

Measuring the Thickness of Fills & Coatings

1. Why do it?

The Dipstick[®] helps you obtain the exact thickness of fills or coatings quickly and non-destructively – without coring! Because of the extreme accuracy and repeatability of the Dipstick[®], you can use it to measure the thickness of concrete floors, asphalt roadway overlays, or virtually any other fill or overlay material.

2. What Do You Need?

All you'll need is your Dipstick[®] and a chalk line. It also helps to have a can of spray paint for marking the ends of the lines. You can do this with either the Floor Dipstick[®] or the Road Dipstick[®]. Both types of Dipstick[®] can do this.

3. The Basic Concept

You'll measure the surface before adding the fill or overlay, and once again after the fill has been added. The Dipstick software will calculate the thickness by subtracting the "Before" data from the "After" data. You can see the thickness in a graph and also as a table of thicknesses at each point touched by the Dipstick[®].

4. Marking the surface

To get excellent data, you will need to collect both sets of data on the same lines, once before adding the fill and once after adding the fill. The easiest way to do this is to measure from a location that is off the surface to receive the fill, (in an area that will not change as a result of filling) continue across the fill area to be filled, and Run the measurement line off the fill area to another location on the far side that won't change. Start on one slab, step down into the subgrade of the slab that will be poured, measure across the subgrade to be filled, then go up and onto the far side outside the slab to be poured.

a) Mark the Start Point.

Mark the start point of this line – which must be outside the area to be filled. An easy way to do this is to set the Dipstick[®] down with the rear end where you want the line to start, and mark the start point by circling the rear "Moon Foot" of the Dipstick[®] with a crayon, then pick up the Dipstick[®] and mark this location with a few dots from a can of spray paint. If marking the surface with paint is not allowed, you can use a lumber crayon, "keel" or soapstone marker. All of these are easily removed, so if you don't used paint, you'll need to tape a piece of plastic or paper over the marks, so the marks will stay there until after the slab is poured or the asphalt is laid down.

b) Mark the Measurement Line.

Stretch a chalk line all the way across the area to be measured, from the starting point that you just marked to an end point outside the area to be measured. Don't worry about the exact location of the end point, just make sure the line goes across the surface where you will want the data. If the area to be filled is substantially lower than the form or curb, the chalk line will not touch the subgrade in the area to be filled. In this case, first use the chalk line to mark just the portions of the measurement line that is outside the area to be filled. After both of these short segments are marked, then step on the chalk line inside the area to be filled so it can snap a line on the subgrade.

5. Collecting Data

Start a Run at the start point, walk the Dipstick[®] down the line, step down into the area to be filled, and continue collecting data all the way to the end, at the far end outside the area to be filled. When you get to the end of the line, mark the end location by circling the *front* foot of the Dipstick[®] with a crayon. You'll want to mark this point with a spot or two of spray paint or by protecting the crayon circle with a piece of plastic or paper taped over it.

When you first step on the chalk line inside the area to be filled, wait for the "beep", then press the letter "S" on the Dipstick's handheld PC. The Dipstick[®] will "beep" again to indicate that it has marked that step number. Pressing the letter "S" does not cause the Dipstick[®] to collect another reading – it just marks the



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data to show your first step on the chalk line inside the area to be filled. Continue collecting data the normal way. When you reach the point where the front of the D is at the last point inside the area to be filled, wait for the “beep” and press the “S” key again, then continue collecting data until you reach the end of the line.

