TROXER MODEL 3430 / 3440

Training Manual

This Training Manual has been compiled by:

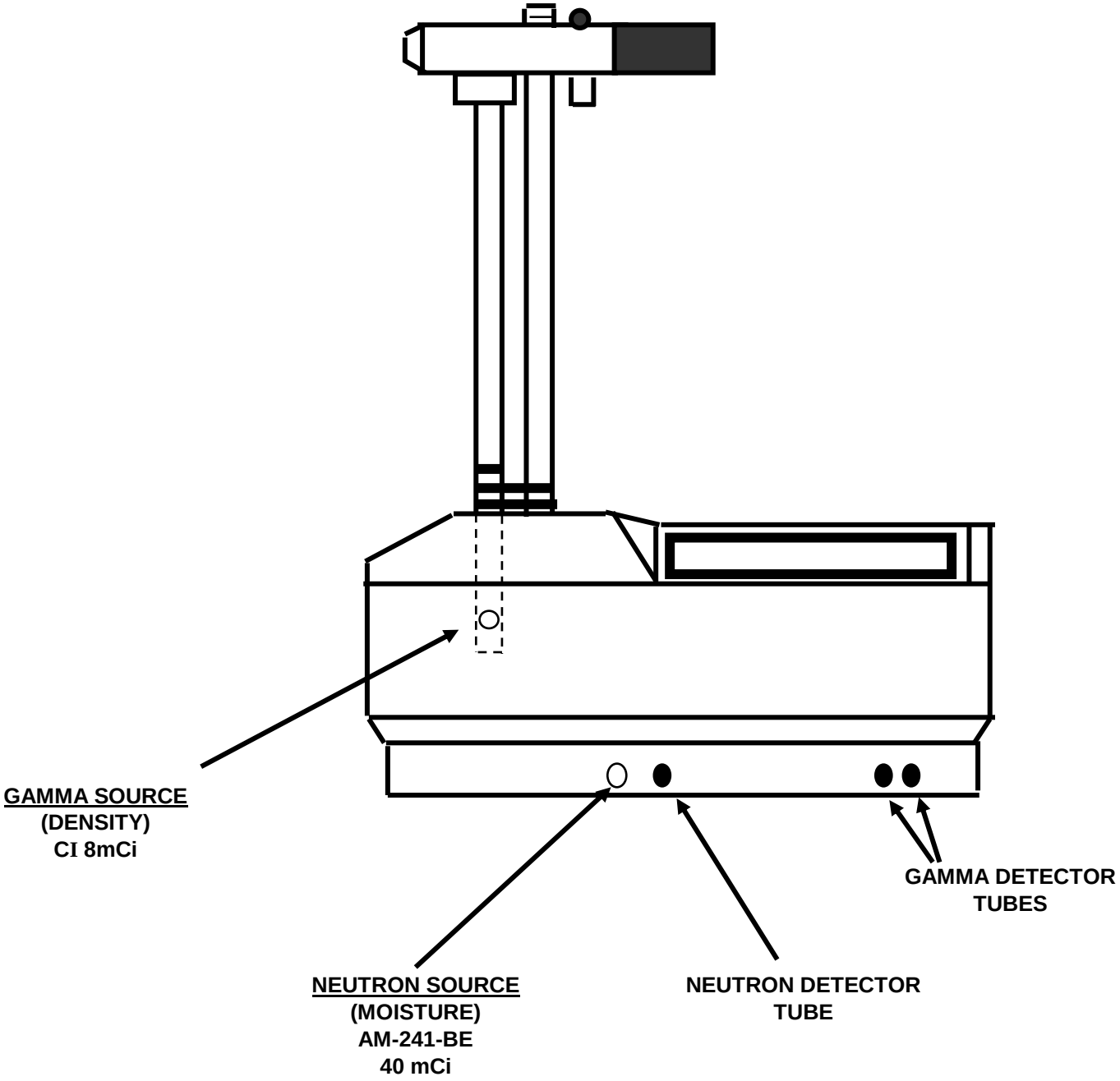
V.I. Instruments

For all your TROXLER Training

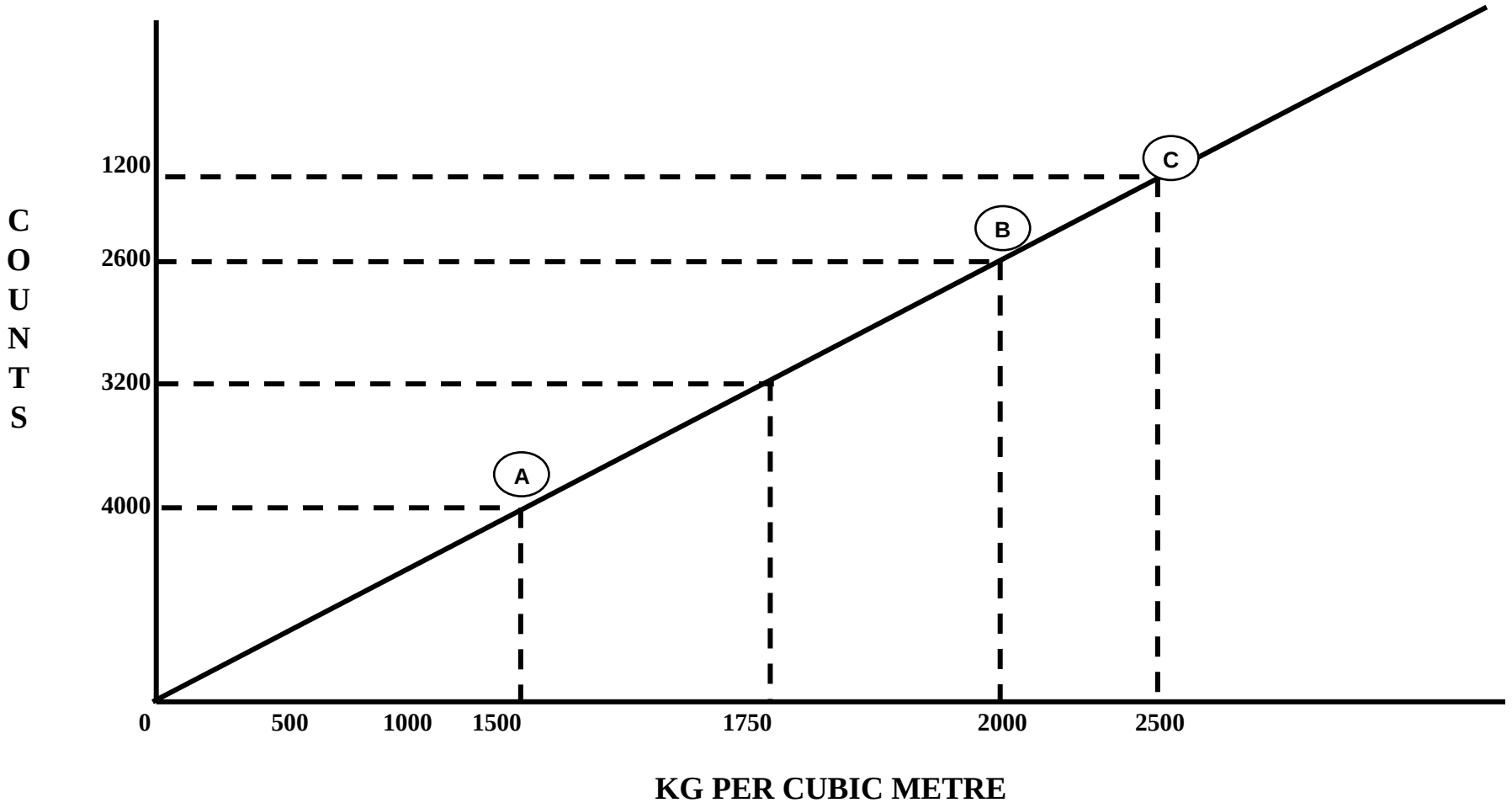
