

## FWD TESTING SUMMARY GUIDE – FALLING WEIGHT DEFLECTOMETER – 2008-PRESENT

### Software

FWDWIN will be used for all MnROAD FWD testing for March 2008 and beyond. It uses Dynatest Control Center to operate the system. The MDB files (custom setup) was developed with pavements so both MnROAD and Mn/DOT State testing could be completed and put into a common database using loaders developed in 2007 (modified 2008).

#### INITIAL SETUP

The FWD computers will be setup with the operating system. Remember to enter the

sensor & load cell gains along with the infrared and air temperature calibration settings.

#### START UP

- Connect the power cord to computer
- Connect the network cable to the computer
- Turn on “green” button to start the CP15 processor located in the trailer.
- Start up computer
- Start up GPS once CP15 is booted up – it’s connected to the power for the trailer mounted beacon

### Data Collection Process

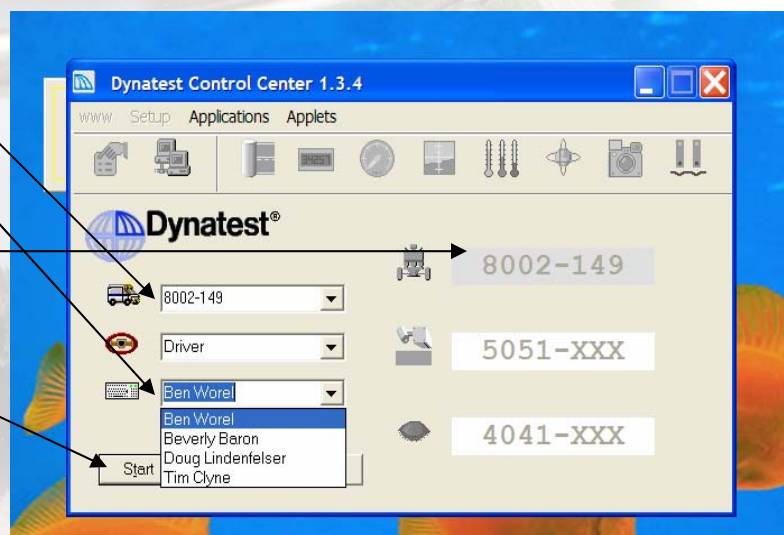
#### OPEN DYNATEST CONTROL CENTER

- Pick FWD Unit
- Pick/Enter FWD Operator
- Make sure FWD picture is highlighted/colored
  - May need to wait 10 seconds or so
- “Start” the program

#### GPS ACTIVATION

The GPS system is poorly setup by Dynatest for our needs (Use the following to get the GPS to connect with the FWDWIN software we are using)

- Make sure the CP15 is fully powered up.
- Power up the GPS from the red button on the control box (also starts the trailer beacons).
- The GPS is controlled from the Setup then GPS settings in the Dynatest testing software. Here are the details for the settings:



- GPS location at MnROAD should be roughly 45N and 94W
- The GPS should be “embedded” to the CP15
- GPS Baud Rate is 4800
- GPS should be plugged into the CP15 processor on the trailer.

### SENSOR LOCATIONS

Check to make sure sensors are located at the typical locations. As of May 2009 we have 10 sensors and they are numbered and located at the following:

Sensor Number	1	2	3	4	5	6	7	8	9	10
Distance (in)	0	8	12	18	24	36	48	60	72	-12

### FILL IN TESTING DESCRIPTION

#### Roadway

- MnROAD
- City of \_\_\_\_\_
- \_\_\_\_\_ County

District = 3

Section/Cell = Cell #

- 33 not 033 (for MnROAD) or
- CSAH 33
- CR 3
- I 94

Start & End

- Don't use for MnROAD
- County use where the DMI started or the points used for reference for testing.

Lane = (pick from drop down) – See appendix

Test Setup = (pick from drop down)

- See next page for view

Comment = Use as needed

- Suggest that county testing use this for how they test.

