

Excavation for Tanks and Basins

Digging tank holes, sewer lines, basins for wetlands and lagoons are just a few of the common excavation tasks for DEWATS. Correct procedures will save time and money, keep workers safer and lead to long term sustainability of your system.



Shoring installed to protect workers that must enter an excavation. Shoring may add some expense and time to a project, but ensuring the safety of workers is more important. Always shore excavations deeper than 1.3 meters if workers must enter the hole.



Hand tamper for use around small DEWATS projects. Use a mechanical tamper (Wacker) for larger projects.

Background

Following are the key issues to keep in mind when planning and carrying out excavation activities:

Basic excavation safety. Train workers to be mindful of the excavation equipment. Backhoe operators have a limited view and may not see you if you are too close to the boom or in a blind spot.

Shoring: excavations greater than 1.3 meters in depth require shoring or sloped sidewalls if workers will be performing tasks in the hole. Depending upon the structure of the soils and depth of the hole, shoring may be complicated requiring structural engineers to design the shoring system.

Protecting workers in the excavation. Even after the shoring has been installed, protect the workers by monitoring their activities from the ground surface, and keep equipment and other workers away from excavation. Workers in the excavated hole must wear hard hats. CAUTION: deep excavations may be confined spaces by definition. Workers in the hole should have a safety harness and at least one worker on the surface who can pull them out in case of trouble.

Soil Bearing Capacity. Excavations that will house footers for large tanks require bearing capacity tests to verify the soil structure will hold the weight of the tank when full. Sometimes, on soft soil sites, differential settling occurs which causes the tank to visibly tilt, which may drastically compromise the effectiveness of the system. Soils laboratories can perform bearing capacity tests for minimal fees.

Backfill and Compaction. Sewer lines and tank holes must be back-filled with appropriate material, and compacted to 95% of what is called the Maximum Modified Procter (MMP). It is a simple test that can be conducted in the field. Care must be taken not to over-compact, or damage to the sewer line or tank may occur. Not enough compaction and settling or erosion may occur. TIP: backfill over tanks and sewer lines should be graded to drain so ponds or pools of standing water do not form. For the fill material, use crushed gravel (AB) or soil that is free of debris, stones or rocks that may damage the tank or sewer line. Adding a little moisture can help achieve compaction. Compact soil in lifts of 6" to achieve best results.

Test the soils first. Excavating soil discovery holes (test holes) can identify shallow bedrock or groundwater, which can dramatically complicate excavation. Knowing about these conditions helps identify the proper equipment to carry out the job, and how much time and money the excavation will take. TIP: Dig one test hole for tanks, two for leach trenches, or more if you suspect that the soils are variable.