Contact us at 011 878 2600

TROXLER TRAINING
Model : 3430 / 3440

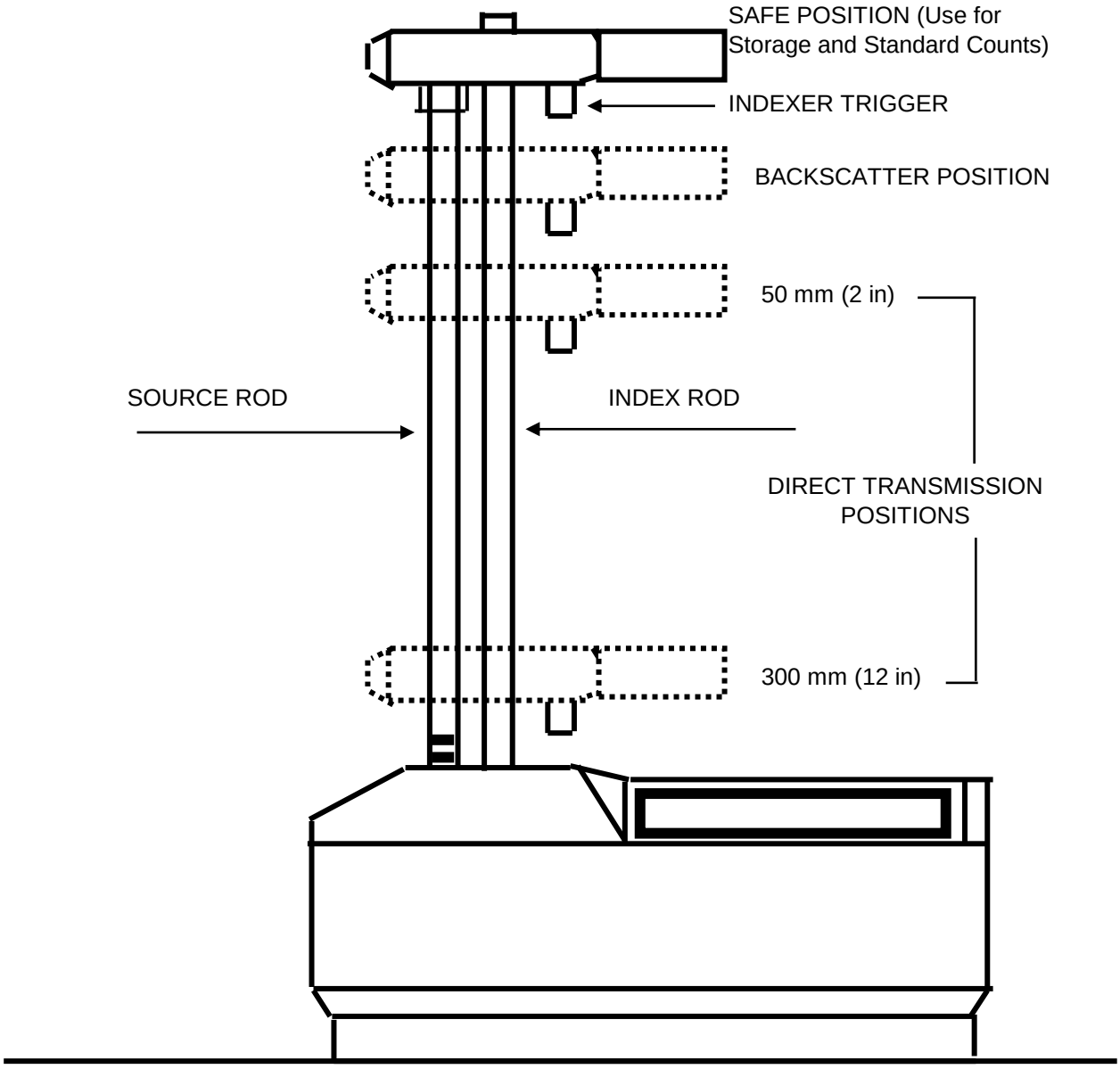
GAUGE GEOMETRY



GAUGE CALIBRATION



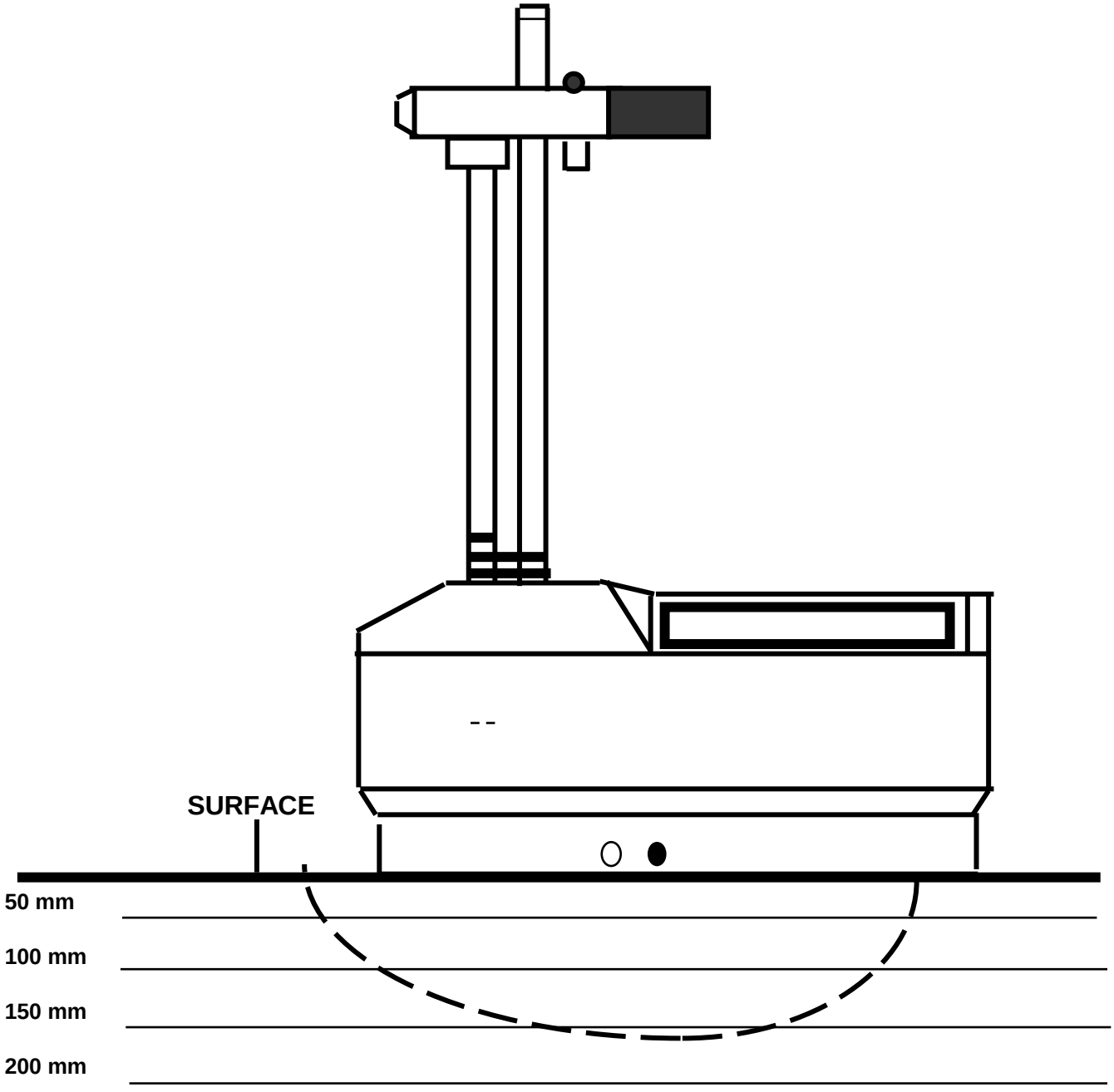
TROXLER 3430/3440 GAUGE SHOWING ROD POSITIONS



