



Transport
Roads & Maritime
Services

Test method T1351

Weight sounding in swampy areas using
manual equipment

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Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Reformatted and Revision Summary Added	D.Dash	June 2001
Ed 2/ Rev 0	All	Reformatted RMS template	J Friedrich	November 2012

Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T1351 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T1351

Weight sounding in swampy areas using manual equipment

1. Scope

This test method sets out the procedure for carrying out soundings in swampy areas, using manual weight sounding equipment. The soundings may be used to provide the following information:

- (a) An indication of the relative shear strength of the material through which the point passes, and hence the location of the interface between different types of materials
- (b) An indication of the general nature of the material through which the point passes, i.e. cohesive or granular
- (c) Overall thickness of mud and loose sand layers, and depth of stiff material

The test applies only to preliminary or exploratory investigations. It may provide sufficient information for the solution of a specific simple problem, but is usually not adequate for critical geotechnical design. Shear strengths deduced from the test are very approximate and are not to be used in stability computations.

The primary purpose of the test is to locate the interfaces between different types of materials.

2. Apparatus

- (a) Weight sounding equipment such as supplied by Geonor A/S, consisting of:
 - (i) Drill rods, 1.0m long, 20 off
 - (ii) Drill rod, 0.8 m long
 - (iii) Helical point
 - (iv) Weight holder
 - (v) Turning handle
 - (vi) Weights 10 kg, 2 off
 - (vii) Weights 25 kg, 3 off
 - (viii) Spanners, 2 off
 - (ix) Tool for replacing studs
 - (x) Transport case
 - (xi) Drill rod extractor
- (b) Crowbar, to suit drill rod extractor ((a) (xi))
- (c) Wooden planks, approximately 0.75 m long. 4 off
- (d) Measuring tape, 2 m
- (e) Chalk or marking crayon
- (f) Cleaning materials: rags, brush and can of rust preventing fluid
- (g) Pick, shovel

3. Procedure

- (a) Lay all rods on two of the wooden planks, taking care to prevent the threads from becoming dirty. Note how many rods there are
- (b) Make chalk or crayon marks on all rods at 0.2 m intervals
- (c) Connect the helical point to one end of the 0.8 m drill rod, and a 1 m rod to the other. Screw all connections tightly home

- (d) Press the helical point about 0.2 to 0.3 m vertically into the ground, using the weight holder. If the ground surface is too hard to penetrate, use the pick to dig a shallow hole to softer material
- (e) Place weights on the weight holder in the following sequence, counting the weight holder as the initial 5 kg: 5 kg, 10 kg, 10 kg, 25 kg, 25 kg, 25 kg
- (f) Place only enough weights to cause penetration at a rate between 0.1 and 2.0 m/minute, the ideal rate being 1.2m/minute (10 seconds for 0.2 m penetration). If necessary remove one or more weights in reverse of the order in which they were placed
- (g) Record the minimum total weight required to cause this penetration rate, using the loading or unloading sequences described in the procedure (e) and (f)
- (h) If penetration does not occur with the full 100 kg loading, place the turning handle on the rod above the weights, and rotate the whole apparatus clockwise with a series of half rotations. Do not rotate the handle when the total loading is less than 100 kg
- (i) Record the number of half rotations required for each 0.2 m increment of penetration, i.e. to advance from one chalk mark on the rods to the next
- (j) If penetration is again found to occur without rotation, cease rotating the turning handle
- (k) Repeat the procedure described in clauses (f) to (j) inclusive as necessary
- (l) As penetration proceeds, whether by static loading or by static loading plus rotation, note the type of material the helical point is in by listening to the sound that can be heard during the penetration as follows:

Sound	Type of Material
None	Clay
Grating	Sand
Chatter	Gravel

- (m) Add additional rods, and raise the weights up the rods by lifting the weight holder, as required
- (n) Discontinue sounding when the number of half rotations required to penetrate 0.2 m exceeds 40
- (o) Note the maximum depth reached to the nearest 0.02 m. Check this depth measurement by the following formula:

$$\text{Depth} = (\text{Total length of rods on site plus length of helical point}) \\ \text{Minus} \\ (\text{Total length of unused rods plus length of protruding rod})$$

- (p) Remove the weights and weight holder from the rods
- (q) Place a plank on the ground on either side of the protruding rod. Place the drill rod extractor over the rod, invert the weight holder and place it also on the rod, immediately above the rod extractor. Place the crowbar in the rod extractor, and lift rods out of the ground by working the crowbar

4. Recording

Record the following:

- (a) Job, date, location in terms of chainage, offset and surface reduced level, if known
- (b) The depth of excavated hole, if any. If working in water, state the depth of water above ground
- (c) The total applied weight in kilograms
- (d) The number of half rotations required to cause each 0.2 m increment of penetration
- (e) The type of material at 0.2 m intervals
- (f) The maximum depth reached

5. Reporting

Report the following, including a graphical plot where appropriate:

- (a) Job, date, location and depth of water if any above ground.
- (b) The depth of the excavated hole.
- (c) When penetration without rotation has occurred, indicate by the number of kilograms, the total weight applied.
- (d) When penetration with rotation has occurred, plot the number of half rotations required for each 0.2m penetration. If penetration less than 0.2 m has been achieved, report the number of half rotations for the depth penetrated, e.g. 50/0.14.
- (e) Indicate on the graphical plot the type of material for each 0.2 m depth.
- (f) Plot the maximum depth reached and indicate penetration value at that depth.

6. Maintenance

- (a) Clean all equipment thoroughly at the end of each working day. Remove all mud with clean water, dry the equipment, then swab with rust preventing fluid. Pay particular attention to the threads on the rods, especially the female threads. Completely dismantle the weight holder for cleaning
- (b) If any rods become bent, do not discard them or attempt to straighten them. Forward them to an adequately equipped and staffed workshop for straightening