

Interrupting flooding



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Interrupting Flooding The concept is to create a functional design of a rain garden which will solve the problems associated with run off during the heavy rains especially prevention of flooding.

Design constraints: The Constraints imposed on the design result from the sponsors, land surveyors, the residential code and cost factors. The sponsors influence the design by regulating the funding for the project. The designing of the rain gardens require funds for purchasing of plants, purchase of gravel sump, pipes, liner, fertilizers, inlets and outlets, herbaceous plants and woody plants. They also require implementation and maintenance of the rain gardens. The land surveyors limit the implementation of the design related to sizing and siting issues. The rain garden should not be located straight over a septic system, it should also be built in sun and not under obstructions such as canopied trees among pother siting issues. The residential code regulates the construction of a rain garden by providing guidelines which must be followed. The cost of constructing rain garden is another inhibiting factor as the design should be deep enough to be costly.

User profiles and needs: Surveys and interviews were conducted from different residents affected by the run-off during the rainy season to assess the extent of the problem. The users reported the following problems; Increase in pollution, Erosion of soil causes Sedimentation, Metal pollutants harm aquatic life, Stagnation of water increases the number of mosquitos, Contamination of water bodies with pesticides and Contribution of high temperatures among others. The problems are illustrated in the Pareto chart below.

Design objectives: the design objects to solve the problem of the residents who experience high rates of surface run off during the rainy season. The

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design should be able to withstand percolation of water which reduces the amount of water running to the water bodies causing floods. The rain garden is designed to capture excess rainwater from hard surfaces which cannot percolate water such as driveways and cemented surfaces. The rain gardens are designed with beautiful flowers which can be attractive especially when in urban areas with poor drainage. The rain gardens are constructed with special features which enable them to capture the excess surface run-off. There are layers of sandy soil below the rain gardens which reduce the rate at which water enter the water bodies and the creeks. They are also effective in the removal of pollutants caused by fertilizers, nitrogen, dust and other wash off pollutants from the hard surfaces. Rain gardens are very effective as they can be maintained even in urban areas; they reduce runoff and protect the environment form pollution. The percolation amount is estimated by estimating the drainage area, soil type and depth of the rain garden by tests such as soil tests and rain garden size factor.

Design problem statement: The concept of this project is to develop a design which will prevent runoff in areas with poor drainage system so as to prevent pollution of water bodies by the surface runoff. The problem associated with the run off motivates the residents to solve their problem and involves the efforts of the residents, land surveyors, sponsors and is limited by factors like costs, implementation and maintenance.

Work cited

U. S. Environmental Protection Agency (EPA), Public Education and Outreach on Storm water Impacts. Washington, DC. 2008-09-17.