

CIV2202.8: SURVEY METHODS

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PREVIEW

Introduction

In this chapter you need to understand about **bearings** and how and why to establish **control points**.


For an engineering project the following steps occur: The arrows indicate the progression of activities.

Data collection (site survey)
 ê **Design** (additional surveys)
 ê **Setting out** survey
 ê **Construction** surveys
 ê **As-built** surveys

Objectives

After completing this topic you should be able to :

Readings

	<i>Read Muskett, Chapter 5</i>
REQUIRED	

SITE GRID

For an Engineering project, a coordinate grid is usually defined for the site. **North** may be aligned with :

- (i) true north
- (ii) magnetic north
- (iii) arbitrary (convenient direction).

COORDINATES

All points are given coordinates, so errors are more easily found, and plotting doesn't depend on an angle measuring device (although this is not a problem with computer aided drafting).

On a large project a grid will be drawn on all plans, at some suitable spacing (50 m, 100 m etc).

Usually an origin is chosen so that all co-ordinates are positive (eg. make SW point (50 000 m, 50 000 m)).

WHOLE CIRCLE BEARINGS

We've seen already that for any line AB, the bearing of AB = bearing of BA + 180°. Always reduce bearings to values between 0° and 360° by adding or subtracting 360°.

3 SURVEYING PHASES

Surveying works from the large to the small.

1. establish accurate primary control
2. establish several secondary control points within the project area to which other measurements can be referred.
3. work from these points to measure detail, and later to set out the works.

CONTROL FRAMEWORKS

In general, there is a hierarchy of control frameworks; each less accurate than the one above. Work downwards from primary control.

Primary control framework is made up of Horizontal control (for Plan locations) and Vertical control (for levels).

BASIC METHODS OF HORIZONTAL CONTROL

1. **Traverse** - measuring angles and lengths around a polygon, which we've already discussed.
2. **Triangulation** - measuring angles and lengths of triangles.

TRIANGULATION

Measuring sides and angles of triangles.

Angles can be accurately measured over large distances. Only some lengths need to be measured if all angles are measured.

Two triangulation points for Melbourne are on the top of the Menzies Building at Monash.