The underground soil corrosion of steel has been investigated in this research. This form of corrosion has a significant impact on many industries and products including pipelines, pylons, and power poles, and, currently, lacks research and a clear understanding. It is being proposed that this corrosion is due to the formation of differential aeration cells, caused by varying oxygen concentrations across a metals surface which arises most commonly as a result of either varying soil porosities, or the water table covering only part of the steel structure. Two prototype cells have been designed and constructed which were used to measure the corrosion rate of mild steel over varying depths in a soil environment through a direct measurement of the current flow between electrodes. From the experiments it was found that there was reversal of currents to cathodic values above the water table and to anodic values below the water table. Addition of salt increased the corrosion rate significantly. The cell will be used for long term field measurements that will aid design of structures in corrosive environments.