Drawing Longitudinal & Cross Sections

You are probably used to sections on Architectural or Structural drawings. The purpose of these sectional drawings is to graphically display the building at the place the section is taken.

As we can see in Figure 1 the section shows us that the building has,

- 4 levels
- deep piers
- columns

The sections you will develop for this subject serve a similar purpose, they will allow you to graphically view the land at any point you require. From this information you can design your proposed structure and give a graphical representation of the proposed works.

These sections will also assist you to derive volumes for earthworks.

There are two sections that we develop to give us “sections of the land”.

1. **Longitudinal Sections** - Also known as Long Sections, these are a section through the longest length of the subject land.
2. **Cross Sections** – These are section across the narrowest length of the subject land or works.

These definitions derive from there primary use in civil works in particular in road design and construction. A Longitudinal Section is a section along the direction of the road. A Cross Section being a section across the road.

For our purposes the way we treat them is identical and the only reason I will still refer to Longitudinal Sections & Cross Section is that is in the industry norm.
Longitudinal Sections

The method to draw Longitudinal Sections is exactly the same as you draw a section on an Architectural section.

You draw construction lines vertically to give a profile of the important features of the house. You then draw in the vertical heights by measurement.
Longitudinal Sections are drawn in a similar manner, the major difference being:

1. Notations on the Drawing are in a format to convey information.
2. The Horizontal scale is usually greater than the Vertical scale
   e.g. Horizontal Scale 1:100
   Vertical Scale 1:10

Draw a section through grid 3.
Notations on the Drawing

**RL 100.000** – is the origin for vertical dimensions for the drawing.

**Chainage** – is the horizontal measurements from the origin.

**Existing Ground Level** – the ground level

**+/− above Datum** – Is the height above the origin in this case RL 100.000
After this drawing is drawn up you can start the design work. Let us say that the site is going to be levelled to a Reduced Level of 100.500. This is referred as design level.

We would add this to the drawing as follows.
Notations on Drawing

**Design Level** – Is the finished level required.

**Cut** – Noted on this line if the existing ground is higher than the design level.

**Fill** – Noted on this line if the existing ground is lower than the design level.
Cross Sections are drawn exactly the same way. The only difference is that the title is “Cross Section – Grid D”. Chainage is measured from the centre. A Cross Section at Grid D would be drawn as follows.
The same method is used to draw the cross sections with the design level.
You can also generate longitudinal & cross sections from contour drawings. This is done in a similar manner as the previous examples. The only difference being that the spacing of the measurements is not even. In this case they are positioned by the intersection of the contour line & the position of the section.

To draw a section from a contour drawing,

1. Draw a line across the part of the drawing you want to view the section. Note in this case it is a longitudinal section.
2. Extend construction lines from the intersection of your section line and contour lines.
3. Calculate and notate the drawing as previous, note that the chainage is not an even spacing but determined by the intersection of the section line & the contour.
4. Next you notate on the drawing design levels. Say in this case you need to level to site to RL 100.500 you can notate this on the drawing. This is commonly referred to as the formation height.

5. You can also show the required cut or fill

6. Calculate and notate the drawing
Ground Level must be interpolated.

The interpolated level should be rejected as it is greater than the contour interval.
7. There is no reason why you can’t take a section across the subject block of land at any point and at any angle.
Longitudinal and Cross Sections can be used to give a representation of proposed works.

Draw the ground level from last week’s garage example.