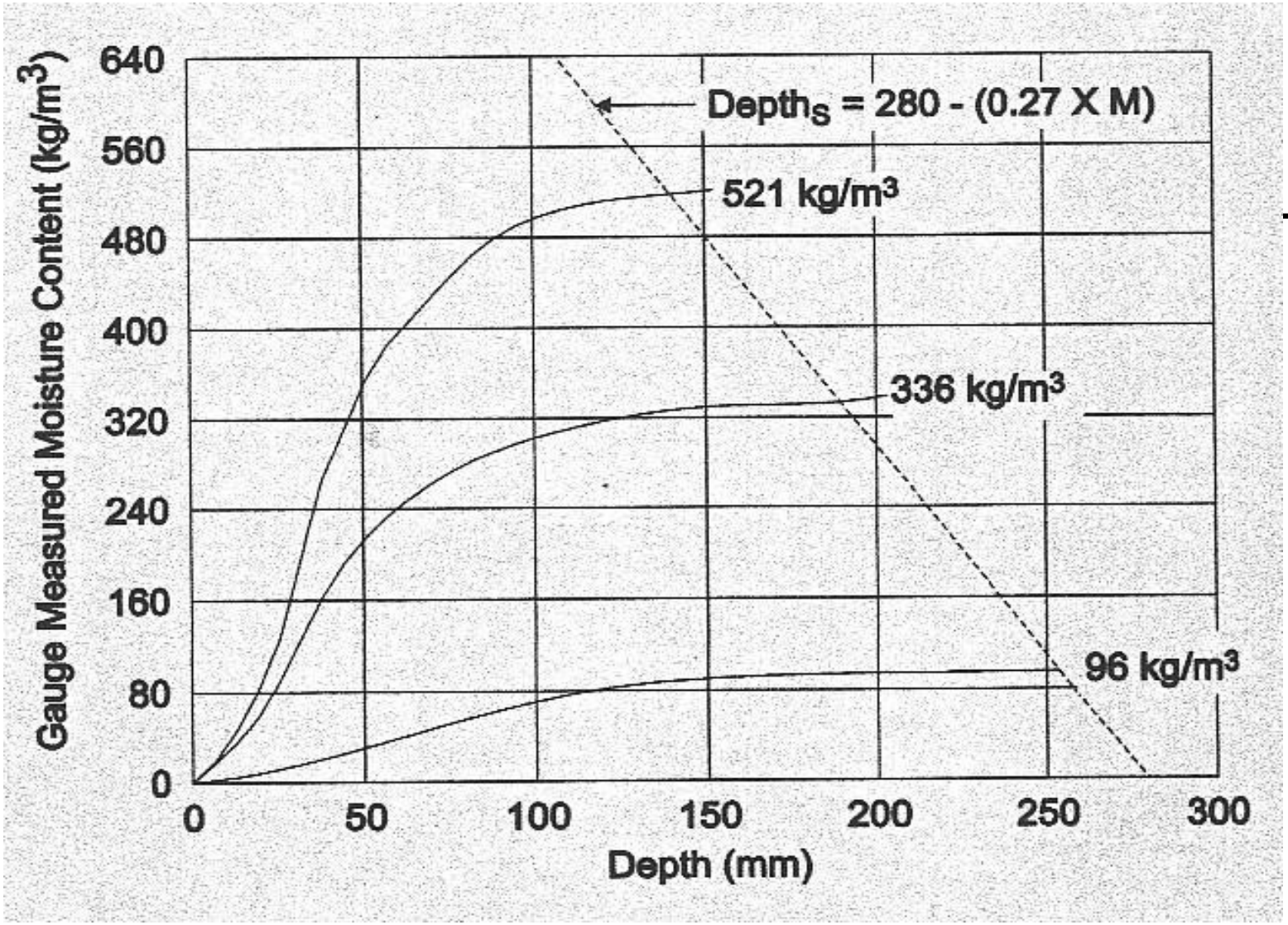
Place the gauge on the reference standard block as shown in Figure 2-2, making sure the block top and gauge base are clean and smooth, with no soil or other material to prevent good surface-to-surface contact. The gauge must be positioned between the raised edges of the block and with the right side of the gauge firmly seated against the metal butt plate on the block.

