FACE CONSULTANTS LTD
Global Flooring Consultants

FACE CONSULTANTS LIMITED

DIN 18202

FREE MOVEMENT SURVEYS

Further explanatory information

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Free Movement Surveys

Statement of the Method used to conduct a survey of a floor's surface regularity in accordance with DIN 18202

Table 3: Flatness tolerances

Column	1	2	3	4	5	6
Group	Applicable to	Position deviations (limit values), in mm, for distances between measuring points, in m, up to				
		0.1	1 *	4 *	10 *	15 * †
1	unfinished upper surfaces of floors, subfloors and concrete bases	10	15	20	25	30
2	unfinished upper surfaces of floors, subfloors and concrete bases subject to more stringent requirements (e.g. to receive floating screed, industrial floors, tile flooring and bonded screed), and finished surfaces for minor purposes (e.g. in storerooms or basements)	5	8	12	15	20
3	finished floors (e.g. screed as wearing courses or screed to receive a flooring, trowelled or bonded floorings)	2	4	10	12	15
4	As group 3, but subject to more stringent requirements	1	3	9	12	15
5	unfinished walls and unfinshed ceilings	5	10	15	25	30
6	finished walls and ceilings (e.g. plastered walls, wall claddings and linings, suspended ceilings)	3	5	10	20	25
7	As group 6, but subject to more stringent requirements	2	3	8	15	20

* Intermediate values shall be taken from figures 1 and 2, and shall be given to the nearest millimetre.

† The flatness tolerances in column 6 also apply to distances between measuring points of over 15m.

DIN 18202 Table 3 (represented above) details the allowable values of the properties of flatness.

Further queries on these specifications or on any other floor flatness issue can be answered by calling Face Consultants Limited direct on:
TEL: 01484 6000 90 FAX: 01484 6000 95 www.face-consultants.com

Copies of the 2003 edition of the Concrete Society's Technical Report No.34 (TR34) can be purchased through Face Consultants Limited, or direct from the Concrete Society on:
TEL: 01753 693313 FAX: 01753 692333

What is DIN 18202?

DIN 18202 controls the flatness by continuously calculating the deviation of the floor from 1.0m, 2.0m and 4.0m mean lines (the mean lines represent the straightedges defined by DIN 18202 Table 3). An easily legible graph is produced for each mean line – when the floor complies with the limits defined by the specification the graph is green and when it does not comply the graph is red.
How the deviation from the mean lines is calculated is explained over the following pages.

Test Instruments:

DIN 18202 specifies the maximum clearance permissible under various lengths of straightedge. It does not, however, specify how a survey to check compliance with these limits should be conducted. It can be checked using straightedges of the appropriate length or by using an optical level; but both of these processes are relatively imprecise and extremely laborious.
For continuous measurement of DIN 18202 the FACE DIN-meter (below) is used: the DIN-meter is a wheeled instrument that travels across the floor taking continuous readings as it does so.

As DIN 18202 does not specify how many tests should be conducted on any given area of floor, FACE Consultants have devised the following simple formula to calculate how many DIN-meter runs are necessary: the floor area in square-meters is divided by ten to give the number of linear-meters of the floor that the DIN-meter should be run on.

So, if the floor was 5,000m2 then it would be necessary to conduct DIN-meter runs of a total length of 500m: for example, 10 DIN-meter runs of 50m could be conducted, or 20 DIN-meter runs of 25m.

These runs are conducted in evenly spread random locations across the whole of the slab.

Once these runs have been have been conducted the floor can be checked to any of the DIN 18202 specifications.

