

UNIVERSITI TEKNOLOGI MARA

**EFFECTIVENESS OF LOCAL PLANT
ON SEDIMENT CONTROL IN
URBAN AREA**

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Civil Engineering

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CONFIRMATION BY PANEL OF EXAMINERS

I certify that a Panel of Examiners has met on 20th October 2015 to conduct the final examination of Nurul Ain Binti Salim on his Master of Science thesis entitled “Effectiveness Of Local Plant On Sediment Control In Urban Area” in accordance with Universiti Teknologi MARA Act 1976 (Akta 173). The Panel of Examiners recommends that the student be awarded the relevant degree. The panel of Examiners was as follows:

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Recently, as rapid urbanization takes place, natural vegetation is removed, land slopes are modified and paved over. Sediment from eroded and unstable stream banks and cleared areas were carried by surface runoff in storm water deposited downstream; filling ponds and streambeds reducing the natural river storage capacity and hence causing frequent flash flood occurrence. Current measures taken by the government to overcome these problems using silt fence barrier, sediment traps and sediment pond are mostly costly and not environmental-friendly. Nowadays, the usage of vegetation has been widely used for controlling soil erosion as it is cost effective, easy to handle and it has an aesthetic value. However, limited information has been noted in the used of local plant for suspended sediment control. Therefore, this research was conducted to focus on the usage of local plants as natural method to trap suspended sediment from surface runoff. This research focused on the usage of grass types for suspended sediment control measures. Cow grass, Pearl grass and Phillipine grass are used with a mixed of 0.6 kg sieved soil and 10 L clean water, for different percentage of area covered (25%, 50%, 75% and 100%) at different planting profile which is top and toe. From the results obtained, it is found that at 100% area covered for both planting profile, all covers have successfully retained 100% suspended sediment. For 75% and 50% area covered, highest trapped was recorded at 99.8% and 98.9% by Pearl grass at toe area respectively. While for 25% area covered, highest trapped was recorded at toe area at 96.3% by Cow grass. The lowest trapped was recorded by Phillipines grass at top area for all 75, 50 and 25% area covered at 82.2, 80.5 and 80.0% suspended sediment respectively. This research also shows that plant with wide, long and tall leaves can retain highest amount of suspended sediment from runoff as it formed a denser canopy and these criteria owned by Cow grass and Pearl grass. Overall, toe area has been found to be the best planting profile as percentage recorded by toe area were mostly highest than top area while the best grass to trap suspended sediment are Pearl and Cow grass.

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