A deep five-level underground concrete foundation to support a 45-storey condo that is currently being built in downtown Toronto is using an innovative method to relieve shear pressure. That is, rather than employing the traditional 'rebar stirrup' method to strength the foundation walls against shear forces, which is very labour intensive and time consuming, stud rails are being used. By comparison, it is argued that stud rails are able to accomplish the same objectives as stirrups without excessive and time-consuming labour.

"What is great about it is that the rails can be installed in the wall after the outside face of reinforcing, followed by inside face of reinforcing, and then the concrete pour," states Kumbo Mwanang'onze, a structural engineer with RJC Engineers and consulting engineer for the condo development.

When talking about stud rails we are referring to a thin plate late of steel that is typically 600 to 1200 millimetres long. These studs are welded on centre to the rail at specific lengths and pre-assembled in a steel fabrication shop.

The Monde, which is the 45-storey condo by Tucker HiRise Construction, will be supplied its stud rails, which will be used to relief 5 storeys of water pushing against the underground foundation, by Peikko Canada.

Using this method will greatly speed up the project as each stud rail always has 10 studs that are placed on the go. Comparatively, 10 separate stirrups would be required to be installed for the same length as the pre-assembled stud-rail.

Though the material cost of stud rails are slightly more than stirrups, the labour efficiency that the stirrups offer is opening to door to more and more structural possibilities for underground and deep waterfront foundations.

Source: Stud rails relieve pressure on concrete foundation walls