The acceleration, in metres per second squared, due to local gravity with the accelerometer mounted at the angle (9 is:

$$aa = g1 \cdot \cos 6 \quad (1)$$

Where

6 is the accelerometer mounting angle, in degrees;

91 is the magnitude for the acceleration due to local gravity, in metres per second squared.

4.4 Accelerometer output measuring instrumentation

A voltage measuring instrument, measuring the output from the accelerometer, having the following characteristics shall be used:

a] Frequency: 0 Hz [DC voltage);

b] Maximum uncertainty: 0,05 % of reading.

4.5 Earth's gravitation

The positive and negative magnitudes for the acceleration due to local gravity, expressed in metres per second squared (m/szj, shall be used.

The value of the local magnitude of acceleration due to gravity, g1, can be determined by measurement with absolute or relative gravimeterslll] or by use of geodetic formulaellfi] or survey.

$$9105{,}14) = 9{,}780\ 318\ 4\ [1 + 0{,}005\ 302\ 4 \sin^2 (,0 - 0{,}000\ 005\ 9 \sin^2 2\ cp) - 0{,}000\ 003\ 086\ H \quad (2]$$

where

g] is the magnitude for the acceleration due to gravitation at the given latitude and elevation, in metres per second squared;

d) is the given latitude, in radians;

H is the given altitude, in metres above sea level.

Using Formula [2], Q1 can be determined with an expanded uncertainty of 0,02 % [k = 2).

If the magnitude for the acceleration due to local gravity is not known, then the standard acceleration due to gravity, gn, shall be usedl10]:

$$gn = 9{,}806\ 65\ m/s2 \quad [3)$$

5 Method

5.1 General

As the acceleration due to gravitation varies with location and altitude [typical values of acceleration due to local gravity at the locations of metrology institutes are within the range of 9,78 m/s2 to 9,83 m/sz), the local value with four significant digits shall be used.