

Grave Marker Leveling Guidelines

Who Should Relevel: Leveling grave markers is the second easiest activity for volunteers to do after cleaning. That said, an experienced leveler should be on-site to train the volunteers and to be present for the odd situation. Volunteers should not be used on large monuments (i.e., those over 600 pounds).

When hiring to do releveling work in a cemetery, be sure you hire qualified professionals. If they do not have a tripod that can handle 1000 pounds, they probably should not be hired. The Oregon Commission on Historic Cemeteries has a good bulletin on what to consider when [hiring a contractor](#). For a current list of contractors doing cemetery work, contact the [Oregon Commission on Historic Cemeteries](#). When calculating an estimated cost for releveling, figure about one person-hour per marker. Some will go quicker; larger ones will take longer.

Releveling: The rule of thumb is that a marker needs releveling when it has an angle of inclination greater than 10 degrees. Leaning markers are susceptible to vandalism and/or breakage. Since monuments are different shapes, the center of gravity of the monument determines if there is a real need for releveling. If the center of gravity is nearing its topple limit, then it needs to be relevelled. Often that limit is around 10 degrees, but may be less for tall, narrow monuments such as obelisks.

There are a variety of scenarios when releveling, but all start with probing around the perimeter of the base. There may be a ring of concrete that has been poured after the stone was installed in an earlier attempt at leveling. There might be a footstone (see picture to right) buried next to the headstone. Probing will give you the information you need for the next step.

The base should then be excavated on the side (or sides) to which the stone is leaning. The side (or sides) should be excavated down to the bottom of the base. Be extra careful to watch the center of gravity when releveling an obelisk as they can become tippy. Dig out a few inches on the other sides of the base to give the base room to relevel. Nothing is harder than prying against firm dirt.

Next, very carefully pry with a long bar. Some markers are too heavy to lever and will require a tripod to lift. A professional should be doing the work if a tripod is necessary. Once the marker is held at level, then push in and pack gravel (3/4" minus gravel works best) under the monument to support and distribute its weight. Check vertical with an inclinometer frequently. Using gravel works very well as it is an inexpensive and completely reversible leveling method. In cemetery work, nothing lasts forever, but the next relevel will be much easier if gravel is used rather than concrete.

Tripods can be useful in leveling heavy stones, particularly if they have toppled over. A tripod can be used to secure part of a monument that is detached from its base while the base is leveled. We rarely use a tripod to level tablet type stones because lifting straps around the base tend to push against the tablet itself and may cause damage.



Tripods: There are basically two types of tripod lifts to use in a cemetery: wood or metal. Tripods are best in historic cemeteries as they can be carried in and assembled in tight quarters. In modern lawn cemeteries, the layout of the cemetery is conducive both to lawnmowers and truck delivery of monuments. The tripod chosen is determined by the weight being lifted and the height needed. The aluminum tripod pictured here is OSHA-approved and rated to 2000 lbs. The wooden tripod below is home-built and self-rated to about 600 lbs. The aluminum tripod has extendable legs allowing it to pick up a ten-foot-tall monument. The wooden tripod will not pick up anything taller than four feet. The aluminum tripod costs about \$2500; the wooden tripod less than \$100.



When figuring out which tripod to use, remember that marble weighs about 160 pounds per cubic foot. Granite is about 170 pounds per cubic foot. Concrete weighs about 145 pounds per cubic foot. And sandstone is lightest of all at about 140 pounds per cubic foot. Monuments are always heavier than they look.

The two tripods will cover all situations except for very large monuments. Regardless of which tripod we use, we prefer a come-along for lifting. Many cemetery professionals use chain hoists. However, we do not like having the chain swinging around amongst fragile stone monuments. Therefore, we use a come-along with a 3000-pound capacity, as all the metal parts stay above the stone.



Hooked to the come-along are wide lifting straps, from 10 feet to 18 feet in length. Use lifting straps rather than towing straps, as towing straps have more stretch and you do not want stretch when pulling something out of the ground.

Wrap the monument once and then wrap the strap back on itself so that the stone is evenly supported from both sides when lifting. Wrap the monument just above the center of gravity. For tall monuments, wrap a small cord around the top of the straps to keep the top of the monument from tipping.



Always wrap the strap around the lowest piece you are lifting or you might just pop the headstone off of its plinth. The friction between the wide lifting strap and the stone keeps the strap from slipping. On a polished granite monument, care should be taken to get the strap partially under at least two of the corners or the strap might slip.

Resources: There are several makers of aluminum tripods but Wallace Cranes has the most variety and information on their product (<https://www.wallacecranes.com/products/tripod-cranes/adjustable-height-aluminum-tripod/>).

The wooden tripod pictured above is made from three eight-foot-long 2x4s. Be sure to get #1 select grade so that you have the tightest grain with the fewest knots. Drill a 3/4" diameter hole 1" from the end of all three boards. Tie the three boards together by slipping one 8"-long 1/2"-bolt through the hole with washers between all of the boards. Between two of the boards, hang two 1/2" quick links for the come-along. Secure with a 1/2" lock nut (nylon insert). Do not tighten the nut – leave the assemblage somewhat loose so you can form a tripod with the 2x4 legs.