Ground Screw Installation Manual

BDIGROUNDSCREWS.COM
3500 Tree Court Industrial Blvd. | St. Louis, MO 63122
636.255.5011

TABLE OF CONTENTS

OVERVIEW

BDI is the #1 American-made ground screw manufacturer in the industry. Our products are manufactured to the highest standards, ensuring that you can create strong and enduring structural foundations that are faster to construct (no digging or cure period), cleaner and less costly than concrete-based foundations. Installation can occur in a day in all soil conditions using a hydraulic, low speed/high torque driver that makes erecting a secure foundation a precise and straightforward process. This manual provides detailed guidance on how to successfully install your ground screw foundation.

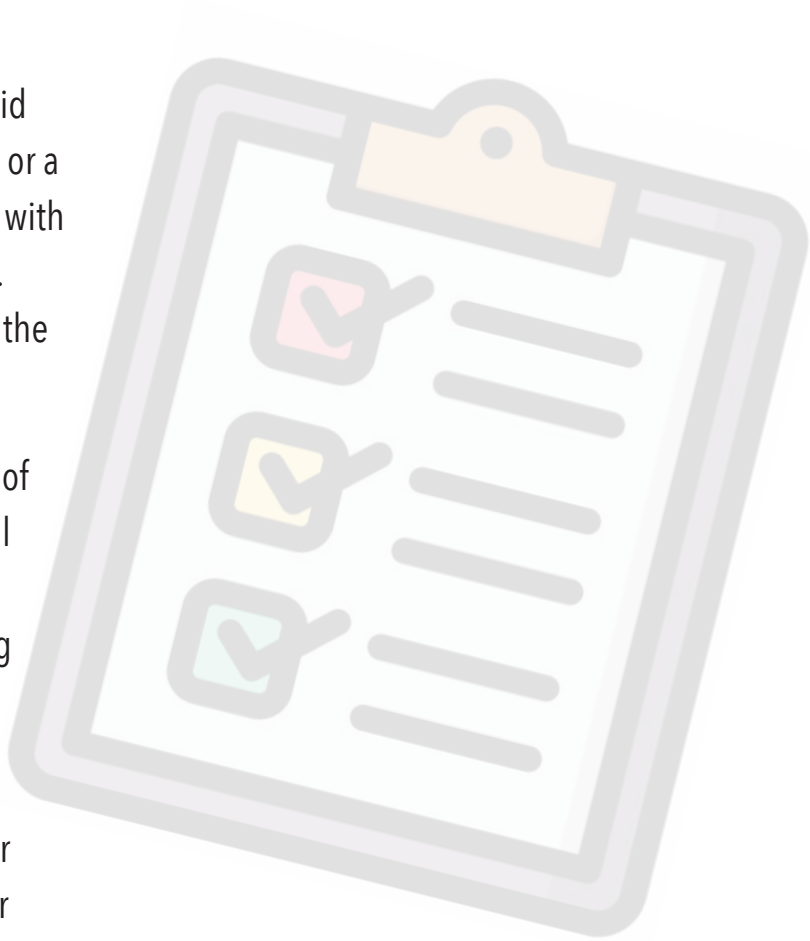
SCREW SELECTION

The selection of the proper ground screws for your structure requires consideration of two factors: 1) An understanding of your site's soil properties and frost line; and 2) Engineering input. We recommend seeking guidance from local installers or geotechnical advisers to determine the site's soil conditions. This knowledge should be shared with an engineer, who can select screws capable of handling the anticipated structure loads given the soil conditions. When selecting ground screws also consider these factors:

- Screws should be installed so that two-thirds of the ground screw thread (flight) is below the frost line
- Fixed caps, plates and/or inserts should be selected to support the loads required and facilitate the installation of the above ground structure.
- BDI recommends that 6 inches of the screw stick out above ground for screws longer than 4 feet in length.

EQUIPMENT LIST

A successful ground screw foundation installation is enabled by the upfront assembly of the proper equipment.