Understanding the Summary Sheet:

Below is an example of the summary sheet of results from a FACE DIN-meter survey

The Category of DIN 18202 that has been tested is shown

The maximum deviation from the 1.0m, 2.0m & 4.0m mean line is shown

Summary Of Results

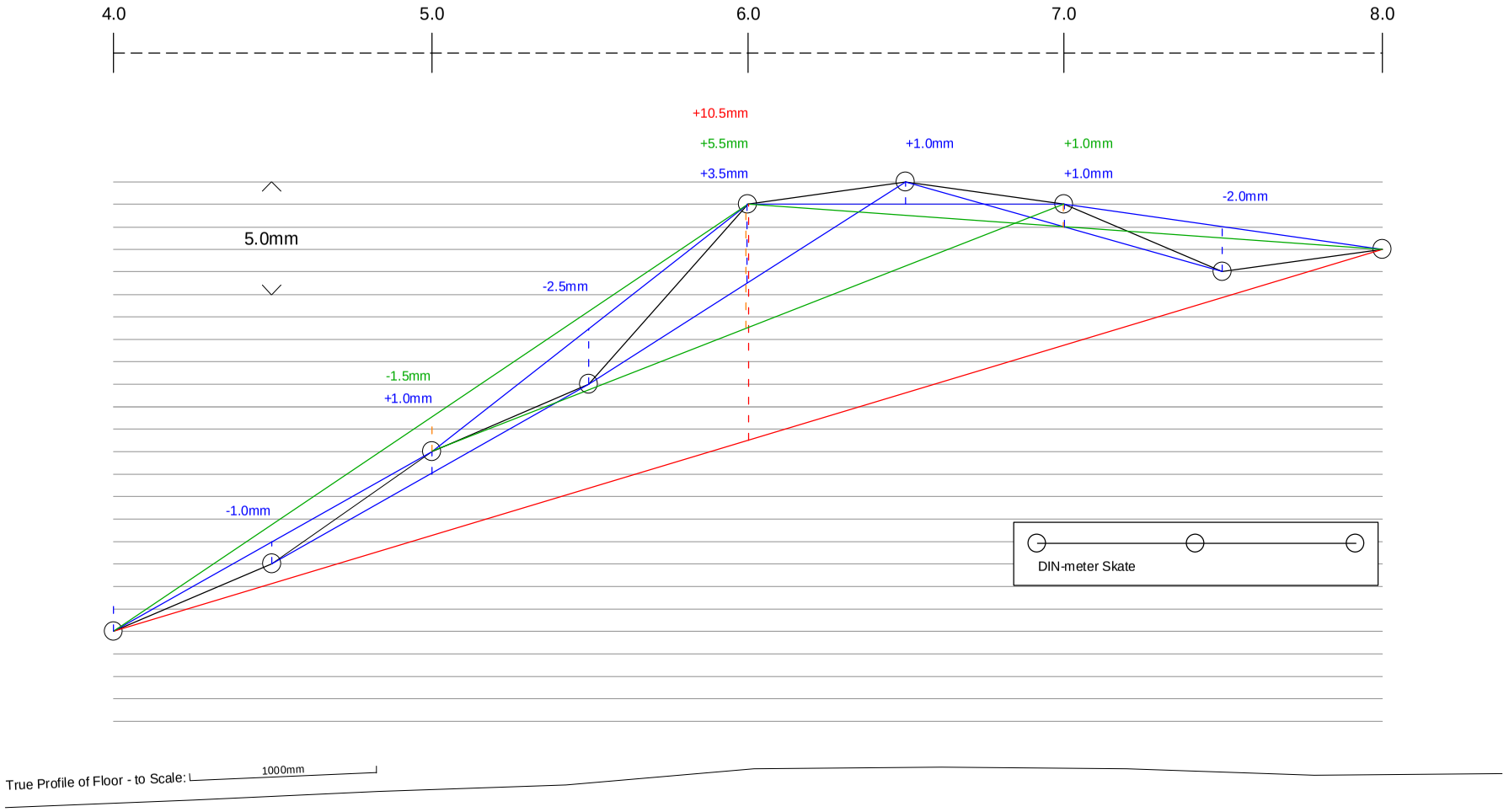
Job Name:	Job Name	Job Number:	FC/XX/XXXX
Location:	Location	Date:	DD/MM/YYYY
Surveyor:	Surveyor		