MOISTURE MODE

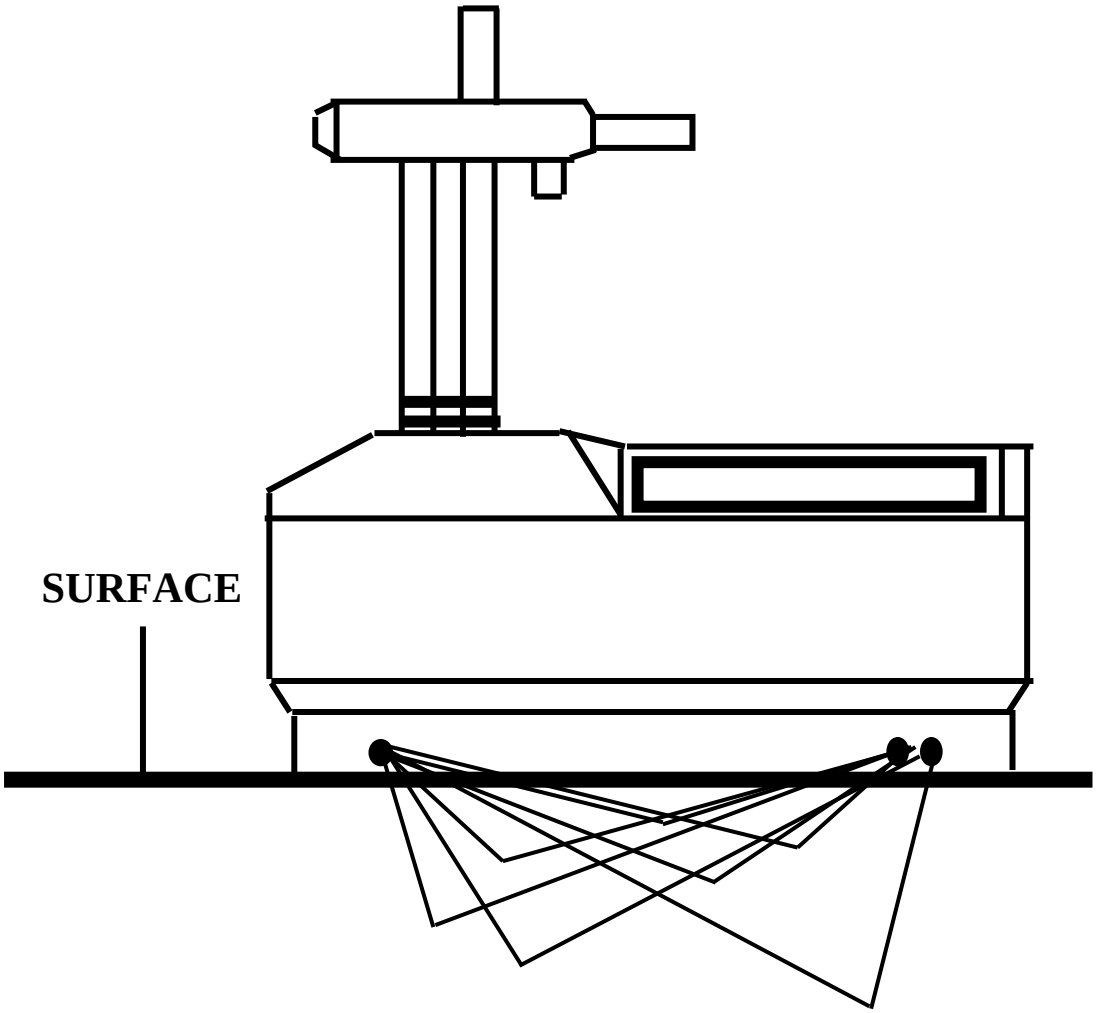
Depth of Measurement



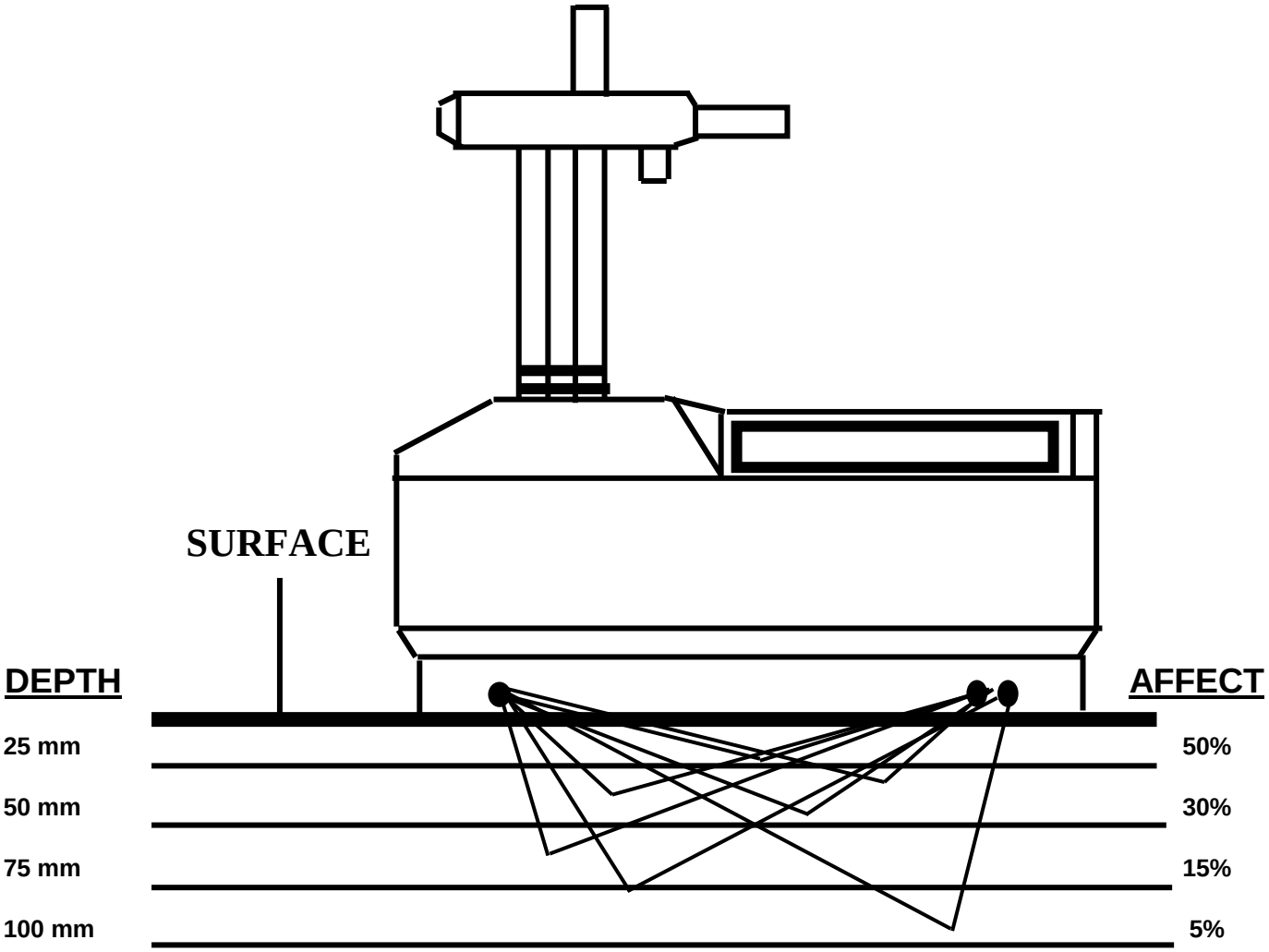
EFFECT OF MOISTURE ON DEPTH OF MEASUREMENT



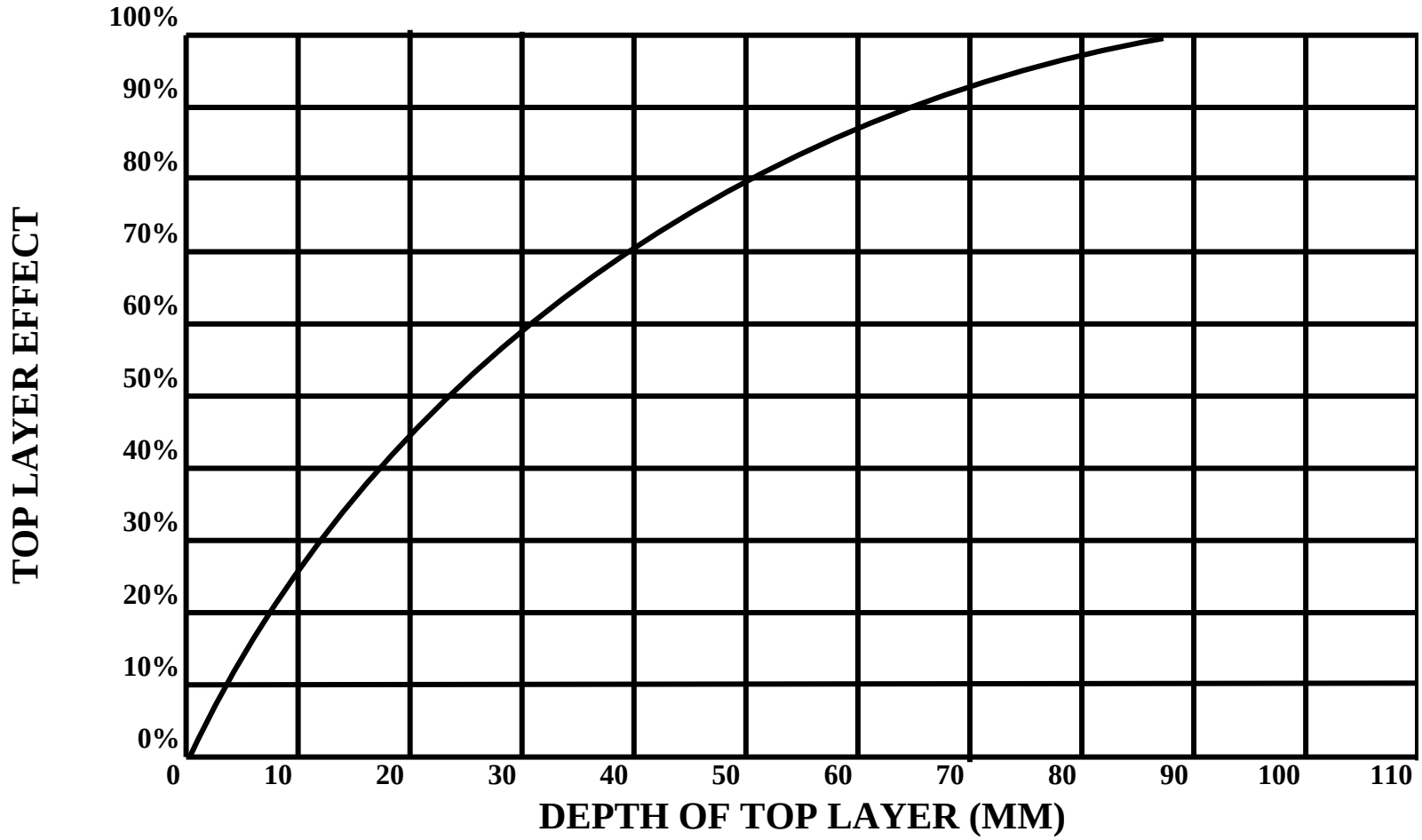