Remark = Noted later in testing

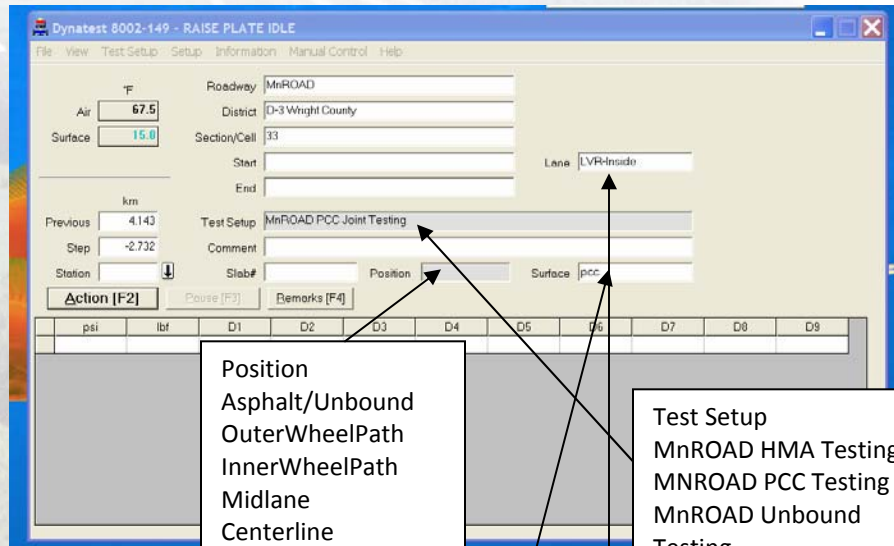
Slab# =

- Enter Concrete Slab number
- Or if sensor testing enter sensor number where the load plate is centered on (example 22LE100)
- Using PCC or Sensor Test Setups will also prompt you for this.

Position = (pick from drop down shown)

Surface = (pick from drop down shown)

- Specifications



- Position
- Asphalt/Unbound
  - OuterWheelPath
  - InnerWheelPath
  - Midlane
  - Centerline
  - Concrete
  - Center
  - Corner
  - MidEdge
  - Joint Before
  - Joint After
  - Sensor

- Test Setup
- MnROAD HMA Testing
  - MNROAD PCC Testing
  - MnROAD Unbound Testing
  - MnROAD Sensor Testing
  - County Testing

- Lane
- LVR Outside
  - LVR Inside
  - LVR Outside Shld
  - LVR Inside Shld
  - ML Driving
  - ML Passing
  - ML Driving Shld
  - ML Passing Shld
  - Farm Eastbound
  - Farm Westbound
  - Driving
  - NA

- Surface
- Asphalt
  - Concrete
  - Base
  - Subgrade
  - Aggregate

### SETUP SCREEN WHEN “SET UP IS SELECTED”



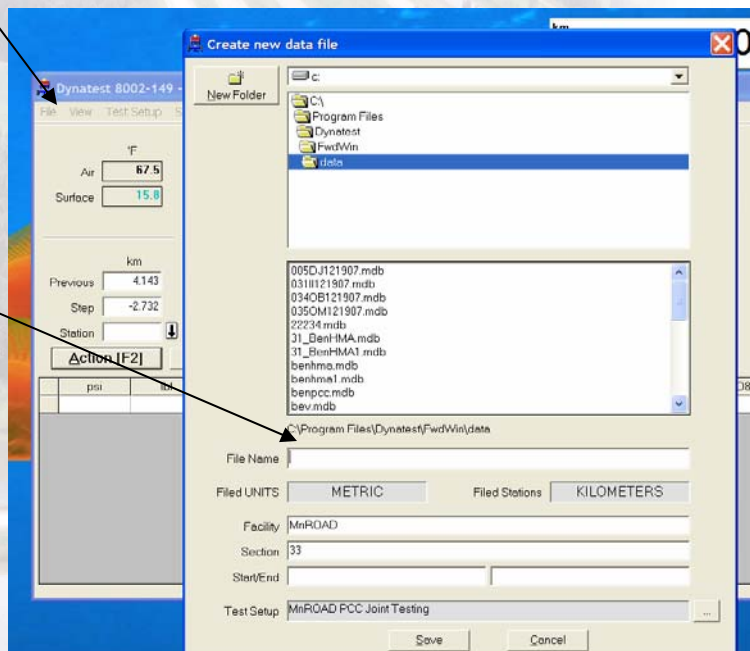
Note the following should already be pre-entered (you only need to scan them for a check)

