

Project Title: Toilet of the future

Hennessy and Hinchcliffe Inc. (H&H Inc.) has developed the world's first siphonic single-flush 3.0 litre toilet, marketed in Canada as the "Proficiency". By creating a unique and innovative pressurized trapway through their BSB Flushing System, H&H Inc. has revolutionized the way a toilet flushes, significantly decreasing the amount of water used with each flush. Before the Proficiency was introduced to the Canadian market, the lowest flush volume available was 4.8 litres for a single flush.

The performance of any toilet and specifically the Proficiency is dependent on the design of the trapway (the curved channel that connects the pan of the bowl to the floor drain). In order to create an effective flush, this channel must be filled with water to generate a siphon and draw the waste from the bowl. The BSB system aids in speeding up the siphonic process through its patented air-transfer system, but improvements to the trapway can still be made and will result in maximizing the overall flush performance.

The task of the team will be to study and benchmark the current trapway design and the mechanical properties of the Proficiency toilet to identify areas where improvements in flush performance could be achieved.

H&H would like to explore the use of manufacturing trapways from alternative materials beyond the traditional ceramics. While working on improved trapway designs, research will be required by the team to study existing alternate materials (plastics and resins) that could be used in manufacturing the capstone designed trapway. Alternate materials must be comparable to ceramics in terms of strength, density, porosity, weight, wall thickness, and overall manufacturing costs. The alternate material must also adhere to code standards for plumbing fixtures and be able to attach to ceramics while the material is being tested in the field. If no suitable alternate material is readily available the students can assist H&H with sourcing manufacturers to develop a completely new alternate material that will suffice.

Finally the knowledge gained from studying our technology as well as alternative materials for trapways can be applied to designing a complete composite toilet. The capstone team can assist with creating a new world toilet that meets our vision for the toilet of the future which is: something that can be purchased online, is easy to install and able to withstand the rigors of commercial shipping. We would like to be able to manufacture this advanced technology in Ontario, Canada and have interested student team members as project leaders after graduation.

Project Deliverables:

The choice of the correct material and testing of same for strength, durability, weight etc to meet industry standards. It would be a goal to have all or most of the parts recyclable.

A design that will use the basics of our water saving technology, make for easy installation and will be aesthetically acceptable to the general public.