Dissecting tank species

This month's column is an excerpt from Nate Downey's coming book, *Harvest the Rain*.

Cisterns can be divided into two species: seen and unseen, *cisternus visbilus* and *cisternus invisibilus*, respectively. The visible species stand on level ground or are partially buried in the ground. Invisible tanks are buried below grade.

The *visibilus* are almost always less expensive than their subterranean cousins. Although the material costs for abovegrade tanks are typically less than those of underground ones, the labor cost associated with hiding even an eight-foot-diameter water storage tank below the surface of the earth are considerable.

It is common for a 2,000-gallon underground tank to need a hole that's 10 feet wide x 10 feet long x 12 feet deep. This kind of excavation job requires a backhoe and often a dump truck for moving or removing excess earth. Anyone wanting to pick and shovel such a maw and wheelbarrow that much earth by hand would need a *Shawshank Redemption* level of patience, or as we used to say on the crew that kind of project would take, "a month of Sundays."

In addition, with respect to *cisternus invisibilus,* conveyance piping is typically longer and more labor-intensive than the shorter, unburied veins of *cisternus visibilus.* In many cases downward diversion pipes can be very short when the top of a tank is so close to the roof pouring into it. Add the cost of below-grade lateral lines that have to run out to an underground tank, and watch your installation costs rise.

The dirt removal associated with unseen cisterns is the most surprising cost for many people, especially in smaller property situations where there is simply no room onsite for extra earth. Since much of the dirt removed from a 10 x 10 x 12 hole is not going back in due to the significant volume of the cistern itself, the remaining dirt must be dealt with in an appropriate way. The least expensive method is to ask every building contractor in the phone book until you find one that needs fill dirt, and then tell them that you have some that's free for the taking.

As far as predicting the amount of dirt that you will have left over from such a project, make sure you factor-in something called the swell factor. Whenever you dig a hole, the dirt you excavate increases in volume by about one-third due to the air that the excavated earth absorbs as it is removed from its naturally compacted abode. *Please note that this can be a huge unforeseen problem for invisible cistern installation projects.*

Even though all of this kind of work costs significant money, the benefits of having an unseen cistern are equally considerable. First, if you happen to have a big, black, industrial-looking water-storage tank hanging out with you day in and day out just off the front porch, as is the case with *cisternus visibilus,* from a curb-appeal perspective it can be a little harder to sell your house. Unless water issues in your area are already very serious, if you have the money or can get a fair loan, a tank of the underground variety may be worth the investment — especially if the honking thing would be difficult to screen with fencing or plants.

A second benefit of unseen cisterns is that they provide more useable real estate. In close quarters, this is important, while on larger properties, it can be less of an issue. This benefit, however, is lessened in cases where privacy screening or a much needed windbreak can be created with an appropriately placed aboveground tank.

Thirdly, in order to prevent freezing, *cisternus invisibilus* is especially preferable to *cisternus visibilus* in cold climates. Pumps, pipes and the narrow-diameter fittings on the distribution side of the tank-wall are particularly susceptible to frost-damage. So, if maintenance costs are figured in, poorly designed aboveground cisterns can actually cost more money and/or more hassle than underground systems.

Nate Downey (424-4444, www.santafepermaculture.com) is president of Santa Fe Permaculture, a locally owned landscape-design firm. His first book, Harvest the Rain, is scheduled to be published this year by Sunstone Press.