BACKSCATTER MODE



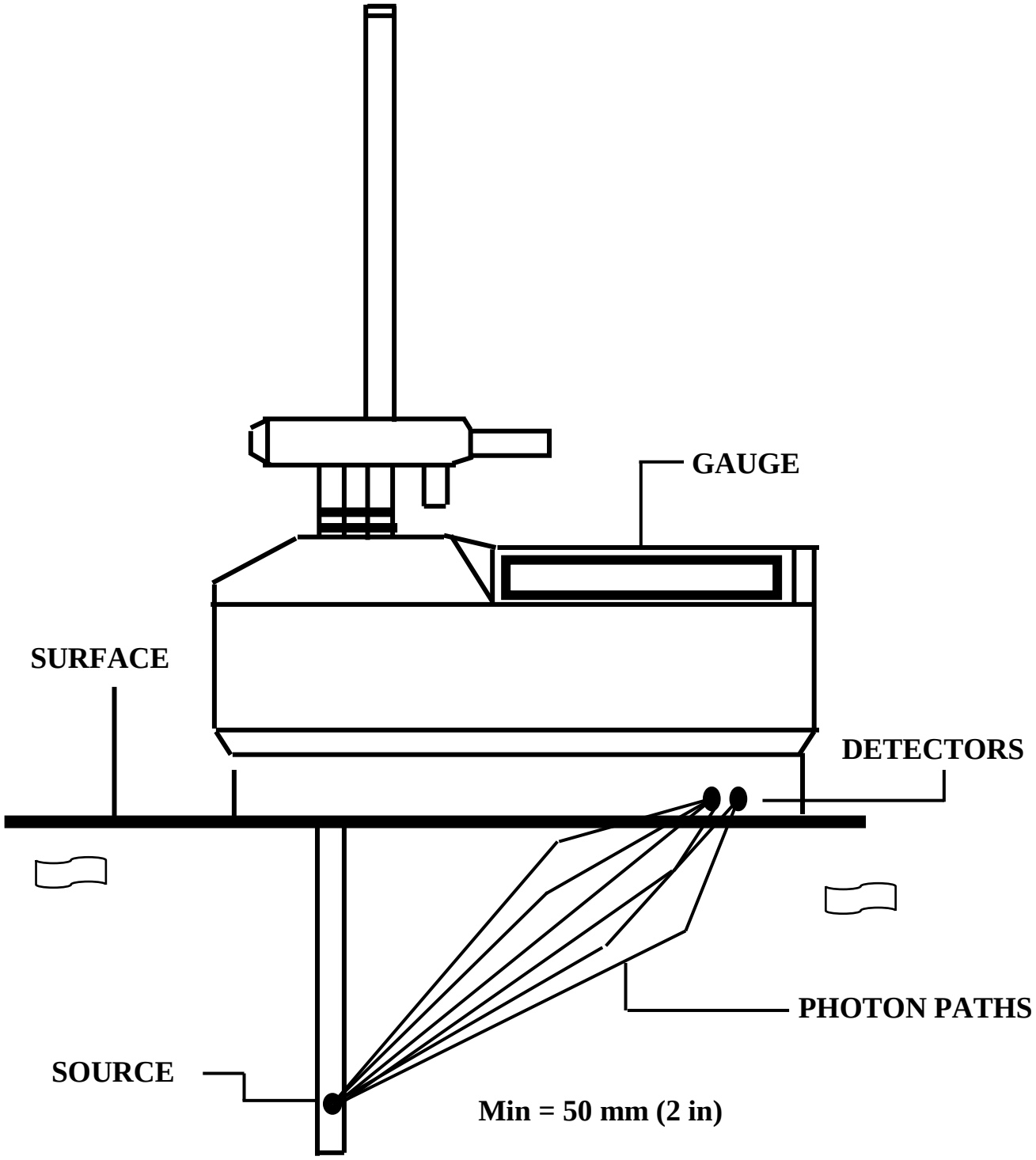
BACKSCATTER MODE
Depth of Measurement



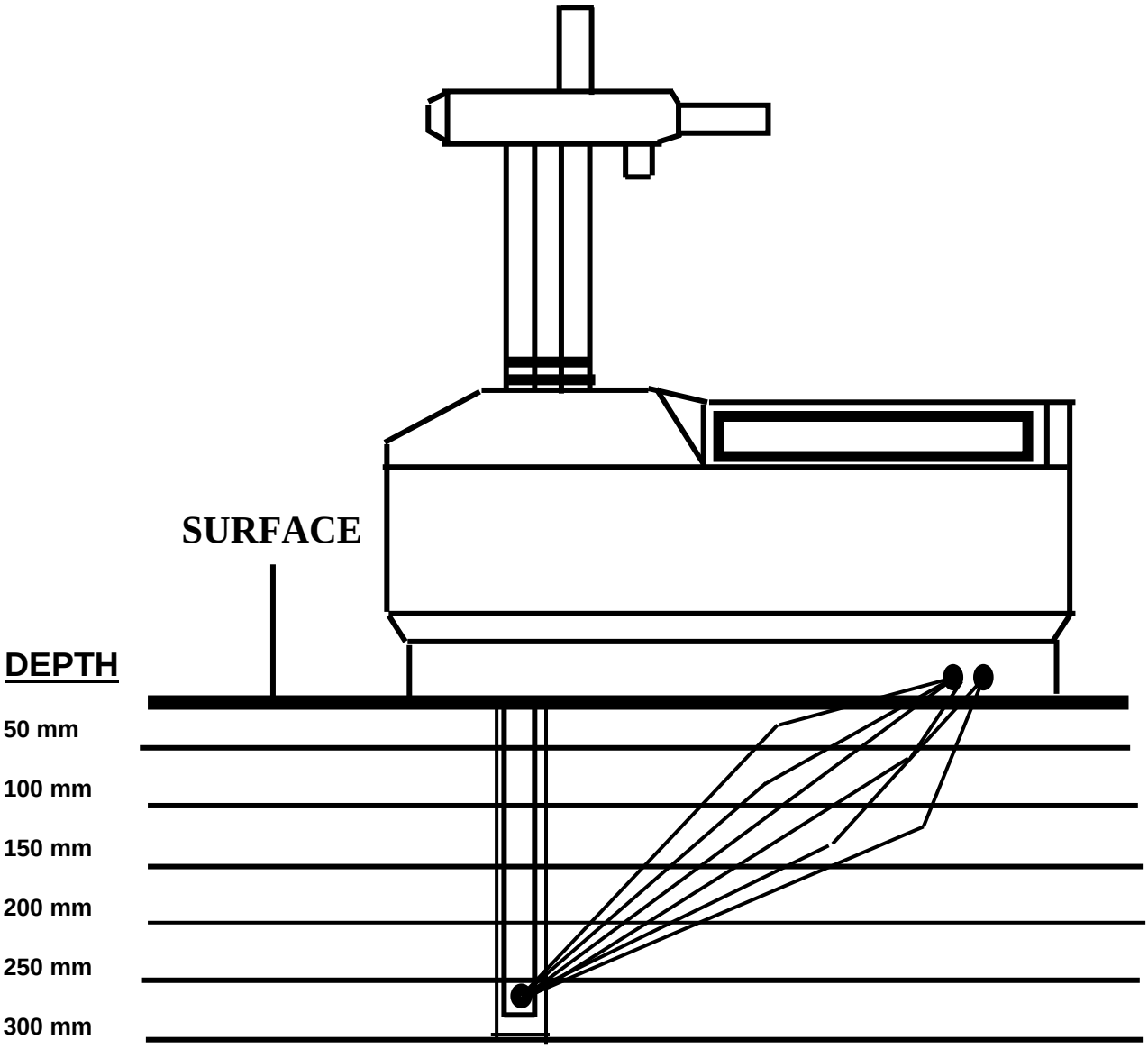
BACKSCATTER
(Depth of Top Layer)