Specification	Description	Limit
Line 4	1 Metre Limit	3.0 mm
	2 Metre Limit	5.0 mm
	4 Metre Limit	9.0 mm

Run No.	Aisle Ref	Limits	Max Diff	Achieved	Run Length
1	1	1 Metre Limit	2.8 mm	100%	60.1 m
		2 Metre Limit	6.1 mm	99.3%	
		4 Metre Limit	7.1 mm	100%	
2	2	1 Metre Limit	3.4 mm	99.4%	60.1 m
		2 Metre Limit	5.1 mm	99.9%	
		4 Metre Limit	6.0 mm	100%	

The percentage of the aisle that exceeds the maximum permissible limit is shown in red:
For a run to comply with the required specification the percentage is shown in green and must be 100%.
The maximum deviation from each mean line is shown in black in the column “Max Diff”:
For the run to comply with the required specification the maximum deviation must not exceed the value given in the middle table of the summary page.
For a run to comply with the required specification there must be no deviation greater than the maximum limit on any of the mean lines - both of these runs fail to comply with DIN 18202 Line 4

How the Mean Lines are Generated by the DIN-meter

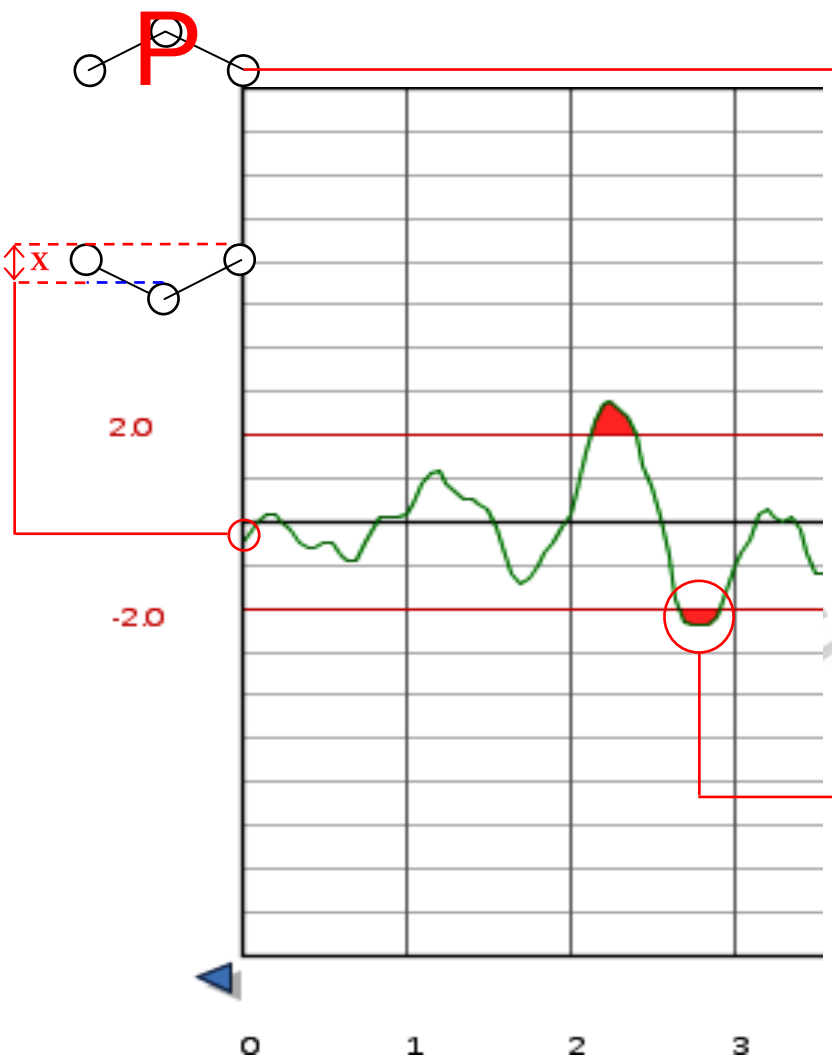


Indicates Mean 1.0m Lines — 1.0mm Indicates Deviation from Mean 1.0m Line

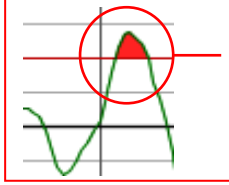
Indicates Mean 2.0m Lines — 1.0mm Indicates Deviation from Mean 2.0m Line