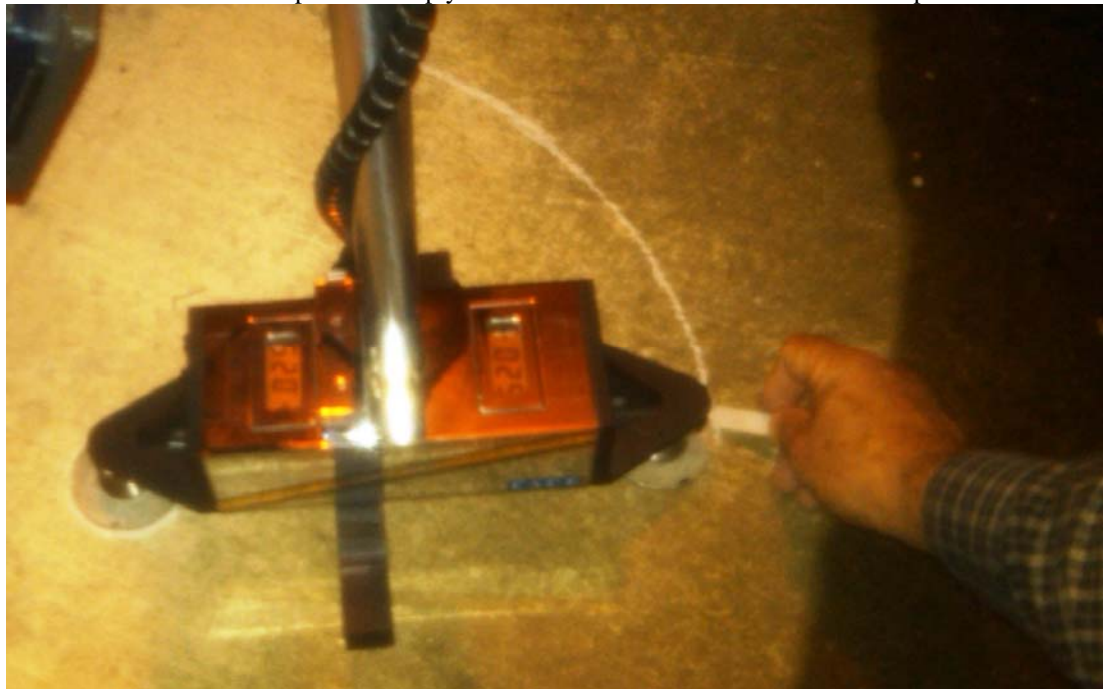
If the area to be filled is more than 2” deep, you’ll need to “step down” into the area to be filled by stepping on a brick or something similar. Place the brick just inside the area to be filled, over the chalk line, where you can step on it from just outside the area to be filled. As you walk the Dipstick® when you are collecting data, step off the line to the right or left while you are still outside the fill, so the Dipstick is *just* outside the area to be filled. Mark this point. Then step down onto the brick, and then down onto the subgrade and back on the chalk line. Repeat this process at the other side of the area to be filled if necessary.

After the fill has been applied to the surface, measure a new Run along the same line. Start at the same location and walk the same line. It is very important that the *last step before entering* the filled area is at the exact same location when making the “Before” Run and the “After” Run. Likewise, it is important that the *first step outside* the filled area is at the exact same location when making the “Before” Run and the “After” Run. You should mark these two points with paint or by taping a plastic or paper covering over the crayon marks.

6. Special Technique for Hitting these Spots

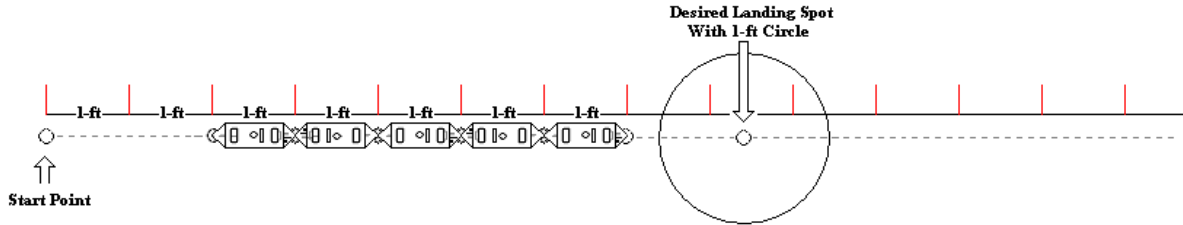
Here's how to make the “After” line land exactly on top of the same points along the “Before” line:

Before you collect the “After” Run, take the Dipstick® to the spots you marked from the first Run. For this part, you can ignore the starting mark and just do the two marks just outside the filled area. Put the Dipstick® down with one end exactly on the spot that you want to hit. Now use the Dipstick to help you make a circle 1-ft in radius around this point. You can position the crayon or soapstone just outside the Moon Foot as you swing the Dipstick.

