METHODS USED IN CONTINUOUS LEVELLING

• Collimation method or height of instrument

• Rise and fall method.

In collimation method height of instrument

HI = BS + RL

And reduced level

RL = HI − FS

At the end computation, the difference of the sum of BS and FS must be equal to the difference of first RL and last RL data recorded. Meanwhile in Rise and Fall method, a rise will occur when the staff reading is less than the reading on the proceeding station. The data recorded are also checked for correctness as above, but this time, rise and fall are used instead of BS and FS.

TRAVERSE DURING LEVELLING:

Definition:

A traverse is a continuous frame work of line connecting a number of points, the lengths of the lines and their angular relationship to each other being measured. The lines are known as legs and the points as stations.

USE

Traverse surveys are used where site conditions make the chain triangulation method impossible e.g where the survey is of as large area and details are not required.

TYPES:

1) Closed traverse – when the frame work form a closed figure (or when the traverse connects two stations whose position are known). This type of traverse is used for surveying lakes or other areas across which known check line can be run. Such traverse is easily checked, as the survey starts and finishes at the fixed points.

2) Open traverse – a traverse whose starting and finishing stations do not coined or are not both fixed or known points. This type of traverse is used to survey rivers e.t.c. To enable the work to be checked, sights are taken on to some reference objects, such as well defined landmarks

Note:

a) Chain traverse √

b) Compass traverse √

c) Theodolite traverse √

Terms:

a) Bearing – the term bearing refers to the angle between the line and the north -south line or median.

b) Whole - circle bearing - the bearing from north to the leg is measured in a clockwise direction and the angle from the north line right round to the leg is know as a whole – circle bearing (as W.C.B)

A N

N N

A

WCB

O Of

WCB OA

O Of WCB

OA O of OA

A

Forward and Back Bearing: with A as the starting station of traverse and the direction of the survey being forward B, the angle between north and AB at A is known as the forward bearing of AB. The angle between north and AB at station B is known as the back bearing of AB, this should differ from the forward bearing by exactly 180_0.

The forward and back bearings of a leg will differ by 180_0 except there is local attraction. The presence of metal, metallic ores or electric currents will divert the compass needle from the north– south line, and thus cause the readings taken to be inaccurate. Stations should therefore be chosen so that they are beyond the influence of this attraction.

Correction for Effects of Local Attraction:

Line Bearing Diff of FB and BB

AB 60° 180°

BA 240°

BC 120° 180°

CB 300°

CD 210° 178° (-2°)

DC 32°

DA 317° 182° (-2°)

AD 135°