

Tech Sheet



Modeling StormTech Chambers in HydroCAD®

Tech Sheet # 3
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The following steps provide instructions for modeling StormTech chambers as a pond in HydroCAD. HydroCAD can be used to route a hydrograph through a pond. This document does not address setting up a hydrograph or connecting inlet and outlet devices. This document is for the sole purpose of modeling the chamber stage-storage volume. For information and details on how to set up hydrographs and attached inflow and outlet connections go to www.hydrocad.net.

Please Note: HydroCAD 7.1 has the StormTech SC-310 and SC-740 chamber model profiles built into the software. Users modeling with version 7.0 can download the two chambers models from www.hydrocad.net/stormtech.htm. Right click on the desired chamber model and select “save target as”. The files are then saved in the *Program Files\HydroCAD\Chambers* folder.

In HydroCAD, StormTech chambers are placed or “embedded” in a stone envelope. The first step when modeling the chambers is to enter the dimensions of the stone envelope. The stone envelope includes the one foot (min.) stone perimeter around the chambers and the excavation volume around the manifold (if the manifold volume is to be included in the total storage volume).

To Model StormTech Chambers in HydroCAD:

1. Open HydroCAD and create a new project (If not already in a HydroCAD project)
2. Create a new pond
3. Double click on the pond to open the “Edit” screen
4. On the edit pond screen select “Detention Pond”
5. Click on the “Storage” tab and select “Edit Storage”
6. Select the option for “Prismatoid” in the first row and click OK
7. Enter the invert, length, width and height of the stone envelope
8. Set the following parameters and click OK:
 - a. Embed inside – Nothing
 - b. Storage Multiplier – 1
 - c. Voids – 40% (as appropriate for your stone)
9. Double click on the next blank row below the Prismatoid defined in steps 7 & 8
10. Select “Prefab Chamber”
11. Click on the “Chamber Model” and select the desired StormTech chamber
12. Enter the invert (bottom) of the chamber (StormTech specifications require that this is at least 6 inches above the bottom of the stone)
13. Enter the following parameters:
 - a. Embed Inside – Volume 1 (the Prismatoid previously defined)

- b. Storage Multiplier – Number of chambers for the system
- c. Voids – 100%
- d. Click OK to close the prefab chambers screen

NOTE: The “Embed Inside” field indicates that the chambers are being placed inside the previously defined stone envelope. This will automatically place the specified number of chambers inside the stone bed while removing the displaced stone from the calculations.

14. Additional storages can be defined by in a similar manner. For example to define a manifold a horizontal cylinder (main trunk) can be added as a new line item and embedded inside volume 1. The inlet stubs can be embedded by defining the length of each stub and setting the storage multiplier to the number of stubs.

For example: To embed (20) 12” manifold stubs that are each 18” long set the following parameter:

- a. Double click on the next blank row below the StormTech chamber row
- b. Select “Horizontal Cylinder”
- c. Set the following parameter:
 - i. Set invert elevation – (from plans typically 1 to 2 inches above chamber bottom)
 - ii. Embed Inside – Volume 1
 - iii. Diameter – 12 inches
 - iv. Length – 1.5 ft
 - v. Storage Multiplier – 20
 - vi. Voids – 100%
 - vii. Click OK to close horizontal cylinder screen

15. Click the OK button to save the pond description

16. Double-click the pond to view the data for the chamber system.

17. The “storage” tab contains the information on the modeled chambers (viewable in both tabular and graphical formats).

18. The “Summary” tab contains a report for the overall system including volume of excavation (system only), the volume of the embedded storage, the amount of stone backfill, and the final storage results.

19. Click “Edit” to modify or change any parameters

20. To analyze the behavior of the chamber system under actual rainfall conditions, create one or more subcatchments (or use in an existing design) and route them into the chamber system.

21. Outlets are defined under the “outlet” tab of the pond description. With no outlet, the chamber system will need to be sized to store the entire volume of the design storm runoff.

Note: If a non-rectangular bed is designed, select “Custom Stage Data” in step 6 and enter the surface area at the bottom and top of the stone bed in step 7. (The two areas will usually be the same.) You can uncheck the “Use Large Areas” box to allow entry of surface area in square-feet instead of acres.

For additional details please visit www.hydrocad.net