

When laying out the site, location of the building, driveway, and parking area(s) should take into account the existing conditions of the site. Items to consider during site layout include the existing grades of the property and the soil types. Where possible, the more permeable soils should be used for the pavement areas when an Eco-Cobble System is being proposed.

- NRCS Web Soil Study is a simple way to find the more permeable soils. Using <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>, enter the address site and highlight the property on the aerial photo that comes up on the right. Go to “Soil Data Explorer, Soil Reports” and open “Physical Soil Properties” Report. Hydraulic conductivity is a measure of how permeable the soils are, so choose the ones with higher values.
- Most municipalities prefer to have an actual soil test in the area where the stormwater management (SWM) is proposed. SWM soil test should be performed by a qualified soil scientist for best results.

Once the site layout is determined, it is time to begin the design the stormwater controls. To utilize the Eco-Cobble System, parking areas should be sloped in the direction of the pavers and preferably to a ‘closed’ area like parking stalls which are surrounded by curbs on the low side. The Eco-Cobbles should be kept flat or with slopes under 2% at maximum. The thickness of the stone bed under the pavers should be sized based on the volume of runoff that will be collected and stored there.

- Map the area which is tributary to each paver section/stone bed. Also determine how much is lawn versus impervious and/or Eco-Cobble.
- Storage volume (SV) is calculated as follows:

$$SV = (P/12) \times RF \times A \quad (\text{eq. 1})$$

- SV = required storage volume, cubic feet
- P = rainfall amount, inches. Use maximum design storm per local requirements or ordinances.
- A = area tributary to the storage bed
- RF = recharge factor = $0.05 + (0.009 \times \% I)$
 - % I = area impervious / total area * 100
- The provided storage area is the area of Eco-Cobbles times the depth of stone times the porosity (open space) of the stone. All uniformly graded stone has a porosity of 40% plus or minus. Therefore the depth of stone is determined by:
 - Depth, D = $SV / \text{Area of Eco-Cobbles} \times 0.40$

Sample Design:

The following example is for a small commercial development. The property is approximately 0.8 acres, and it is proposed to build a branch bank office of approximately 1,625 square feet. The parking area is split into three sections and the grading is sloped into the parking stalls. For this example, extra depth of stone for storage will be limited to the stalls themselves. See table.

As can be seen in this example, the depth of stone can vary greatly depending upon the area over which it is spread. All three areas have approximately the same storage volume requirement, however the depth of stone varies from 6-18 inches based on the storage bed area. If the storage were to be spread over the entire Eco-Cobble area, the depth of the stone would need to be 2-4 inches which is less than the minimum subbase depth for a standard paver installation.

