Advantages and Disadvantages of Auto Level

Auto level is a leveling instrument used in surveying. The ease of use of Auto level has made it popular among surveyors. the major advantages and disadvantages of the auto level are provided below.

Advantages of Auto Level

- Auto level is very easy to use.
- No adjustment for staff reading is required in auto level as the actual reading is seen from the eyepiece.
- The bubble can be adjusted from any side and any angle with any 3 screws available.
- The auto level has an internal compensator mechanism which automatically adjusts the line of sight.
- The measurement accuracy of the auto level is higher.
- Auto level results are very reliable.
- Ease of use of auto level saves time and money.
- The price of the auto level is low and affordable.

Chain Surveying | Definition, Details, Procedure

Chain survey/surveying is a very old method of Surveying. This article includes the definition of chain survey along with all detailed information with necessary images about various aspects of chain surveying.

The chain survey is the simplest method of surveying. In the chain survey, only measurements are taken in the field, and the rest work, such as plotting calculation, etc. are done in the office. Here only linear measurements are made i.e. no angular measurements are made. This is most suitably adapted to small plane areas with very few details. If carefully done, it gives quite accurate results.

The necessary requirements for fieldwork are

- Chain
- Tape
- Ranging-Rod
- Arrows
- Cross staff

Suitability of Chain Survey

Chain survey is suitable in the following cases:

1. The area to be surveyed is comparatively small
2. The ground is fairly level
3. The area is open and
4. Details to be filled up are simple and less.

Survey Station

Survey stations are of two kinds

1. Main Stations
2. Subsidiary or tie

Main Stations

Main stations are the end of the lines, which command the boundaries of the survey, and the lines joining the main stations recalled the main survey line or the chain lines.

Subsidiary or the tie stations

Subsidiary or the tie stations are the points selected on the main survey lines, where it is necessary to locate the interior detail such as fences, hedges, building, etc.

Tie or Subsidiary Lines

A tie line joints two fixed points on the main survey lines. It helps to check the accuracy of surveying and to locate the interior details. The position of each tie line should be close to some features, such as paths, buildings, etc.

It is the main and longest line, which passes approximately through the center of the field. All the other measurements to show the details of the work are taken with respect to this line.

Check Line

A check-line also termed as a proof-line is a line joining the apex of a triangle to some fixed points on any two sides of a triangle. A check-line is measured to check the accuracy of the framework. The length of a checking line, as measured on the ground should agree with its length on the plan.

Offsets

Offsets are the lateral measurements from the baseline to fix the positions of the different objects of the work with respect to the baseline. These are generally set at right angle offsets. It can also be drawn with the help of a tape. There are two kinds of offsets:

1. Perpendicular offsets
2. Oblique offsets.

The measurements are taken at a right angle to the survey line called perpendicular or right-angled offsets. For setting perpendicular offsets any one of the following methods is used:

- Swinging
- Using cross staffs
- Using optical or prism square

Perpendicular Offset by Swinging:

The chain is stretched along the survey line. An assistant holds the end of the tape on the object. The surveyor swings the tape on chain line and selects the point on the chain where offset distance is the least (Fig. 12.13) and notes chain reading as well as offset reading in a field book on a neat sketch of the object. Perpendicular Offsets Using Cross Staffs.

Figure 12.14 shows three different types of cross staffs used for setting perpendicular offsets. All cross staffs are having two perpendicular lines of sights. The cross staffs are mounted on a stand. The first line of sight is set along the chain line and without disturbing setting right angle line of sight is checked to locate the object. With open cross-staff (Fig. 12.14 (a)) it is possible to set perpendicular only, while with french cross-staff (Fig. 12.14 (b)), an even 45º angle can be set. Adjustable cross-staff can be used to set any angle also since there are graduations and the upperdrum can be rotated over a lower drum.

Field Book

All observations and measurements taken during chain surveying are to be recorded in a standard field book. It is an oblong book of size 200 mm × 120 mm, which can be carried in the pocket. There are two forms of the book

i. single line
ii. double line.

The pages of a single book are having a red line along the length of the paper in the middle of the width. It indicates the chain line. All chain-ages are written across it. The space on either side of the line is used for sketching the object and for noting offset distances. In the double line book, there are two blue lines with a space of 15 to 20 mm in the middle of each book. The space between the two lines is utilized for noting the chain-ages. Figure 12.17 shows typical pages of field books.