- 3 drops for both HMA and PCC
- Loads set at 6,000, 9,000, 12,000 lbs.
- Load history on 9,000 only (duplicates the typical semi weights)
- HMA only prompts "Station"
- PCC and Sensor prompts "Slab ID, Test Position"
- Sensor 10 added to the system May 2009 so no need to move any sensors anymore for PCC Joint Testing. Sensor 10 will be located at -12 inch for all testing (both HMA and PCC).

Note county testing should either have the program enter STA as a point location or have the distance DMI set to collect distance from the noted start location (C/L of a roadway)

#### OPEN A DATA FILE

- File "New" file
- Keep the location of the file as the default location
- ICON on desktop for easy access later on
- C:\Program Files\Dynatest\FwdWin\data directory
- MnROAD File Naming (12 digits)
  - 3-digit cell number
    - OWP (HMA-OWP)
    - IWP (HMA-IWP)
    - MDL (HMA-midlane)
    - EDG (PCC Edge)
    - JTS (PCC Joints)
    - CEN (PCC Center)
    - SEN (Sensor Test)
  - 1-digit Lane
    - D=Driving, P=Passing
    - I=Inside, O=Outside
    - E=East, W=West, N=North, S=South
    - S=Shoulder
  - 6-digit Date
    - Month-Day-Year
    - 040108 for April 1, 2008
  - Example for testing a HMA in the outerwheel path driving lane, for cell 22 on April 1, 2008 = 022OWPD040108.mdb
    - Note the mdb extension will be added by the computer software.
- For other testing including counties use the following.



- Instead of the 3-digit cell number enter in the name of the facility – Example of “Clay County” or “Interstate94” then use the offset, lane, date format above. Example “ClayCountyOWPE05212009”.
- The facility-Section should already be entered if you filled in the section information before opening a file.
- “Save” the file
  - Data will be collected as the equipment tests (don’t need to save before ending testing)

### CONDUCT THE TESTING

- PCC Testing see maps developed for each cell
  - Subsections will be tested as the original cell (Cell 5 for 105,205)
  - Can also test other non-standard panels but the FWDSCAN will note non-standard testing was done.
- HMA Testing see charts for test points
  - Only test on the test points
- Hit F2 or use the mouse to on “ACTION [F2]” to start a test
- Close a file using the same process you used to open a file but use “File Close”
- Open a new file for new cell or pass or close out the program if you’re done.

### START OF EACH DAY

- Pickup the jump stick for your FWD unit.
- Pickup a daily log to document what you tested that day.
- Determine the cells that need to be tested from the list.
- Talk to the other FWD operators so you’re not testing the same cells that day.
- Test

### END OF EACH DAY

#### Move data to Jump Stick

- Go to the Data Directory (use the ICON on the front)
- Select the data files (Highlight all the files or use “Contol-A”)
- Copy the data files (Control-C)
- Paste the data files to your jump stick (Control-V)
- Leave the jump stick at MnROAD in the FWD area (MnROAD personnel will move the files onto the R:\drive for loading into the database)

#### Check off the files collected that day on the written FWD log

- Use your initials to check off the cell(s) tested

#### Leave the cell check off list in the FWD data area at MnROAD.

- Forms are provided at MnROAD.
- Bev will enter the forms into the database.