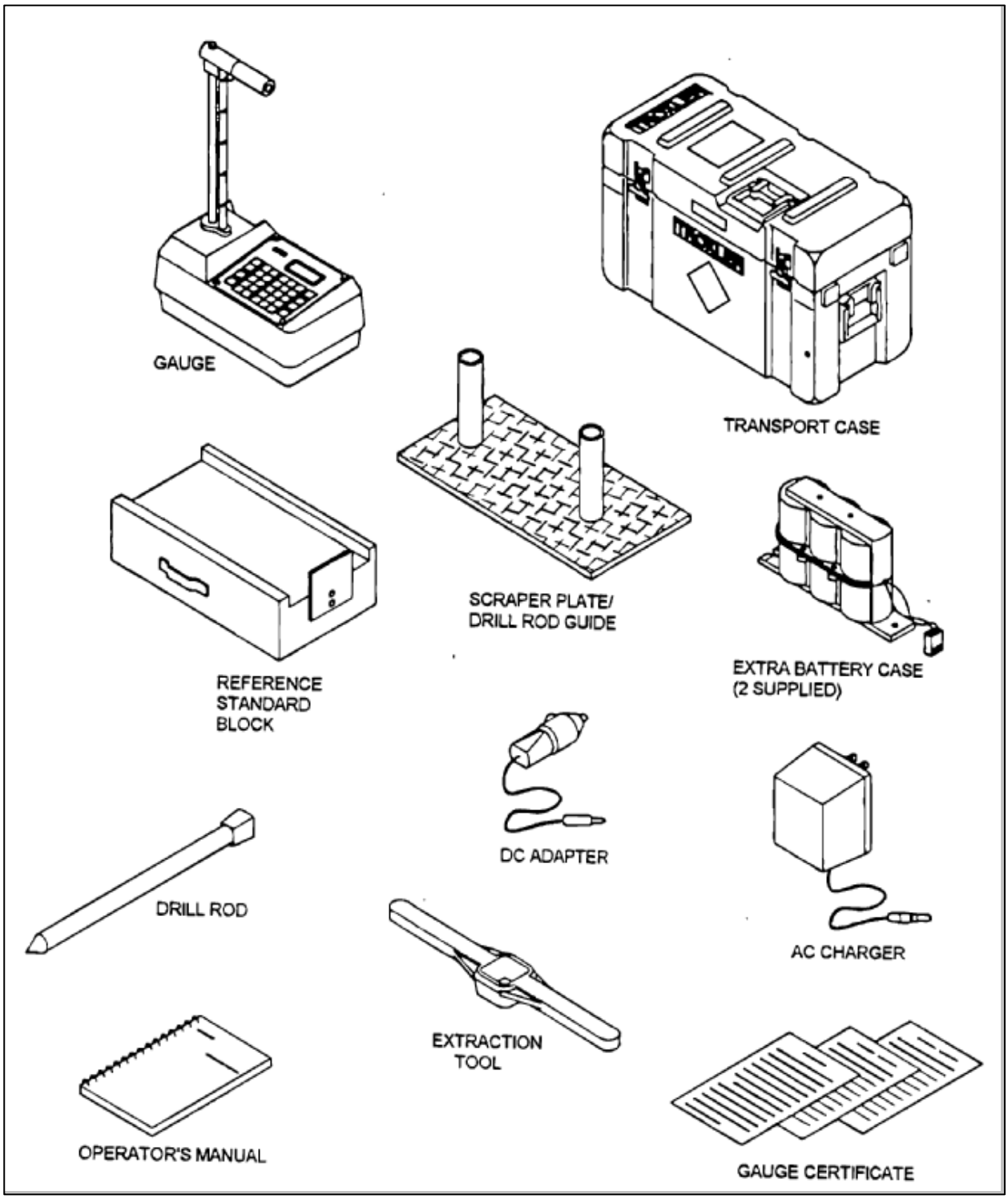
DIRECT TRANSMISSION GEOMETRY



DIRECT TRANSMISSION MODE

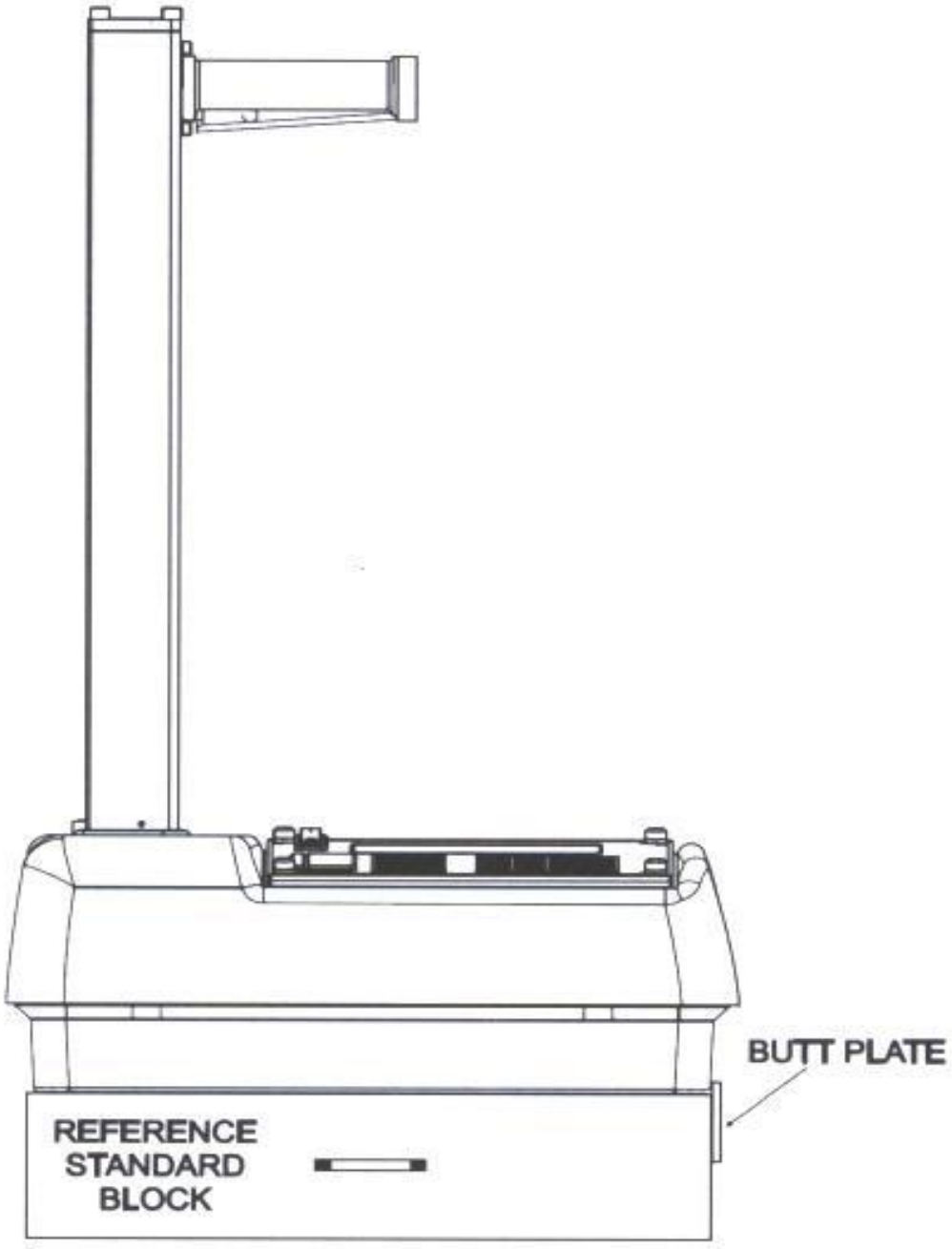


GAUGE & STANDARD ACCESSORIES



NOTE

Ensure that the source rod is in the standard (SAFE) position and is securely seated by *firmly* tapping down on the handle of the source rod.



STANDARD COUNT

NOTE:

Always take standard counts using the reference standard block provided with the gauge.

Before taking a standard count, ensure that the gauge base and reference standard block are dry and free of debris.

Choose a standard count site that meets the following criteria:

- A smooth surface such that the reference standard block does not rock
- At least 3 meters (10ft) from any large vertical surface
- At least 10 meters (33 ft) from any other radioactive source

Turn the gauge on. At the ***Ready*** display, press the <***STD***> key. The gauge displays the last standard counts for density (DS) and moisture (MS).

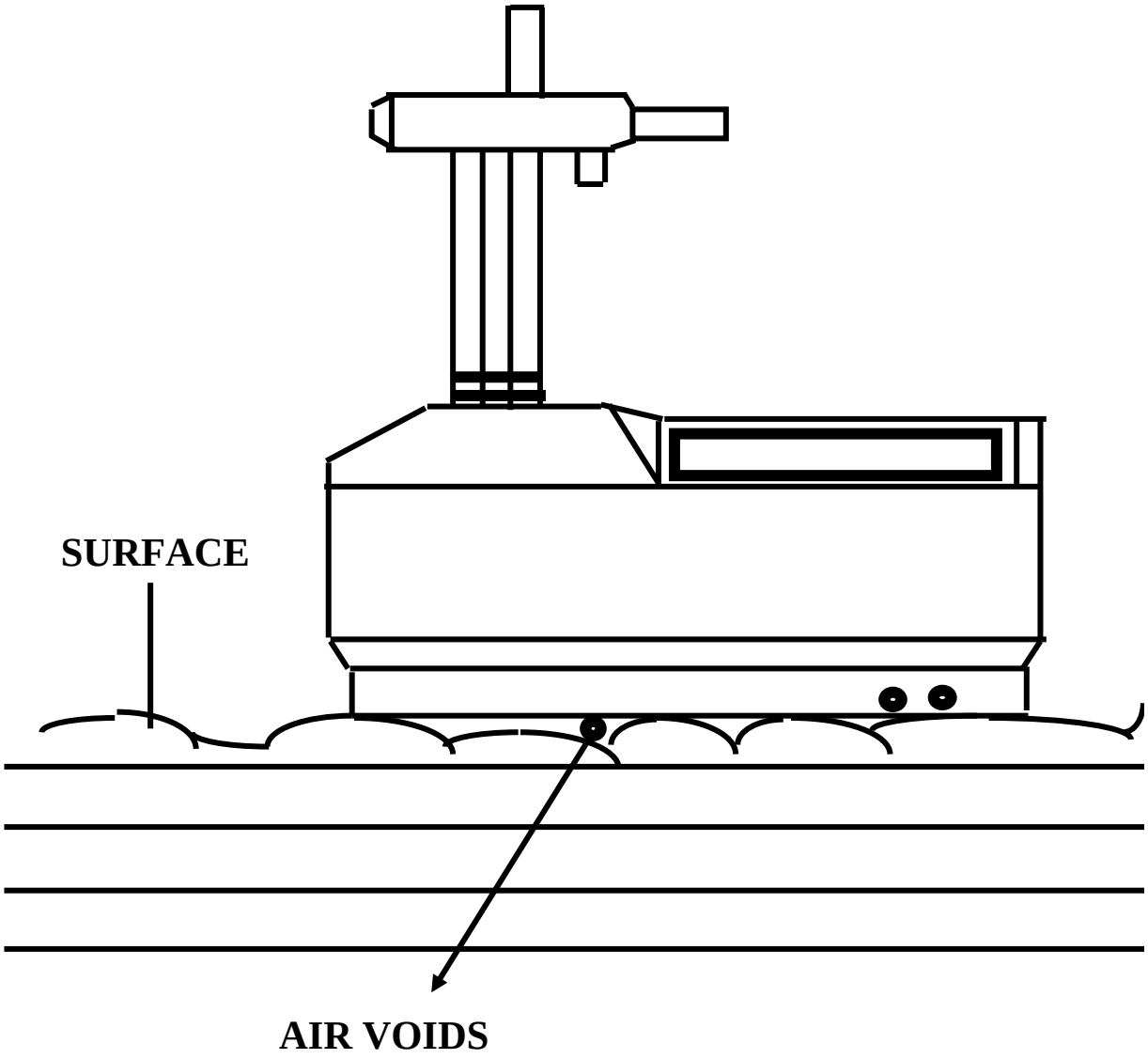
Standard Count
DS = ####
MS = ####
Take New Count?

