

## What is a Rotational Penetrometer?

The Rotational Penetrometer (RP) is a precision tool for measuring the firmness and stability of ground and floor surfaces.

### How does it work?

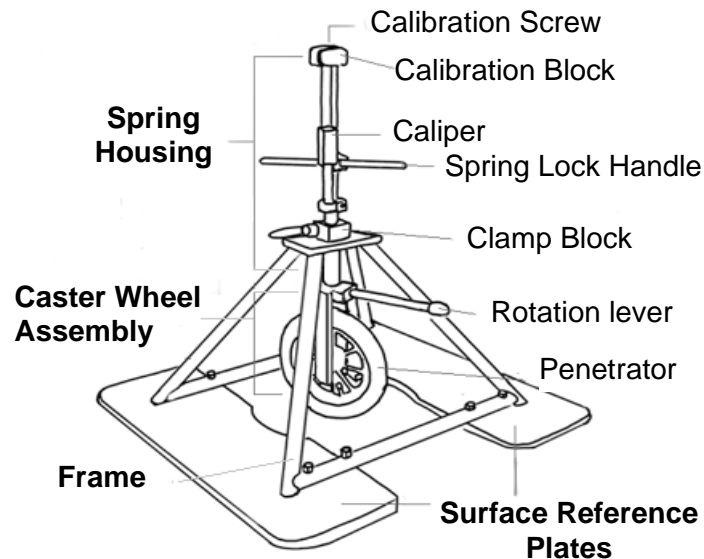
To measure firmness, the precision spring applies force to the penetrator, and the caliper measures the amount of vertical displacement of the penetrator into the surface. The penetrator is then rotated, and the total displacement into the surface is measured, which indicates stability.

### What kinds of surfaces can it measure?

It is capable of measuring all types of indoor and outdoor surfaces, from carpet to wood chips to sand. The RP is useful for measuring firmness and stability on trails, playgrounds, and other public surfaces.

### How big is it?

The base measures 24 x 24 inches, and the fully assembled RP stands 28¾ inches high. Fully assembled, the entire unit weighs 12 pounds.



**Penetrator Assembly** = Spring Housing + Caster Wheel Assembly

## Rotational Penetrometer

## Beneficial Designs

Works towards universal access through research, design, and education. We believe all individuals should have access to the physical, intellectual, and spiritual aspects of life. We seek to enhance the quality of life for people of all abilities, and work to achieve this aim by developing and marketing technology for daily living, vocational, and leisure activities.

Development of this device was funded by the National Center for Medical Rehabilitation Research in the National Institute of Child Health and Human Development at the National Institutes of Health through Small Business Innovation Research Phase I Grant #1 R43 HD30979-01 and Phase II Grant #2 R44 HD30979-02.

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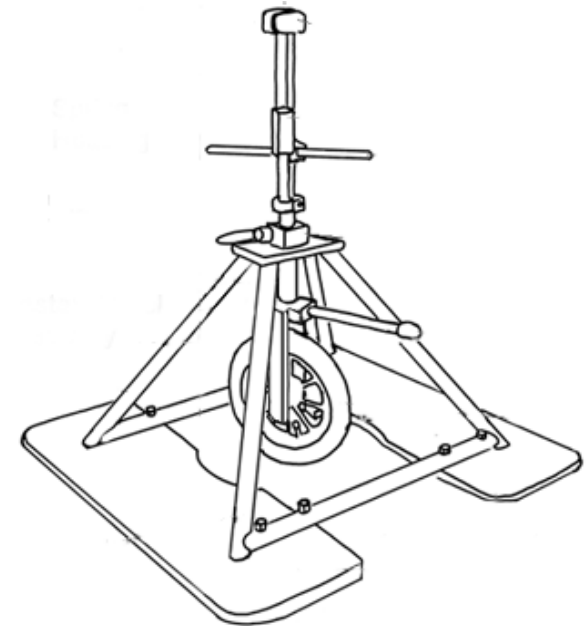
For information about surface accessibility:  
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For information about trail access, UTAP,  
TrailWare, and TrailExplorer:

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# Rotational Penetrometer

**A portable tool for measuring the firmness and stability of ground and floor surfaces**



**Beneficial Designs, Inc.**  
Minden, Nevada USA

## Rotational Penetrometer

### Why measure firmness and stability?

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) specify that accessible routes must have ground and floor surfaces that are firm and stable. Surfaces that are not firm and stable limit accessibility for wheelchair, cane, crutch, and walker users, parents with strollers, and other individuals with mobility limitations.