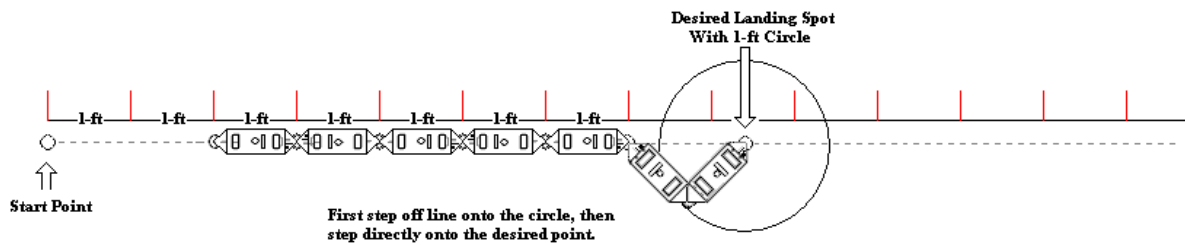


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Before you collect the “After” line, you will need to re-mark the line by snapping a chalk line from the starting point to the finish point. Then when you collect the “After” Run, start at the exact same starting location and hit the same spots as before. Be sure to step off line and hit the marked point before going across the filled area, and step back onto the chalk line with the next step. After the “beep”, press the “S” key, then continue to collect data.



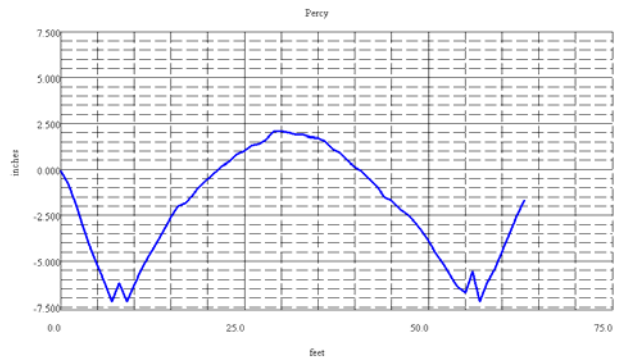
When you reach the end of the filled area, press the “S” key just before you leave the filled area, then step off to hit the marked point just outside the filled area. Use the 1-ft circle to hit this spot exactly, then continue along the chalk line to the end.



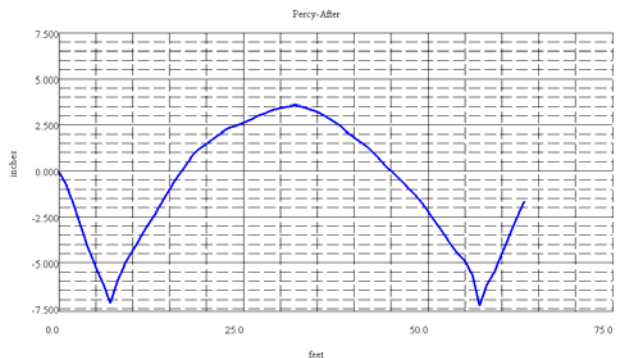
7. Processing the Data

Edit the RUN HEADER of the “Before” and “After” Runs and set the Start Point Elevation to 0. (zero) Do this for both Runs. Now look at the “Before” Graph and the “After” graph.

This is the “Before” graph.



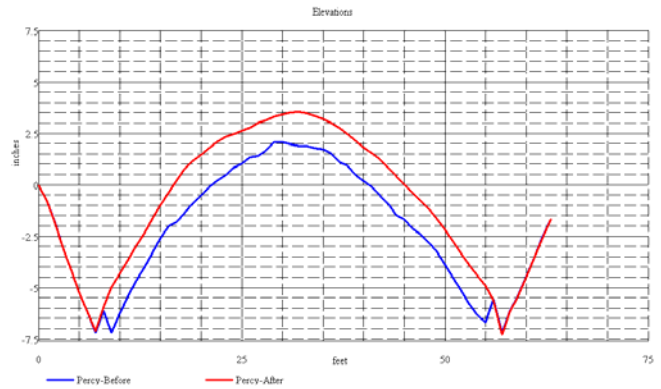
This is the “After” graph.



