

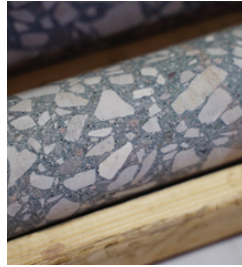
WHAT IS IT ?

Our What is it? series answers questions about some of the lesser known objects found on the construction site.

AT THE CORE - GEOTECHNICAL INVESTIGATIONS

What is it? A core sample.

What is a core sample? A core sample is a cylindrical piece of underground material that is extracted from the ground with a drilling rig. Most core samples are obtained by drilling with a hollow steel tube called a core drill. The hole made for the core sample is called the "core hole".



Close up of the core sample

Why are core samples taken? Core samples are used for geotechnical investigations to see the design characteristics of the rock and soil. The core samples undergo strength tests performed in a laboratory to reveal the characteristics of the soil and bedrock that is collected. The findings assist engineers in understanding the design loads that the rock layer can carry.

What different techniques are used to analyze core samples? There are three techniques to analyze core samples – conventional core analysis, whole core analysis, and sidewall core analysis. The conventional core analysis procedure is the most frequently used and involves choosing different intervals to represent the whole sample. These samples are usually collected once per foot or 3-4 times per metre. Whole core analysis examines the maximum possible sample size or as the name suggests, the whole core sample. Large samples are mandatory when there is thought to be fractures in the bedrock layer. Finally, sidewall core analysis is often used to obtain core samples from a particular zone that has already been drilled.



A drilling rig set up to extract a core sample

What is the process of taking a core sample?

A geotechnical engineer oversees a drill rig that drills down to the required elevation to extract the core sample. The core diameter is specified, and the core extraction is performed under specific guidelines so that the strength tests performed in a laboratory can all be sanctioned in accordance within a specified design criterion. The samples from the Gordie Howe International Bridge construction site were taken from depths of up to 45m/100 feet.

Do the samples need to be preserved?

In some situations there is fluid present in the core samples. If this fluid is to be analyzed it needs to be preserved before it gets to the lab to prevent evaporation of the fluid. Freezing the samples with dry ice is proven to allow these samples to be stored for a long period of time without their fluid content or other properties being affected.

Why are core samples important for the Gordie Howe International Bridge project?

Millions of years of geographical activity have shaped the ground on which the various components of the Gordie Howe International Bridge project sit. To ensure a solid base on which to build the bridge towers, ramps, and the many buildings at the Ports of Entry, geotechnical investigations are conducted.



Core samples taken from the Canadian bridge tower site