# LOADTEST
# O-Cell® Technology on the Sandy River Bridge

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| Project | **Sandy River Bridge** |
| Location | Troutdale, OR |
| Client | Malcolm Drilling |

Project Description

The Oregon Department of Transportation adopted a plan to replace the aging Interstate 84 bridges over the Sandy River with two new steel box girder bridges. Challenging design conditions, including seismic, environmental and flooding concerns, created the need for smaller and fewer piles. Loadtest assisted in verifying drilled shaft capacity and determining the effect of post grouting the shaft tips

*Three 6000 kip O-cells Assembled with Plates*

Each test assembly consisted of three 6,000 kip O-cells on a single level. Test Shaft 1 was not tip grouted and Test Shaft 2 was. Malcolm Drilling excavated the shafts and performed the tip grouting. Both shafts were tipped in similar materials (dense sand) at similar depths. The shafts were tipped in the Troutdale Formation according to the Engineer. Foundation Engineering and ODOT observed construction and testing. The shafts were constructed and tested on a work trestle. Malcolm used a 2500mm rotator casing to tip and a 2500mm grab to excavate and clean the shaft bottom. For the post grouted shaft, the grouting occurred a few days after concreting.


*Malcolm's 2500-mm Grab*

The results of the O-cell test Served to confirm the engineering design. Although some project specialists were hoping for higher loads at given displacements, the results were similar to what was expected. Additionally, the test shafts were used as production shafts, saving the owner money since there were only eight shafts on the project's main span.


*Temporary Bridge Constructed by Hamilton*

Because the second test shaft was post grouted, the tests represent one of only two full scale large capacity O-cell test programs worldwide that compared grouted and ungrouted shafts in similar materials and depths on a small project footprint. The tests showed substantially improved stiffness response (service limit state) but only a small improvement to the ultimate (limit state).

Loadtest's strength, which is to provide definitive full scale load movement, and unit shear and end bearing data on very highly loaded deep foundation elements, proved invaluable for this project.


*Bob Simpson and Jon Sinnreich Running the Load Test*


*Looking at a Railroad Bridge From the Temporary Work Bridge.*