Indicates Mean 4.0m Line — 1.0mm Indicates Deviation from Mean 4.0m Line

Detailed Explanation of 1.0m DIN-meter Graph



Indicates position of the DIN-meter

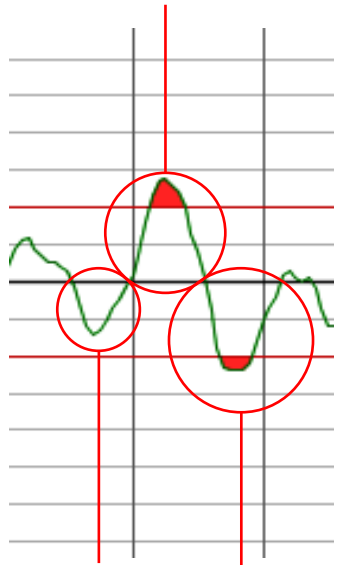


Where the graph is coloured red, the limits of the specification have been exceeded. The whole run fails to comply with the specification if any part of the graph is coloured red.

The 1.0m DIN-meter graph starts 0.0m from the start of the run.
X = deviation from mean 1.0m line - calculated using the 1.0m long DIN-meter the mean line is defined as being the 1.0m between the front and rear wheels of the skate, the deviation from that line is measured by sensors that monitor the vertical movement of the centre wheel (the centre wheel is at the mid-point of the mean line).

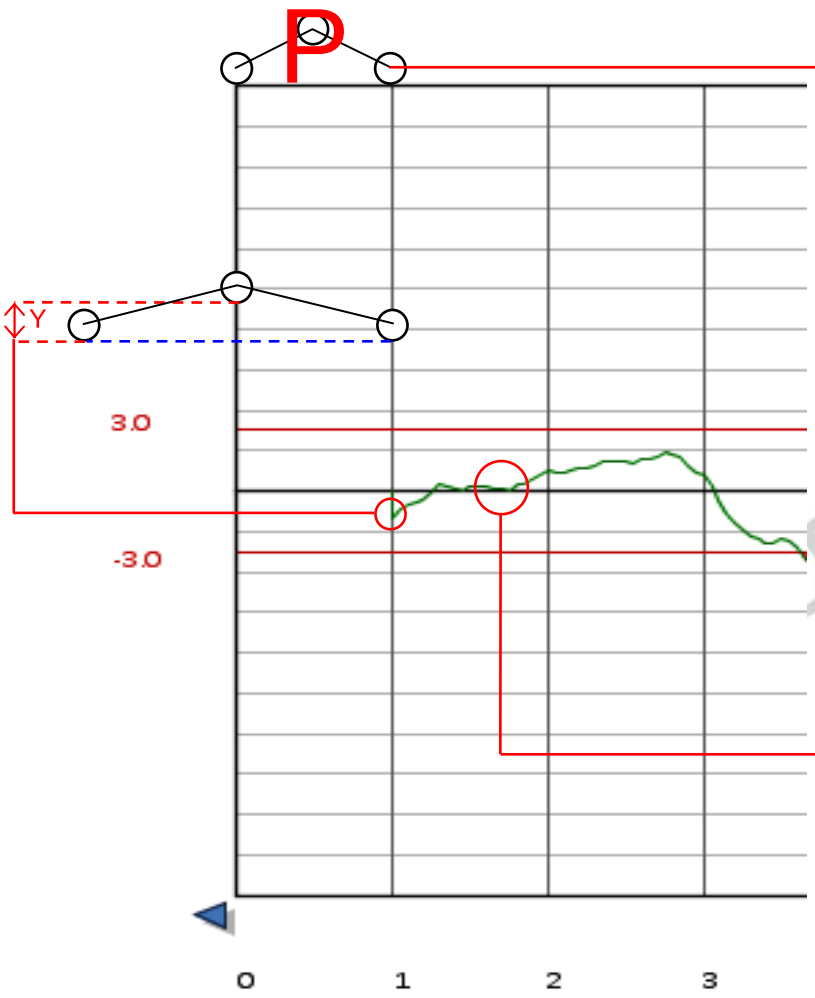
The deviation from a mean 1.0m line drawn back along the aisle from this point 2.75m from the start of the aisle is -2.3mm (i.e., 2.3mm below the mean line).