## MnROAD Lane and Test Point Descriptions

### MAINLINE

Cell 23	Passing Lane	Cell 1
"East End"	<b>Driving Lane</b>	"West End"

### LOW VOLUME ROAD

<b>East</b> Low Volume <b>Road</b> Loop	Cell 54	Outside Lane	Cell 24	<b>West</b> Low Volume <b>Road</b> Loop
	"East End"	<b>Inside Lane</b>	"West End"	
	Cell 40	Inside Lane	Cell 33	
	"East End"	<b>Outside Lane</b>	"West End"	

### FARM LOOP

PCC Slab	Eastbound Lane	Gravel Curve
"East End"	<b>Westbound Lane</b>	"West End"

### HMA

- 1 – Use the marked test points
- 2 - Always tested pointing the FWD West

	← OuterWheelPath →	9.5 ft
	← Midlane →	6 ft
"East"	← InnerWheelPath →	2.5 ft
	← InnerWheelPath →	Lane Offsets = 2.5 ft
	← Midlane →	6 ft
	← OuterWheelPath →	9.5 ft

### PCC

- 1 – Test the PCC slabs
- 2 – Use the panel number and points marked on test slab
- 3 - Always tested in the direction of traffic

← <b>TRAFFIC</b>	MidEdge ●	Corner ●	11.5 ft
	Joint After ●	● Joint Before	9.5 ft
	Center ●		6 ft
	Lane Offsets =		
	Center ●		6 ft
Joint Before ●	● Joint After	<b>TRAFFIC</b> →	9.5 ft
	● Corner	● MidEdge	11.5 ft



<b>Asphalt Test Sections</b>				
<b>Mainline Cells</b>		<b>Test Points</b>	<b>Low Volume Road Cells</b>	<b>Test Points</b>
1,2,3,4		10 – 1.5	24 , 31, 33, 34, 35	10 - 1.5
15,16,17,18,19,20,21,22,23		10 – 1.5	77	5 - 0
			78,79	6 - 0
1, 71		TBD - 2009	86, 87, 88	3 - 0
			83, 84 (Farm)	5 – 0, 5 - 0
<b>Concrete Test Sections</b>				
<b>Mainline Cells</b>	<b>Panels</b>		<b>Low Volume Road Cells</b>	<b>Panels</b>
5	34, 32, 27, 22, 18, 14, 10, 3		32	41, 29, 20, 11, 2
6	32, 26, 21, 14, 9, 4		36	31, 25, 19, 13, 6
7	19, 14, 9, 4, 0		37	41, 33, 25, 16, 8
8	32, 25, 18, 11, 4		38	31, 25, 18, 12, 5
9	28, 21, 14, 7, 0		39	41, 35, 21, 15, 7
10	22, 16, 10, 6, 0		40	30, 24, 17, 11, 4
11	17, 13, 10, 5, 1		52	17, 14, 8, 5, 2
12	27, 19, 14, 7, 1		53	6, 5, 4, 3, 1
13	34, 31, 26, 24, 19, 15, 12, 10, 8, 5, 4, 3 (jt only), 2, 1		54	11, 7, 2
14	74, 67, 64, 60, 59 (jt only), 58, 56, 55 (jt only), 50, 45, 35, 22, 17, 12, 4		85	18, 14, 4
60	39, 29, 13, 11		89	16, 7, 2
61	41, 24, 11, 2		64 – Pervious Parking Lot	2, 1
62	42, 34, 19, 9			
63	33, 13, 3, 2			
96 (jts only)	Drive: 33, 29, 24, 17, 11, 8, 2; Pass: 33, 24, 11, 2			
97 (jts only)	Drive: 13-8, 6-0 Pass: 12, 10, 8, 3			
92 (jts only)	Drive: 14-12, 10, 8, 5, 3, 1, 0; Pass: 14, 13, 8, 1			
72	TBD – 2009 Construction			
73	TBD – 2009 Construction			





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## For more information:

For more information about MnROAD and the Road Research program at Mn/DOT:

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MnROAD is a state of the art cold weather pavement and transportation testing facility located in Minnesota