Designing with Contours: Reading, Drawing and Transforming Landform.
Harvard GSD Career Discovery 2012.
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**Slope**: The steepness, incline or grade of a line. A higher slope value indicates a steeper incline. Slope is defined by the rise over the run or y/x values of two points on a line. Rise is equal to the change in height or 'y' direction while run is equal to the change in length or 'x' direction.
Designing With Contours: Basic Definitions.

- spot elevation
- contour line
- contour interval = 1 ft

- run: 1 inch
- rise: 53.2 - 50.4

slope = rise/run = 2.8/20 = 0.14 = 14% slope

scale 1 inch = 20 foot
Designing With Contours: Characteristics of Contour lines.

All points on a contour line have the same elevation.

Every contour closes on itself either within or beyond the limits of the map. If it closes beyond the limits of the map it will run to the map edge.

A contour which closes on itself within the limits of a map is either a summit or a depression. They can be distinguished by marked spot elevations at the low point (LP) or High point (HP).

Contours which are equally spaced indicate a uniform sloping surface.

Generally contours that are close together indicate a steep slope while contours spaced far apart indicate a shallow slope.

On a convex slope the higher contours are spaced farther apart than the lower contours.

On a concave slope contours the lower contours are spaced farther apart than the higher contours.

Valleys are indicated by contours pointing uphill. In crossing a valley with a stream at the bottom, the contours run up the valley on one side, turn at the stream and run back down the other side.

Contours never split; however, occasionally you will see two contours numbered the same side by side. This indicates a high or low point.

Water flows along slope perpendicular to the contour and along the shortest distance between contour lines (steepest area).

Contour lines are labeled with the elevation on the high side of the line.
contours do not split.
Contours are always closed lines.

incorrect

34 35 36 37

34 35 36

correct
contours do not overlap, except in the case of an overhang
Designing With Contours: Transformation

existing contours should be drawn with a dashed line.

proposed contours should be shown as a solid line.

proposed contours should always begin at an existing contour, move away from it to create the new form the return to meet existing contour at the end of the proposed change.

proposed contours should always tie in to the existing contours at or before the edge of the drawing/map/plan. (ie...the existing topography adjacent to the site cannot be changed. It must be met and manipulated only within the space of the drawing/map/plan.)
incorrect. contours do not meet existing contours at the site edge.
**Designing With Contours: Slope**

Slope indicates the steepness of a given surface and can be expressed as either a ratio or a percentage.

The slope of a surface can dramatically alter the experiential and performative aspects of a surface.

The slope of a given surface is an important factor in determining the program and material of that surface. Every material has an angle of repose, or slope at which it is resting at the steepest angle possible. At this angle the material is at the point between stability and sliding. The angle of repose is determined by the density, surface area, friction coefficient and shape of the material particles.

Simple rules for slope requirements for various activities and materials can be found in “Time-Saver Standards For Landscape Architecture” (Charles Harris and Nicolas Dines.)

![Diagram of a hill with slope and ratio calculations]