

Surveying is the art and science of knowing the relative positions of objects above, on or beneath the Earth's surface. The leveling techniques -- both direct leveling (differential leveling) and trigonometric levelling -- vary depending on the circumstances and accuracy requirements. In contrast to other methods of surveying which may be limited to positioning only in one direction, levelling is geared toward vertical control and height determination. Levelling is critical in many engineering functions, from laying foundations, making grades for roads and railroads, drawing drains, and producing topographic maps. Surveying includes a large range of tasks, ranging from setting up control networks for large scale projects to small-scale site surveys of individual buildings. Modern surveying practices tend to use technologies such as GPS, total stations and laser scanning, making it more accurate and efficient than traditional surveying practices. But basic surveying concepts, such as error propagation and coordinate transformations, need to be understood in order to achieve precise, reliable results. These measurements are then processed to create maps, plans and models of the actual landscape with amazing accuracy.