

# Design Tool

## Automated Design Tool

We don't design each plant from scratch. Instead, we do research to understand the fundamental processes of water treatment and invent scalable, reproducible tools that can be combined to form a complete water treatment plant. Then, our Automated Design Tool does exactly that. The ADT is free software that allows users to receive customized AutoCAD plant designs based on inputs like flow rate and region of the world.

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## Accessing the Automated Design Tool

The AguaClara Automated Design Tool (ADT) is the key to AguaClara's continuing scalability. The designs generated by the design tool, in conjunction with professional engineering review, enable the construction of new plants with little to no overhead cost from engineering firms. AguaClara's ultimate goal is to provide communities around the world access to free, effective water treatment plant designs. In keeping with AguaClara's philosophy of [open design](#) the Design Tool source is now available for use via an online interface [here](#). You will need updated versions of AutoCAD in order to use the files that the Design Tool will send to you.

## How it works

The ADT provides an interface for the user to input the desired flow rate for their plant design. The Design Tool then sends a request to the AguaClara server to produce a spreadsheet of all variables relevant to the plant design, and the values assigned to each of them. These include pipe diameters, wall dimensions, and baffle dimensions and placement. The ADT uses these variables to scale plant components in AutoCAD to create a complete, three dimensional design of the entire plant and its components.

See the design tool in action in our YouTube video [here](#). Or, you can skip to the end to see the complete water treatment plant design.

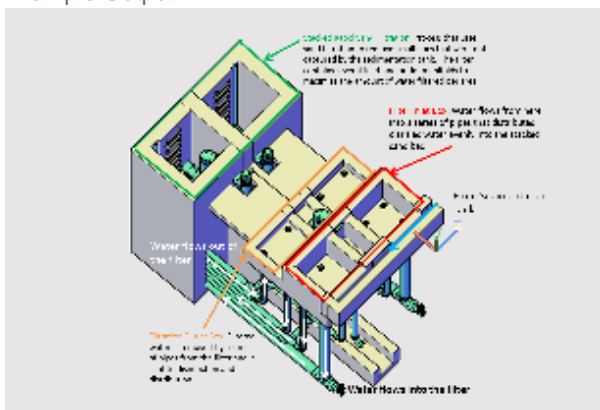
The AguaClara ADT is written by students using engineering calculations in Mathcad. The Mathcad software produces the commands that are sent to AutoCAD. Experience with these pieces of software, and the integration of theoretical and empirical engineering equations with design software has proved incredibly valuable to the students on the design team---it provides realistic professional experience and an effective connection between coursework and actual engineering design.

## Engineering Review Process

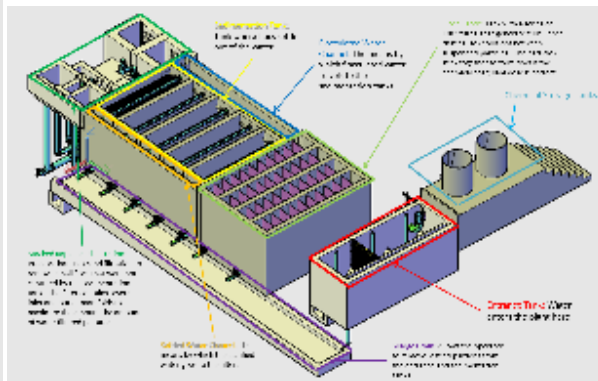
The Engineering Review process is an important safeguard to minimize the risk of facility failures due to faulty design guidelines. As the AguaClara team begins working with multiple partner organizations it becomes increasingly important that steps are taken to ensure that the design tool and any customized design recommendations are carefully reviewed.

For this reason, AguaClara is developing a design validation process to test new releases of the online design tool. The validation process involves independent calculations of flow passage dimensions, reactor dimensions, and water surface elevations. New releases of the design tool will be tested by creating and validating a large number of different designs. In the future, the validation process will be automated and included in the Automated Design Tool package, as a safeguard against errors in the automated system.

## Example Output:



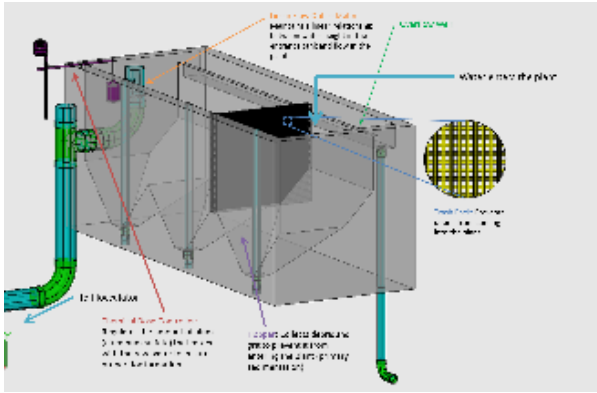
Filter



Overview



Sedimentation Tank



Entrance Tank

## Links

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[3-D Rendering of AutoCAD Output](#)