly clean base, cover and petcock openings with running water.

---

**Measure**

A (Air Content, %) = _____

---

Project Name: Investigate Cause & Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

Test Name : RCPT Test

Related Code : (ASTM C 1202-91)

Conducted By : _____

Date : _____

_____

_____

Specimen No :_____
Cell No :_____
Diameter (in) :_____
Length (in) :_____
Vacuum Saturation Started :_____
Saturation Ended :_____
Initial Specimen Weight before Saturation (g) :_____
In-water Specimen Weight After Saturation (g) :_____
Surface Dry Specimen Weight After Saturation (g) :_____

| Time | Voltage (mV) | Current (Amp) | Temp in NaCl (F) | Temp in NaOH (F) |
|---|---|---|---|---|
| | | | | |
| | | | | |
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Project Name: Investigate Cause & Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

Test Name : Determination of Slump of Concrete

Related Code : (ASTM C143)

Conducted By : _____

Date : _____

_____

**Brief Description of Test**

- Fill the mold with concrete in three layers of equal volume, (one third of the volume of the mold fills it approximately to a depth of 6.7 cm; two thirds of the volume approximately fills it to a depth of 15.5 cm) each time rodding the layers with 25 strokes of tamping rod evenly distributed on the surface.
- Strike-off the top surface of concrete and finish it smoothly by rolling the damping rod.
- Remove the mold by raising it vertically and put the mold near the concrete.
- Measure the decrease in height to the nearest 6 mm.

_____

**Measure**

Slump = _____

_____

| | Specimen Number | Length 1 | Length 2 | Length 3 | Diameter 1 | Diameter 2 | Diameter 3 |
|---|---|---|---|---|---|---|---|
| | | (inch) | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | | | | | | |
| 24 | | | | | | | |
| 25 | | | | | | | |
| 26 | | | | | | | |
| 27 | | | | | | | |
| 28 | | | | | | | |
| 29 | | | | | | | |

Project Name: Investigate Cause & Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

Test Name : Determination of Unit Weight of Concrete

Related Code : (ASTM C138)

Conducted By : _____

Date : _____

---

**Brief Description of Test**

- Determine the volume of the measure. (V)
- Determine the mass of the measure. (T)
- Fill the measure with concrete in three layers each time rodding the layers with 25 strokes of tamping rod evenly distributed on the surface. After rodding each layer tap the sides of measure.
- Strike-off the top surface of concrete and finish it smoothly with a flat strike-off plate using great care to leave the measure just level full.
- After strike-off clean all excess concrete from the exterior of the measure.
- Determine the mass of the measure plus its contents. (M)

---

**Measure**

V (Volume of measure) = _____

G (Mass of conc. and measure) = _____

T (Mass of measure) = _____

---

**Calculate**

M (Unit weight of concrete) = (G-T)/V = ____

Project Name: Investigate Cause & Develop Methods to Minimize Early-age Deck Cracking on Michigan Bridge Decks

Test Name : Absorption Test

Related Code :

Conducted By : _____

| **Specimen No** | | | | | |
|---|---|---|---|---|---|
| **Weight 1 (gr)** | | **Date** | | **Time** | |
| **Weight 2 (gr)** | | **Date** | | **Time** | |
| **Weight 3 (gr)** | | **Date** | | **Time** | |
| **Weight 4 (gr)** | | **Date** | | **Time** | |
| **Dry Diameter (in)** | **1** | **2** | **3** | | |
| | | | | | |
| **Dry Length (in)** | **1** | **2** | **3** | | |
| | | | | | |

**Saturation Starts**

| | | | | | |
|---|---|---|---|---|---|
| **Weight 5 (gr)** | | **Date** | | **Time** | |
| **Weight 6 (gr)** | | **Date** | | **Time** | |
| **Weight 7 (gr)** | | **Date** | | **Time** | |
| **Weight 8 (gr)** | | **Date** | | **Time** | |

**Start boiling for 5 hours**

| | | | | | |
|---|---|---|---|---|---|
| **Weight after boiling (gr)** | | **Date** | | **Time** | |
| **Weight in water (gr)** | | **Date** | | **Time** | |
| **Saturated Diameter (in)** | **1** | **2** | **3** | | |
| | | | | | |
| **Saturated Length (in)** | **1** | **2** | **3** | | |
| | | | | | |