### Why do we need objective surface measurements?

Objective surface measurements will provide builders, architects and site planners with methods and standards by which they can create accessible indoor and outdoor surfaces. These measurements will determine the relative degree of accessibility of various surfaces, and provide individuals with access information at specific locations.

### Who can operate it?

To use the RP independently, the operator must be able to stand over the 29" device, bend at the waist, and have the strength to release a 44 lb spring. The RP does not require engineering expertise.

### How durable is it?

The RP is designed for outdoor use, and its durability reflects that. Constructed of stainless steel and aluminum, with surface reference plates of finished plywood, the RP holds up for long-term use.

### Can it be linked to a computer?

Yes. A laptop computer using the RS 232 Optical Interface Cable Assembly and RP Data Collector software can record measurements from the caliper.

### Does the device produce accurate and reliable measurements?

The RP's effectiveness has been proven through research. An interlaboratory study was conducted according to ASTM E691, and the penetrometer was shown to produce repeatable and reproducible measures. These measurements have been shown to correlate with the amount of work required to propel a wheelchair (as measured by ASTM F1951) and the amount of physiological energy required by persons with and without disabilities attempting to negotiate a surface. For copies of the background research, please contact us.

### Is assembly required?

The RP consists of the Spring Housing and the Caster Wheel Assembly (which can be separated by a quick-release pin) and the frame. The RP is easily assembled without tools, and can be disassembled for storage.

### Universal Trail Assessment Process (UTAP) & TrailWare

The RP can be used with the UTAP, and TrailWare can be used to process measurements taken during a trail assessment. For more information about UTAP and TrailWare, please call or contact us at <trails@beneficialdesigns.com>.

### The Rotational Penetrometer Kit includes:

- ◇ Rotational Penetrometer
- ◇ User's manual
- ◇ Instructional video
- ◇ Data recording forms
- ◇ Clipboard
- ◇ Air pump with calibrated air gauge
- ◇ Specimen containers
- ◇ Temperature/humidity sensor
- ◇ Spare tube for caster
- ◇ Spare caliper battery
- ◇ Case for carrying and storing the precision measurement components
- ◇ Checklist

### Computer Interface Accessories

- ◇ RS 232 Optical Interface Cable Assembly allows the caliper readings to be recorded by a computer
- ◇ RP Data Collector software is a user-friendly program for collecting data using a computer

### How much does it cost?

The RP kit costs \$2,595.00 plus shipping. The RS 232 Optical Interface Cable Assembly and RP Data Collector Software is an additional \$295.00.

### Warranty

The RP has a 90-day parts and labor warranty. It is delivered in a calibrated state, ready-to-use. The RP and pump gauge calibration is valid for two years. Cleaning and recalibration of the RP and pump gauge is a service available at our testing laboratory.

## Rotational Penetrometer ORDER FORM

Date \_\_\_\_\_

- Yes, I would like to purchase a **Rotational Penetrometer** kit for **\$2,595.00** plus shipping
- Please add the folding base option **\$185**
- RS 232 Optical Interface Cable Assembly** and **RP Data Collector** software for **\$295.00**

**SHIP** via UPS:  Ground  2nd Day Air  
**Sales tax** will be added to orders in CA, NV, TN.  
All prices valid until 12/31/10.

### ORDERED BY

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Ph \_\_\_\_\_ Fax \_\_\_\_\_

### SHIP TO

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Ph \_\_\_\_\_ Fax \_\_\_\_\_

### PAYMENT METHOD

VISA  MasterCard  Purchase Order

Card/PO number \_\_\_\_\_

Expiration date \_\_\_\_\_

Name on card \_\_\_\_\_

Signature \_\_\_\_\_

Email \_\_\_\_\_

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