

# Cut out the guesswork

Australian Company leads in Bridge NDT



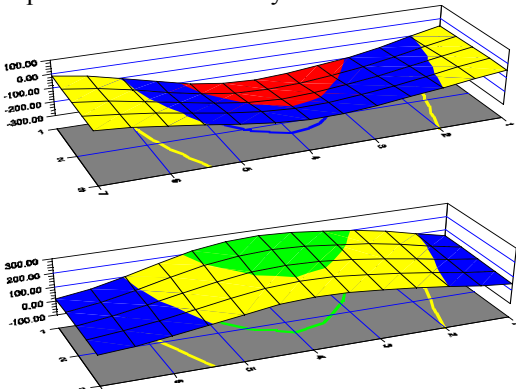
Turn of the century concrete bridge

Traditional methods of bridge assessment, either by visual inspection or desk top study using an estimate of the strength of the various elements in a bridge followed by detailed calculations to arrive at a capacity, often result in conservative estimates of bridge load limits. With unlimited funds this would not be a problem but with today's commercial pressures limiting funds for repair or replacement and fuel costs making long detours prohibitive a better method of assessment is needed. Studies have shown that 70% of bridge failures are due to foundations and bridge deck failures account for a further 15% consequently an effective test method has to account for both elements of the structure.



Bridge under test using small truck

Already well known for their work in testing piles and foundations Integrity Testing Pty Ltd was asked in the mid 80s to develop a fast and accurate method to measure capacity of a series of railway bridges in Asia and this work culminated in the mid 90s in the DBTS dynamic bridge testing system which coupled with existing pile test capacity enabled complete bridge capacities to be accurately measured.



Actual deflection of the deck as measured Slight weakness seen on the far side.

Since that time the system has been successfully used to test timber, concrete steel and composite bridges in structures ranging from 5 to 190M in length.

The DBTS dynamic bridge testing systems, and other similar systems in general, measure the structural capacity of the bridge deck by measuring its frequency of vibration under "in service" excitation.

Provided the structure will bend or deflect under load then its capacity can be determined. This equally applies to trusses, in fact it is a valuable tool to identify weak connections or suspect rivets in steel trusses. Another major advantage is that by animation the method of resistance of the deck to load can be seen i.e. is it shear at the supports or is it in bending?

This approach offers significant advantages over dead load testing in that frequency can be measured more accurately than deflection and the equipment is significantly more portable, faster and easier to use making it cost effective and minimising disruption to traffic flow.

How does your bridge assets fair? Well data from over 1000 spans measured by Integrity Testing show a variation in construction types and current capacity. The table gives the % number of spans and types which were measured as to be capable of being used by the given vehicles.

Type of bridge	T-44	B-Double	Rigid Axle
Concrete	70%	60%	90%
Steel (truss etc)	65%	45%	80%
All Timber	45%	35%	75%
Timber/steel girder	80%	65%	95%

There is a lot of life left in the existing infrastructure

In the final analysis knowing that a bridge is under the required capacity is only going halfway. It is the capacity of dynamic deck testing coupled with state of the art pile and beam testing to suggest simple cost effective repair/strengthening strategies that really provides the value.