NOTE:

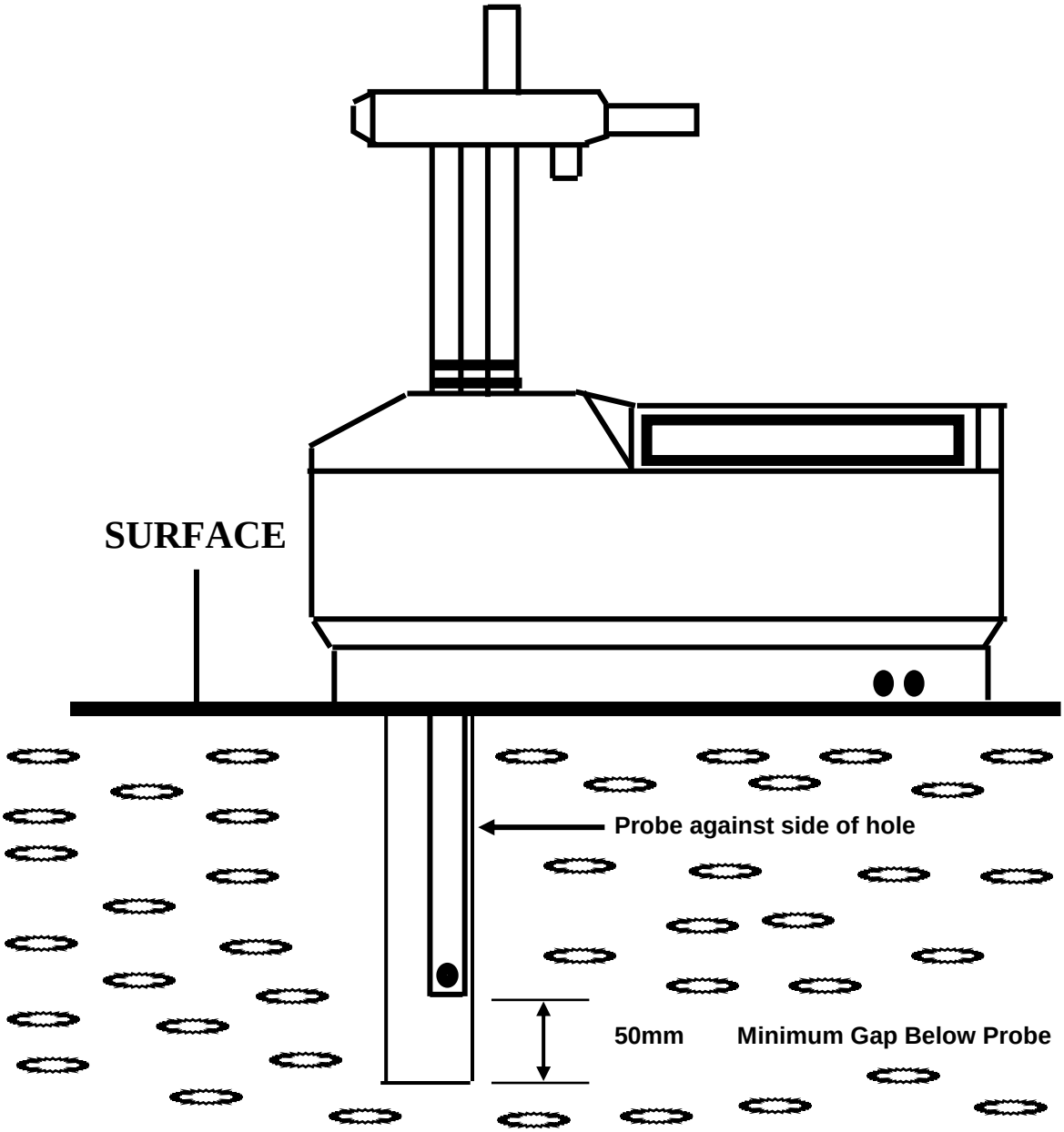
The <*STD*> key is active only when the Ready Screen is displayed.

- To take a new standard count, press <***YES***> .
- To view the last four standard counts, press <***NO***> .

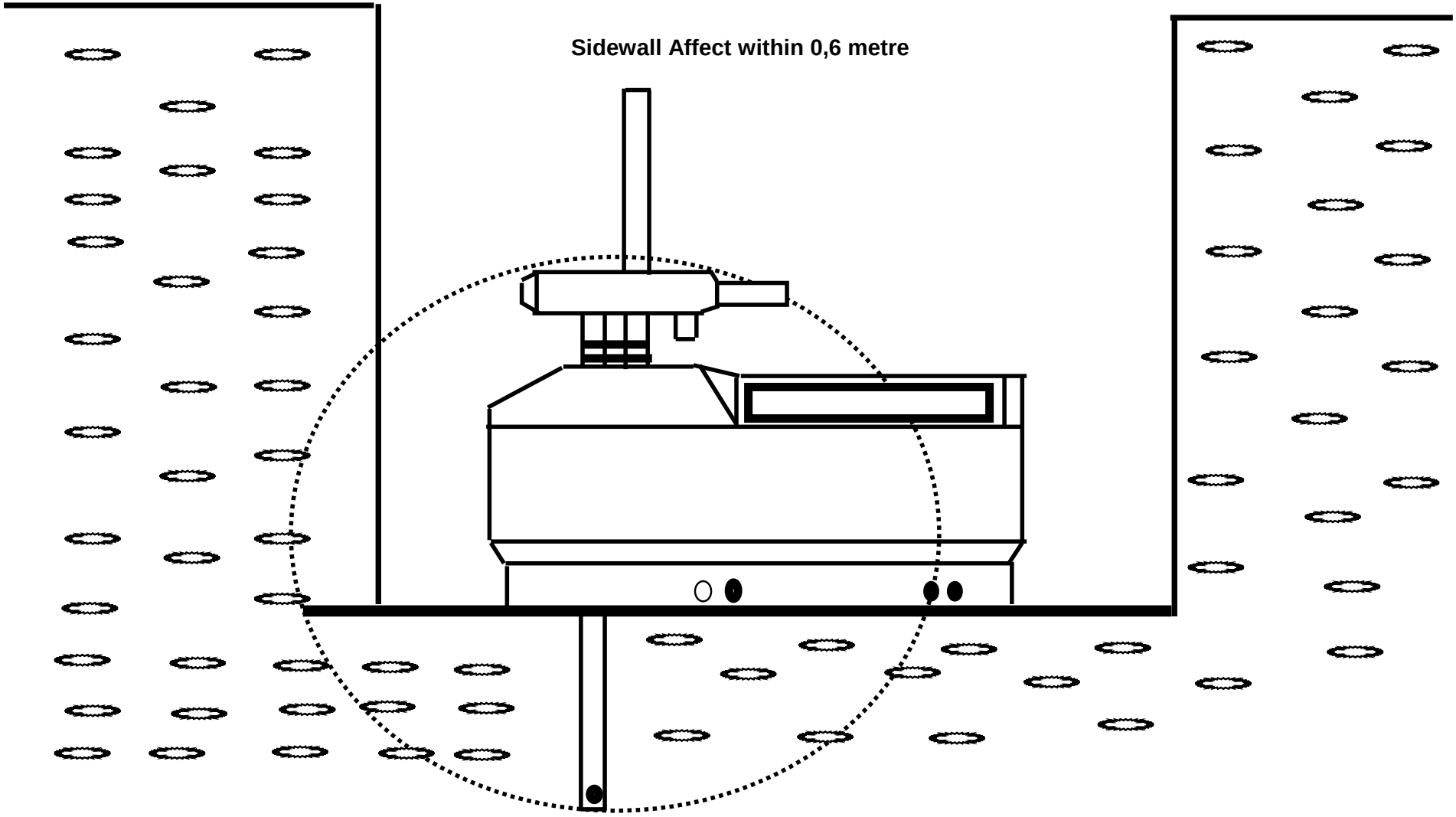
BEDDING



Criteria prior to taking a Measurement in Direct Transmission Mode



TRENCH MEASUREMENTS



MOISTURE CORRECTIONS FOR VARYING SOILS

MOISTURE:

The 3400 Series measures moisture by determining the hydrogen (H) content of the soil and relating this to water (H_2O) content. In some soils there are compounds other than water, which contain hydrogen. Also, there are elements in some soils, which absorbs = Hydrogen Atoms

To determine a correction factor, proceed as follows:

1) Take five or more oven dry and gauge sample pairs. Be sure oven dry samplers are at least 1000-2000 grams taken under the center of the gauge to a depth of 15-20 cm or 6-8 inches. Be sure nuclear tests are taken with the Moisture Correction set at ØØ on

2) Prepare a chart as shown below.

Sample No.	%M Oven Dry	%M Gauge	%Oven Dry - % Gauge
	4.5	8.6	-4.1
2	4	5.8	-1.8
3	7.2	9.7	-2.5
4	6.7	8.6	-1.9
5	5.1	7.3	-2.2
Average	**5.5**	**8**	**-2.5**

The difference between the oven dry and the gauge samples is expected to vary from sample to sample due to normal variation. If the difference indicates the gauge is sometimes higher and sometimes lower than the oven dry, no correction may be needed. If

Calculate the correction factor, using the average value, as follows:

$$\textbf{Correction Factor} = \frac{\textbf{\% M Oven Dry - \% M Gauge}}{\textbf{100 + \% M Gauge}} \textbf{ x 1000}$$

Dial this value into the Moisture Correction switches on the 3411B scaler, paying attention to the algebraic sign. In the example above, the moisture correction would be as follows:

$$= \frac{\textbf{-2.5}}{\textbf{100 + 8.0}} \textbf{ x 1000 = -23}$$

The correction is independent of dry density and wet density and adjusts the apparent moisture to a true moisture regardless of dry density. This value can be used for all future tests on the same soil type.

