

GeoTesting Express, Inc., (GTX) provides the fastest turnaround time available for mechanical and physical properties testing services on soils, rocks, and geosynthetics.

GTX can help prevent structural problems on every kind of construction project – from tunnels, bridges, and offshore oil rigs, to skyscrapers and landfills – by carefully testing what’s used beneath the surface. We offer worldwide service and maintain a license with the United States Department of Agriculture, so we can accept samples, regardless of where they originate.

### Drillability Test Suite

Drillability testing aids in choosing methods and equipment to be used for tunneling and rock blasting projects. Tests included in the drillability test suite are the Brittleness Value ( $S_{20}$ ), Sievers’ J-Value (SJ), Abrasion Value (AV) and Abrasion Value Cutter Steel (AVS).

Drillability testing determines the Drilling Rate Index, Bit Wear Index, and Cutter Life Index. These indices help characterize rock by determining its brittleness, surface hardness, and wear capacity.

Drillability results enable predicting project advance rates and costs.

#### Brittleness Test Apparatus

An impact apparatus is used to determine the Brittleness Value ( $S_{20}$ ).

#### Siever’s Miniature Drill Apparatus

The surface hardness is determined using the Sievers’ J-Value determined with a miniature drill apparatus.

#### Abrasion Testing Apparatus

The wear capacity is determined using an abrasion testing apparatus where tungsten carbide and cutter steel test pieces are abraded by rock powder. Abrasion values are determined for each type of test piece.

The Drilling Rate Index, is calculated using the Brittleness Value ( $S_{20}$ ). The Bit Wear Index, is calculated using the Drilling Rate Index and the wear capacity of the tungsten carbide test piece. The Cutter Life Index, is calculated using the Sievers’ J-Value and the wear capacity of the cutter steel test piece.

Reference: GTX’s drillability testing suite is based on NTNU’s 13A-98 DRILLABILITY Test Methods, Dept. of Civil and Transport Engineering & SINTEF’s DRI, BWI, CLI Standards, January 2003.

The trademarked acronyms and terms DRI™, BWI™, SAT™, Drilling Rate Index™, Bit Wear Index™, Cutter Life Index™, and Soil Abrasion Test™ are unique for test results and calculated indices originating from NTNU/SINTEF and can only be obtained by testing samples at their reference Laboratory in Trondheim, Norway.

#### For More Information Contact:

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# Tunnels

## Characterization and Testing

### Rock Testing

- Air permeability
- Cerchar abrasivity ♦
- Direct ♦ and indirect ♦ - (Brazilian) tensile
- Direct shear/sliding friction ♦
- Drillability Test Suite
- Elastic moduli ♦
- Freeze/thaw
- Hardness ♦
- Hydraulic conductivity
- Petrographic analysis
- Point load index ♦
- Pulse velocities and ultrasonic constants ♦
- Punch penetration ♦
- Slake durability ♦
- Triaxial ♦
- Unconfined compression ♦
- Wet/dry

### Soil Testing

- Consolidation (incremental ♦, constant rate of strain ♦,  $K_0$ )
- Cyclic simple shear
- Direct ♦ and residual shear
- Direct simple shear ♦
- Index ♦
- Permeability ♦
- Resilient modulus ♦
- Resonant column ♦ / Torsional Shear
- Triaxial (UU ♦, CU ♦, CD ♦, cyclic, extension)

♦ Tests for which GeoTesting Express is accredited by A2LA

### Tunnel Project Experience

West Roxbury Tunnel, MA; Hatch Mott MacDonald; 2010	XTO Pedestrian Tunnel, Fort Worth, TX; Fugro Consultants; 2008
THE Tunnel, NY/NJ; THE Partnership; 2005-2010	Governor's Island Water Main, NY; CDM; 2011
Port of Miami Tunnel, FL; Universal Engineering; 2010	MBTA Green Line Extension (GLX), Boston, MA; Nobis Engineering, Inc.; 2013-2014
Deep Tunnel Design; Hillis-Carnes Engineering Associates; 2010	The Third Catskill and Delaware Aqueduct, NY Hatch Mott MacDonald/Malcolm Pirnie J.V.; 2011-2013
Metropolitan District of Hartford Deep Rock Tunnel, CT; CDM; 2009	North Dorchester Bay CSO Storage Tunnel, MA; Barletta Heavy Division; 2008
DeKalb County Interplant Tunnel Phase II, GA; MC Squared, Inc.; 2009	Harbor Siphon Replacement; Mueser Rutledge Consulting Engineers; 2011
Omaha CSO Tunnel, NE; HWS Consulting; 2008	Indianapolis Deep Rock Tunnel, IN; AECOM; 2009
NEIS-GBIS Sewer Tunnel, Los Angeles, CA; MACTEC Engineering & Consulting; 2008-2009	North Dorchester Bay CSO Tunnel, MA; Shank/Balfour Beatty; 2008
Baltimore Red Line Cooks Lane and Downtown Tunnels, MD; Parsons Brinckerhoff; 2013-2015	NEIS-GBIS Sewer Tunnel, NEIS2 and NEIS2A, Los Angeles, CA; AMEC and AECOM/URS; 2008-2013
RWBTT Phase 2 Geotechnical Investigation Program, NY; Jacobs Associates; 2014	South Hartford Conveyance and Storage Tunnel, CT; AECOM; 2013-2014

Accredited by:

