

# How strong is your pavement? We can tell you.

Falling Weight Deflectometer (FWD) Testing & Analysis  
Infrastructure Management & Pavement Engineering



# What is FWD?

The FWD is a non-destructive test method to assesses pavement strength. The test simulates loading from a truck or aircraft tire.

A heavy load is dropped onto the pavement surface and the surface deflection is measured.

Stantec owns both Falling Weight Deflectometers (FWD) and a Heavy Weight Deflectometer (HWD). The HWD applies higher loads than the FWD.

The deflection measurements provide valuable information related to pavement and subgrade strength.

Through a process known as Backcalculation, the following characteristics in the table can be determined.

Determine	Rigid	Flexible	Unbound
Load Carrying Capacity	●	●	●
Remaining Service Life	●	●	●
Deflection	●	●	●
Voids Analysis	●		
Subgrade Soil Resilient Modulus	●	●	●
Load Transfer Efficiency	●		
Effective Structural Number	●	●	●
Effective Pavement Modulus of Elasticity		●	
Effective Slab Thickness	●		
Concrete Modulus	●		
Modulus of Subgrade Reaction	●		

## How it works

The FWD unit comes to a full stop (traffic control may be required) and drops a plate onto the testing surface which simulates the loading of a moving truck or aircraft wheel. The response or deflection of the surface is measured by seismic sensors (geophones). The loading sequence consists of a seating drop followed by load(s) application at various target heights.

Our FWD's are equipped with software to automatically measure and record surface and air temperatures. Distance is measured from a reference point using a distance measurement instrument (DMI), and differential GPS provides the test point coordinates.

The data collected from the FWD is then run through software with the associated layer thicknesses collected from GPR or as-builts. The software normalizes the maximum deflection to 40 kN (9,000 lbf) and the temperature to 20°C (68°F).



# Applications

Roads (Local, Highway, Haul)

Airport Runways

Parking Lots

Ports

All Pavement Types (Unbound, Flexible, Rigid, Composite)



# Benefits

 Non-destructive testing

 Cost-effective

 Quick

 Determine the remaining service life

 Accurate and consistent strength data

 Safe

 Simulate varying levels of loading

 Obtain strength or condition of pavement material

## Design with community in mind

We're active members of the communities we serve. That's why at Stantec, we always *design with community in mind*.

We collaborate across disciplines and industries to bring buildings, energy and resource, and infrastructure projects to life. Our work—professional consulting in planning, engineering, architecture, interior design, landscape architecture, surveying, environmental sciences, project management, and project economics—begins at the intersection of **community**, **creativity**, and **client relationships**.

Since 1954, our local strength, knowledge, and relationships, coupled with our world-class expertise, have allowed us to go anywhere to meet our clients' needs in more creative and personalized ways. With a long-term commitment to the people and places we serve, Stantec has the unique ability to connect to projects on a personal level and **advance the quality of life in communities** across the globe. Stantec trades on the TSX and the NYSE under the symbol STN.