Occasionally, nonhomogeneous soils may be encountered in which differences between gauge and oven dry readings are not consistent between samples. In this case, one correction factor is not practical.

MODEL 3430 - KEYPAD

ON	↑	MA	STD	SPECIAL
YES		PR		
OFF	↓	TIME	DEPTH	START
NO				ENTER

TROXLER 3430
SPECIAL FUNCTIONS

RECALL

Enter

VOIDLESS DENS

OR Enter

OFFSET

Enter

SET UNITS

OR Enter

STAT TEST

Enter

CAL CONSTANTS

OR Enter

DRIFT TEST

Enter

MEMORY RESET

OR Enter

SPECIAL CALIB

Enter

TEST READING

OR Enter

SPECIFIC GRAV

OR Enter

LANGUAGE

OR Enter

TROXLER 3430 KEYPAD FUNCTIONS

KEYS	DESCRIPTION	PAGE
ON **YES**	**Turns on the gauge and answers *Yes* to prompts**	**3-6**
OFF **NO**	**Turns gauge off and answers *No* to prompts**	
↑	**Scrolls the display up.**	
↓	**Scrolls the display down.**	
MA **PR**	**Allows entering or enabling of a Proctor or Marshall value.**	**3-9**
TIME		**3-8**
STD	**Use to access the *Standard Count* mode.**	**3-10**
DEPTH	**Allows entry of the source rod depth**	**3-8**
SPECIAL	**Provides access to the *Special* functions.**	**3-7, 4-3, 4-4, 4-7, 5-1**
START **ENTER**	**Starts a measurement or completes answer entry.**	

TROXLER MODEL 3440

		STATUS	MODE	SPECIAL
YES EXIT	**NO / CE** C/CE	**7**	**8**	**8**
		PROJECT	PRINT	ERASE
STORE MS	**OFFSET** MR	**4**	**5**	**6**
		COUNTS	DEPTH	CALC.
PROCTOR / MARSHALL +	**TIME** -	**1**	**2**	**3**
		RECALL		
SHIFT x	**STANDARD** ÷	**0**	**.**	**START / ENTER**

TROXLER 3440 KEYPAD FUNCTIONS

KEYS	DESCRIPTION	PAGE
YES **EXIT**	**Answers display prompts** **Permits exit from the calculator mode.**	
NO/CE **C/CE**	**Answers display prompts / Clear last entry.** **Clears calculator entry.**	
STATUS **7**	**(SHIFT function) Displays status of gauge functions.** **Number Key**	**5-19**
MODE **8**	**(SHIFT function) Ashphalt or Soils selection.** **Number Key**	**5-20**
SPECIAL **9**	**(SHIFT function) Provides access to special functions.** **Number Key**	**6-1**
STORE **MS**	**Memory store function for the calculator mode.**	**5-13**
OFFSET **MR**	**Select measurement offsets.** **Memory recall function for the calculator mode.**	**5-2**
PROJECT **4**	**(SHIFT function) To enter, view, or erase a project.** **Number Key**	**5-22**
PRINT **5**	**(SHIFT function) Download data.** **Number Key**	**5-24**
ERASE **6**	**(SHIFT function) Erase data.** **Number Key**	**5-26**
PROCTOR / MARSHALL	**Proctor or Marshall value selection.**	**5-16**
+	**Addition sign for calculator function.**	
TIME **-**	**Select time interval for testing and measurement.** **Subtraction sign for calculator function.**	**5-12**
COUNTS **1**	**(SHIFT function) Displays the last reading.** **Number Key**	**5-26**
DEPTH **2**	**(SHIFT function) Selects depth mode.** **Number Key**	**5-27**
CALC. **3**	**(SHIFT function) To access the calculator mode.** **Number Key**	**5-29**
SHIFT **x**	**Activates all SHIFT function modes** **Multiplication sign for calculator mode.**	
STANDARD **÷**	**Provides access to standard count mode.** **Division sign for calculator mode.**	
RECALL **0**	**(SHIFT function) Recalls data for viewing.** **Number Key**	**5-27**
.	**Decimal point key.**	
START / ENTER **=**	**See manual text and index.** **Equals sign for calculator mode.**	

MODEL - 3440

SPECIAL MENU

SPECIAL FUNCTION
YES - Next menu
1 - STAT TEST
2 - DRIFT TEST

YES - Next menu
3 - RECOVER BASE
4 - KEYPAD DATA
5 - AUTO STATION

YES - Next menu
6 - SPECIAL CALIB.
7 - NOMOGRAPH
8 - PRECISION

YES - Next menu
9 - SET UNITS
10 - BAUD RATE
11 - COMM PROTOCOL

YES - Next menu
12 - BATTERY
13 - SOURCE DECAY
14 - SPECIAL RDWY

SAFETY PROCEDURES ON TROXLER NUCLEAR GAUGES ONLY

USE OF GAUGE:

1. The Radiation Protection Officer shall ensure that all persons handling the gauges are familiar with the correct operating procedures.
2. Don't expose the source rod other than when measuring in the direct transmission mode.
3. Don't move or carry the gauge by placing your hands underneath the gauge.
4. Don't place the gauge on your lap when moving from one test position to another while travelling in a vehicle.
5. Always keep the Troxler in its transport case with the trigger mechanism locked when it is not being used.
6. Carry or move the gauge using the gauge handle.
7. A red flag must be mounted on a yellow and black striped pole so as to be clearly visible to all operators of vehicles or earthmoving equipment.

TRANSPORTING THE GAUGE:

1. When transporting a Troxler Moisture / Density Gauge by road, 3 x radioactive removable warning signs must be displayed on the vehicle.

   One sign on either side (door) of the vehicle, and one sign on the back of the vehicle.

   The name and telephone number of the person to be contacted in the event of an emergency must appear adjacent to each sign.

   These signs must be removed when radioactive matter is not being transported.

2. An enclosed vehicle must be used for day-to-day transport of the gauge. If a bakkie is used, a lockable canopy must be installed and the gauge must be secured to the vehicle.

3. A vehicle may not be left unattended with the gauge in (or on) it.

4. If the gauge is going to be used outside South Africa, all the necessary documentation (dangerous goods form) as well as an export authority must be acquired prior to shipment.

STORAGE:

1. No radioactive material or instrument or apparatus containing such material may be stored on any premises zoned for domestic purposes.

2. When in storage the source assembly must be locked in the "off" or fully shielded position.

3. Warning signs, of a design approved by the Department, must be displayed at the entrance to the storeroom or storage area to indicate the presence of radioactive material. The "trefoil" symbol must appear on the sign, as it should also include the working "Danger - Radiation".

4. Dose rates outside the store should not exceed 2.5 uSv/h (0,25 mR/h).

5. A notice containing the names and telephone numbers of the persons who can be telephoned in the event of an emergency, must be displayed at all storage facilities for radioactive material.

6. The storage facility must be lockable and unauthorised entry must be prevented.

7. A logbook must be provided in which the instrument/s must be signed into and out of the storage facility.

8. No radioactive material may be stored with, or in close proximity to any corrosive, combustible, or explosive materials.

9. In the case where an instrument must be stored in a laboratory the user must ensure that a distance of at least two meters be maintained between the instrument and the working area (or any place where people linger).

STANDARD COUNT LOG

Serial Number _____

DATE	MOISTURE - MS	DENSITY - DS

DATE	MOISTURE - MS	DENSITY - DS

NUCLEAR COMPACTION TEST DATA

PROJECT _____

JOB NUMBER _____

DATE _____

TAKEN BY _____

TEST NUMBER	1	2	3	4	5	6	7	8	9	10
STATION										
OFFSET										
ELEVATION										
MODE AND DEPTH										
DENSITY COUNT										
WET DENSITY										
MOISTURE COUNT										
MOISTURE										
DRY DENSITY										
% MOISTURE										
STANDARD DENSITY										
OPTIMUM MOISTURE										
% COMPACTION										
MOISTURE CORRECTION										

TEST NUMBER	11	12	13	14	15	16	17	18	19	20
STATION										
OFFSET										
ELEVATION										
MODE AND DEPTH										
DENSITY COUNT										
WET DENSITY										
MOISTURE COUNT										
MOISTURE										
DRY DENSITY										
% MOISTURE										
STANDARD DENSITY										
OPTIMUM MOISTURE										
% COMPACTION										
MOISTURE CORRECTION										

DENSITY	MOISTURE	REMARKS