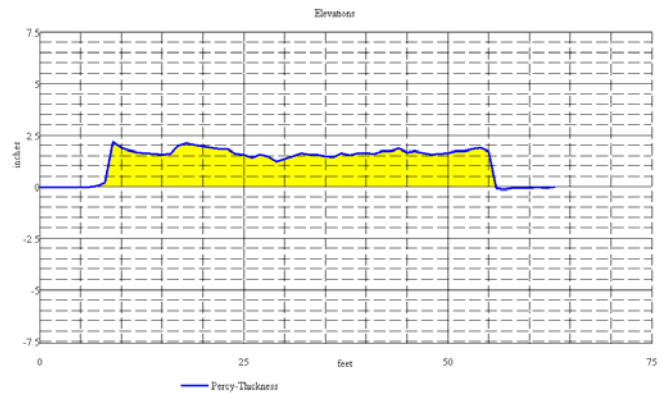
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If you bring both graphs up at the same time, you will be able to see the difference between them.

Close the graph, and leave both Runs highlighted, then use CALCULATE / DIFFERENCE. This will create a new Run that shows the difference between the “Before” and “After” Runs.



This shows the thickness of the fill in a graphical format.



You should use REPORT / NOTES for both Runs. This will give you the location of the beginning and end of the fill.

Note Step 9 : This is the first point inside the filled area.

Note Step 55 : This is the last point inside the filled area.

The data before and after this range should be essentially zero, because the surface outside the filled area is unchanged.

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Now use REPORT / DATA POINT LISTING to get a tabular report of the thickness at each point. In the example shown, the first seven steps and the last eight steps (in green) are outside the filled area and are ignored. The remaining data show the thickness of the overlay at every point.

Pavement Thickness			
Step	Dist (feet)	Reading	Pavement Thickness (in)
0			0.000
1	1.00	0.004	0.004
2	2.00	0.003	0.003
3	3.00	0.007	0.007
4	4.00	0.002	0.002
5	5.00	0.005	0.005
6	6.00	0.001	0.001
7	7.00	0.011	0.011
8	8.00	0.156	0.174
9	9.00	2.009	2.183
10	10.00	-0.291	1.892
11	11.00	-0.155	1.736
12	12.00	-0.069	1.667
13	13.00	-0.038	1.629
14	14.00	-0.017	1.612
15	15.00	-0.046	1.566
16	16.00	0.021	1.587
17	17.00	0.369	1.956
18	18.00	0.114	2.069
19	19.00	-0.058	2.011
20	20.00	-0.059	1.952
21	21.00	-0.089	1.863
22	22.00	-0.055	1.808
23	23.00	0.007	1.815
24	24.00	-0.222	1.593
25	25.00	-0.046	1.546
26	26.00	-0.109	1.437
27	27.00	0.094	1.531
28	28.00	-0.058	1.473
29	29.00	-0.273	1.200
30	30.00	0.154	1.354
31	31.00	0.124	1.478
32	32.00	0.153	1.630
33	33.00	-0.054	1.576
34	34.00	0.005	1.581
35	35.00	-0.093	1.488
36	36.00	-0.044	1.444
37	37.00	0.202	1.646
38	38.00	-0.068	1.578
39	39.00	0.093	1.670
40	40.00	-0.024	1.646
41	41.00	-0.012	1.634
42	42.00	0.148	1.782
43	43.00	-0.010	1.772
44	44.00	0.080	1.852
45	45.00	-0.163	1.689
46	46.00	0.075	1.763
47	47.00	-0.110	1.653
48	48.00	-0.023	1.630
49	49.00	0.002	1.632
50	50.00	0.013	1.645
51	51.00	0.131	1.776
52	52.00	0.004	1.780
53	53.00	0.070	1.849
54	54.00	0.079	1.928
55	55.00	-0.102	1.826
56	56.00	0.006	0.002
57	57.00	0.001	0.007
58	58.00	0.003	0.000
59	59.00	0.007	0.007
60	60.00	0.000	0.002
61	61.00	0.004	0.007
62	62.00	0.007	0.001
63	63.00	0.021	0.000