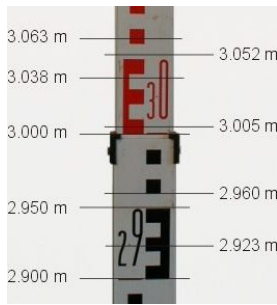


## Product Information Sheet Using a Staff with a Dumpy Level



This information may be of use to you and may lead you on to understanding more about geometry and surveying. Although it is properly used with a theodolite, the dumpy level also has stadia cross hairs.

### Spot Heights of a Site

You read off where the two large cross hairs meet.

So for this image your reading would be 2.22 or two metres twenty two centimetres.

Each 'block' represents one centimetre

Each E represents 5 centimetres

Each 10 centimetre section alternates back and forth and finally, on some staffs the colour alternates between black and red for each metre.

Now its time to take your initial reading. (for this example we will assume your temporary benchmark is set at 123.45 metres above ordnance datum .. maOD)



TBM                                    123.45  
 Backsight (BS)                    2.22 (the reading you have just taken)  
 Instrument Height (IH)        125.67 (add the TBM to the BS)

Now you can start to take readings for your site. Mark the location of your levels on the plan (or section string line) and the prepare to take the Foresight (FS) levels. Repeat the process of placing the staff on the ground where you have marked the locations on the plan....read off the height reading and then move onto the next..... your notebook should look something like this :

|                |        |
|----------------|--------|
| <b>TBM</b>     | 123.45 |
| <b>BS</b>      | 2.22   |
| <b>IH</b>      | 125.67 |
| <b>Point 1</b> | 1.67   |
| <b>Point 2</b> | 1.15   |
| <b>Point 3</b> | 1.26   |
| <b>Point 4</b> | 1.28   |

Now you have the readings, all you have to do is 'reduce' the levels. What you are doing is finding out the height of the ground at the base of the staff - in other words, as you know the height of the dumpy level all you have to do is subtract the staff reading to find out the actual height of the level on the ground. So in this case your finished levels notebook will look like this.

|                |        |        |
|----------------|--------|--------|
| <b>TBM</b>     | 123.45 |        |
| <b>BS</b>      | 2.22   |        |
| <b>IH</b>      | 125.67 |        |
| <b>Point 1</b> | 1.67   | 1.24   |
| <b>Point 2</b> | 1.15   | 124.52 |
| <b>Point 3</b> | 1.26   | 124.41 |
| <b>Point 4</b> | 1.28   | 124.39 |

} Reduced Levels

**Calculating Distance**

This information may be of use to you and may lead you on to understanding more about geometry and surveying. Although it is properly used with a theodolite, the dumpy level also has stadial cross hairs. These are the two short cross hairs above and below the main cross.

Very simply, the distance between the two is multiplied by 100 to give you the distance from where you are to where the staff is. So once again, in this example (and here we will use the millimetres) the lower cross hair is at 2.163 and the upper is at 2.218 so difference is 0.055 metres.

Multiply this by 100 and the final distance is 5.50 metres.