- **Screw Drill Machine:** We recommend a Skid Steer, either compact or full size, an Excavator or a Drill Mast. The machine will need to be fitted with the appropriate low speed-high torque driver. Always refer to the instructions provided with the screw drill machine you selected.
- **Torque Monitor:** BDI recommends the use of a torque monitor to measure torque rotational resistance (torque) applied to a screw during installation to verify that it meets load-bearing capacity requirements and engineering specifications.
- **Drive Bits:** Select drive bits that are fitted for your screw machine and compatible with your ground screws. BDI provides installation bits that are fitted to our screws for better performance. They do not void the product warranty.
- **Screws:** Your ground screws and inserts.
- **Levels:** Tube/pipe levels and laser levels, which ensure a plumb ground screw installation.
- **Ground Prep:** String lines and spray paint are needed for marking the screw locations. Pins and/or drill bits enable the drilling of pilot holes.
- **Safety Gear:** Secure and wear the necessary personal protective gear during the installation process.

SITE PREPARATION

There are number of critical steps to take to prepare the site for a successful installation:

- **Marking Underground Lines:** Contact your local utility company directly at 811 (at least 3 days before digging) to get underground obstructions identified and marked in the install area. If you have private lines (e.g. wiring to lampposts, septic tank pipes, hot tub electrical lines, et al) you should contact a local private utility-locating company since your public utility company will not mark private lines.

- **Prepare Area and Screws:** Lay out your screw pattern. Run string lines and/or use a laser level to determine screw install depths/heights and mark the tops of the ground screws accordingly. Also mark the screws lengthwise with insert depth intervals for use with the torque monitor. NOTE: BDI recommends a 6" stick out (above ground) for screws over 4'. If your grade varies beyond this amount, we have inserts for mounting that can accommodate a larger spread variation.

- **Pilot Holes:** Use driven pins or drilled pilot holes no larger than 1/3 the screw diameter to aid in final placement of each screw prior to installation. These holes only need to be driven to a depth suitable to start the tip of the screw.

- **Equipment Check:** Ensure all driver bits are in good working condition and that the torque monitor is calibrated and installed properly. We encourage you to take as much "play" out of your drill string as possible.

- **Screw Access Logistics:** Locate the ground screws in an area convenient to the installation area. Make sure this location doesn't interfere with access to each screw install location. Once you start installing screws the area gets crowded very quickly.

MACHINE INSTALLATION INSTRUCTIONS

For best installation results we recommend practicing driving and making adjustments to the screw before beginning the installation. A spotter/assistant must maintain visual contact with the machine operator at all times during installation. Observe these key tips:

- Refer to the operator's manual of your screw drive machine.
- Set the proper install torque. The recommended torque is 5,000 ft#lbs MAXIMUM.
- Ensure the drive bits used for the ground screws are sized properly to fit snugly on the screw. If the drive bit is loose, be wary of the screw getting mis-aligned while rotating.
- Ensure that the driver and bit are aligned, and are plumb when beginning to rotate/drive the screw. Attach a pipe/post level to the screw to provide a view of the straightness of the screw (plumb) when the install begins.

- Drive the ground screw clockwise. We recommend 10-20 RPMs max. You may stop rotating, but do NOT reverse drive the screw during installation.
- If the screw is not given constant downward pressure, the screw will "churn" or "auger" and will pull spoil out of the hole – acting like a drill instead of a screw, compromising compression.
- Make adjustments to "plumb" the screw early in the install cycle – while the screw flights are above grade.

REFUSAL / REMOVAL

Ground screw refusals (i.e. when the screw resists penetration during installation) are not uncommon, nor are they showstoppers. If the refusal is caused by a thin soil level or a rock, an impact tool can be used to clear the obstruction so the screw can be re-inserted. NOTE: when using the impact tool it is important to re-fill the hole with spoil or aggregate.

In some cases it may be necessary to drill and excavate a hole slightly larger than the screw outer diameter to clear the obstruction, then fill the hole with aggregate and re-inset the screw.

Ground screws can be removed by simply *reversing the screw*.
NOTE: Once the screw tip is within 14" of grade, it will no longer have thread engagement and can be lifted out of the hole.

INSTALLING SCREW INSERTS/SUPPORTS

BDI offers a variety of insert and support fasteners for supporting your structure that attach to our ground screw "nut cage". You will need three (3) nuts and bolts per ground screw. The cage over the hole in the screw can accept a 5/8" or M16 nut or smaller. We recommend a "pointed or coned end" bolt and tightening the bolt to 60 foot pounds with a torque wrench.

FOR MORE INFORMATION ON INSTALLING YOUR BDI GROUNDSCREWS GO TO:

https://bdigroundscrew.com/contact/

AND SEND US YOUR QUESTION OR REQUEST.