



Ditch Witch® Equipment Solutions

HDD Gravity Sewer Installations



With OnGrade, You're On The Right Track.

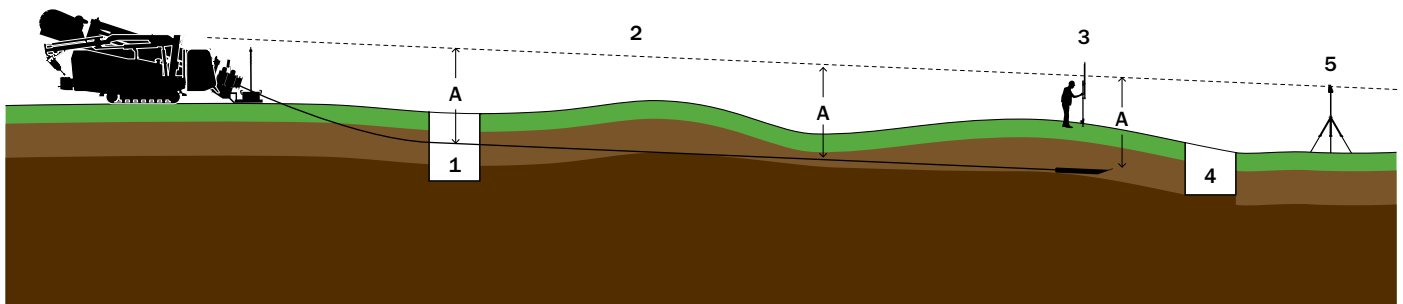
Ditch Witch® OnGrade™ is the most advanced, most accurate system for installing new gravity-flow sewer systems using horizontal directional drilling.

The patented OnGrade system utilizes laser technology, advanced Ditch Witch electronics, and the industry's most innovative downhole tools to help you drill accurate grade bores with unbeatable efficiency.

The advantage of the OnGrade method over other grade-drilling methods is a laser-guided reference point from the entry to the exit pits. From this fixed reference all depth measurements are taken—no need for pre-survey of reference points, recalculation of depths at points along the bore path, or sight relief holes for depth verification.

With the OnGrade system properly set up, it's a matter of the drill operator maintaining a constant distance between the drill string and the laser line, and making steering corrections as necessary all the way to the exit pit.

Overview Of The OnGrade Process



The following is a general overview to describe the OnGrade method. Complete step-by-step instructions can be found in the OnGrade operator's manual.

After determining the start (1) and end (4) pits, the drilling unit and grade laser (5) are positioned as shown. The laser plane (2) is set to the desired grade.

With the help of a Ditch Witch 8500TK tracker, the drilling unit drills into the start pit, typically a manhole. Once the drill head enters the start pit, a visual depth reading is taken from ground level to the top of the beacon housing. Another visual depth reading will be taken at the end of the bore, for comparison.

The 8500TK tracker is then mounted on the laser grade pole (3). The drill operator bores into the far side of the start pit, and the tracker takes an initial reading. If the distance from the laser plane to the center of the beacon (A) is maintained for the duration of the bore, then the bore will be completed on grade.

With reliable information provided by the OnGrade system and sent to the operator display, the drill operator knows precisely how much to correct each time a reading is taken in order to maintain this target distance.

The advanced, user-friendly 8500TK tracker/850BG beacon system is important to the success of the OnGrade system. The fixed-length calibration feature of the 850BG beacon ensures precise depth calibration, and the 8500TK can read and display percent of grade in tenths-of-a-percent increments.

OnGrade Components | All components of the OnGrade system (except downhole tooling) fit in a sturdy job box.



Grade Pole

- Pre-survey and reference points not required
- Couples with the 8500TK tracker for continuous grade reference during the bore
- Simple depth/grade target for driller
- Can cover 13 ft (4 m) of elevation change with extensions
- Includes protective carrying case



8500TK Tracker/Display and 850BG Beacon

- 60 roll positions
- Offset locating capability
- Drill-through functionality with left/right guidance
- 0.1% pitch resolution
- Functions with the laser grade pole
- Includes protective carrying case



AS2 Grade Laser (optional)

- Class II laser
- Requires line-of-sight between laser plane and grade pole apparatus, either of which can be offset from the desired bore path
- Multiple adjustment tripod (crank center height and adjustable legs)
- Includes protective carrying case



Job Box (optional)

- For protection and transport of all OnGrade components except downhole tooling



Calibration Fixture

- Provides precise, repeatable depth/grade electronics calibration prior to bore
- Collapsible for easy transport and storage
- Digital Smart Level for precise pitch reading during grade calibration



Grade Inspection Trolley and Camera

- Pulled through service pipe after installation for grade verification
- Utilizes existing beacon
- Camera with digital recorder for video inspection
- 500 ft (152 m) power cable



Grade Drill Housing

- End-load housing for consistent signal strength in all roll positions
- Thread-head system for pocket-bit or flat-bit heads
- Beacon clocked from back of bit head (no shims)
- Grade tailpiece holds rear of housing centered in the bore



Grade Reamer (optional)

- Three-wing cutting structure
- Mixing paddles make contact with bore sides to improve stability



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