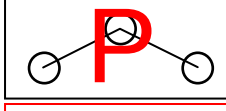
When the graph is above the centreline, the deviation is above the mean line.



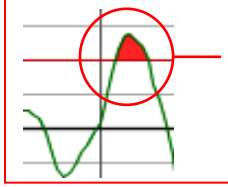
When the graph is below the centreline, the deviation is below the mean line.

Detailed Explanation of 2.0m DIN-meter Graph





Indicates position of the DIN-meter

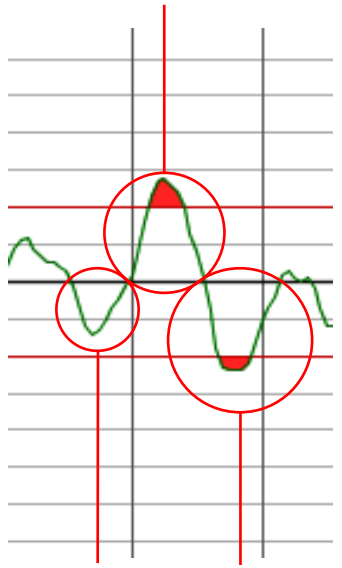


Where the graph is coloured red, the limits of the specification have been exceeded. The whole run fails to comply with the specification if any part of the graph is coloured red.

The 2.0m DIN-meter graph starts 1.0m from the start of the run.
Y = deviation from mean 2.0m line - calculated by the 1.0m long DIN-meter: the 2.0m mean line and the deviation from it are both calculated from two consecutive measurements, 1.0m apart, of the 1.0m mean line and the deviation from it (see overleaf for detailed explanation).

The deviation from a mean 2.0m line drawn back along the aisle from this point 1.70m from the start of the aisle is -0.0mm (i.e., neither above nor below the mean line).

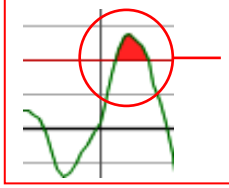
When the graph is above the centreline, the deviation is above the mean line.



When the graph is below the centreline, the deviation is below the mean line.

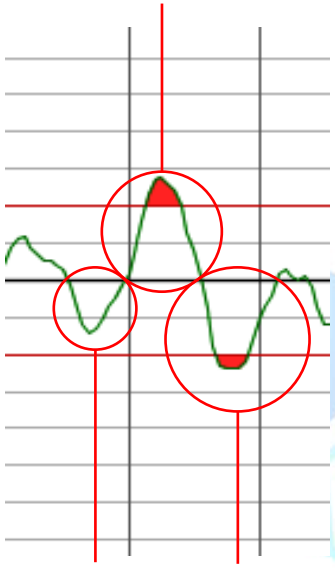
Detailed Explanation of 4.0m DIN-meter Graph

