



A Digital Terrain Model (DTM) or cross-sections are required to be taken on borrow pits before and after excavation for determining the quantity of material removed. Original or preconstruction measurements should not be taken until any required clearing and grubbing has been completed and unsuitable materials have been removed from the pit area. Measurements may be taken either before or after topsoil is removed, as deemed necessary by the engineer.

If cross sections are taken, they should be taken from a base line established along the side of or through the borrow pit. If practicable, the base line should be at right angles to the general slope of the ground or parallel to the major axis of the pit. One or more hub and tack stakes should be set at each end of the base line, well away from the area to be excavated, where they will not be disturbed. These hubs should be so referenced that they can be located and the base line accurately re-established upon completion of pit excavation.

The base line definition should be recorded along with the cross section data for comparison of computations. When practical, the sections should be taken using the same horizontal datum as used for the project. The cross sections should be taken at intervals not exceeding 50 ft and at closer intervals as required to accurately show the contour of the entire area. With the approval of the engineer, cross sections may be taken at 100 ft intervals when the original ground and the finished borrow pit do not show sharp breaks in elevation. When practical, levels should be run using the same vertical datum as used for the project; otherwise, two bench marks should be set with reference to an assumed vertical datum.

If the borrow pit volumes will be computed from a DTM collected in the field, readings should be taken along discontinuities (top of ridges, around the base or top of mound, etc.), at high points, at low points and at a predetermined grid interval, to best model the surface.

A sketch of the original pit layout should be entered in the field notebook. The sketch should show topographical features such as trees and buildings, and should indicate the magnetic bearing of the base line, the limits of the sections, and all hubs and ties necessary for re-establishing the base line and/or control points.

If original measurements were taken before to the removal of topsoil, the final measurements cannot be taken until the topsoil has been replaced.