Indicates position of the DIN-meter



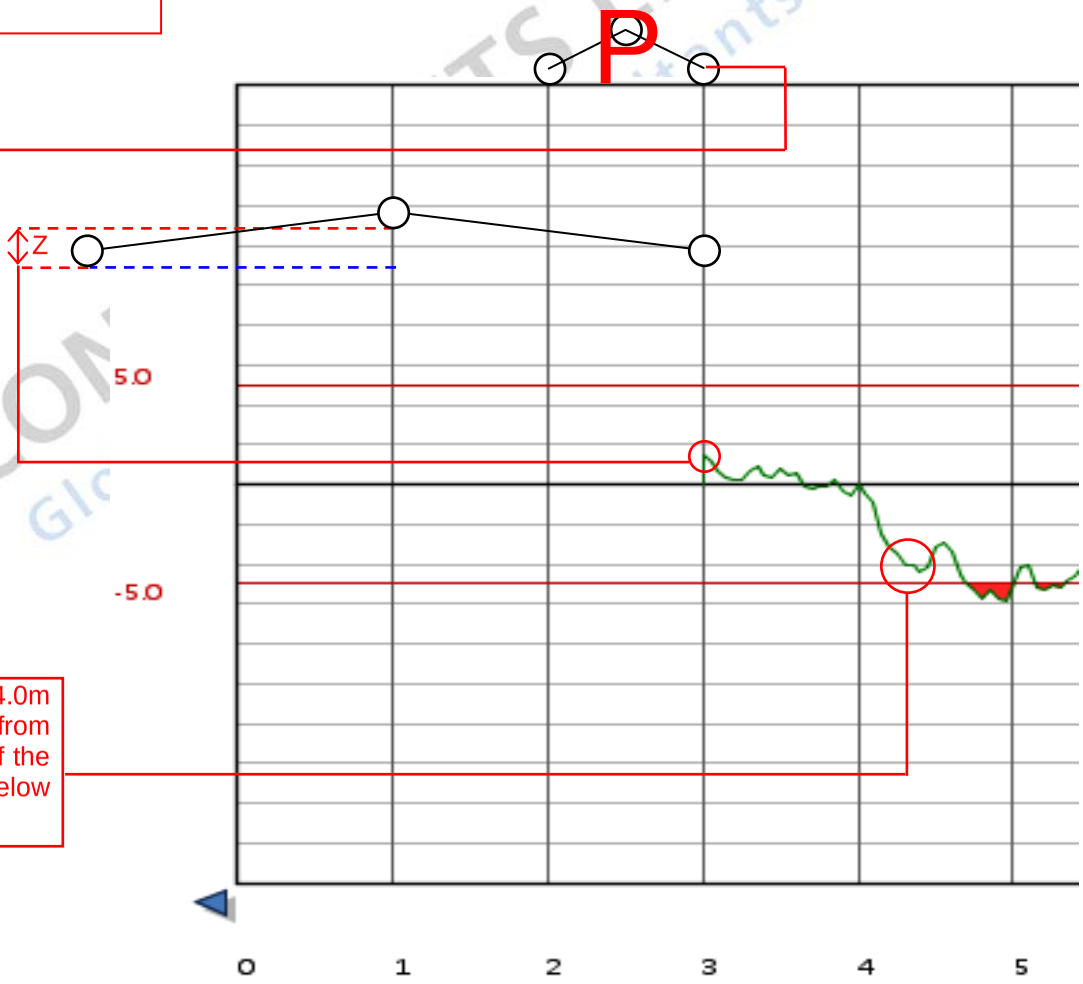
Where the graph is coloured red, the limits of the specification have been exceeded. The whole run fails to comply with the specification if any part of the graph is coloured red.

When the graph is above the centreline, the deviation is above the mean line.



When the graph is below the centreline, the deviation is below the mean line.

The 4.0m Longitudinal DIN-meter graph starts 3.0m from the start of the run.
Z = deviation from mean 4.0m line - calculated by the 1.0m long DIN-meter: the 4.0m mean line and the deviation from it are both calculated from four consecutive measurements, 1.0m apart, of the 1.0m mean line and the deviation from it (see overleaf for detailed explanation).



The deviation from a mean 4.0m line drawn back along the aisle from this point (4.3m from the start of the aisle is -4.0mm (i.e., -4.0mm below the mean line).