

Urban Stormwater Run-off Management Plans for Alajo, a suburb of Accra, Ghana.



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ABSTRACT

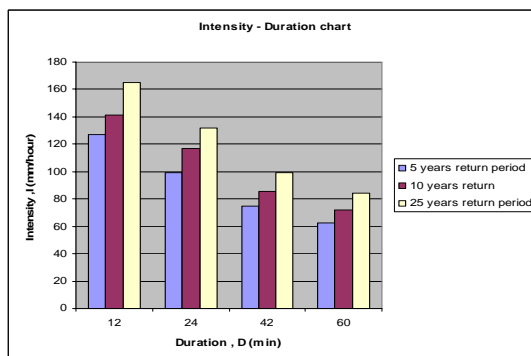
Ghana has two main seasons: the wet and the dry seasons. During the wet season, Accra suffers from severe flooding especially low lying areas like Alajo, a suburb of Accra. Study was carried out on the hydrologic and hydraulic conditions of Alajo using GIS and HEC-RAS software. Efficient storm water facilities were then determined for Alajo to solve the perennial flooding problem.

OBJECTIVE

Design efficient drainage system to control storm water run-off in Alajo, one of the flood prone areas of Accra.

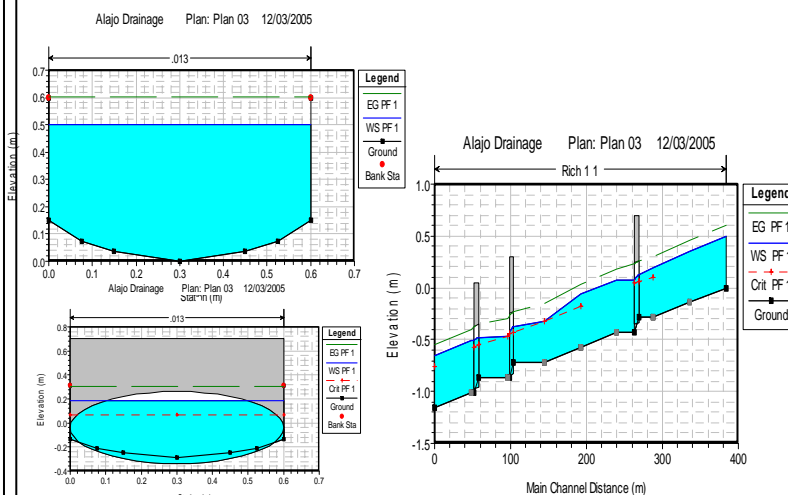
HYDROLOGIC ANALYSIS

- The Rational method was used for this study.
- The following graphical presentation was selected for analysis after computing the time of concentration using Kirpich formular:



RESULTS

The diagram below shows cross-section of the drain and culvert during storm run-off.



DATA ACQUIRED AND USED

- Topographic map
- Meteorological Data
- Soil characteristic Data
- Alajo Road network
- Standard drain and culvert sizes

HYDRAULIC ANALYSIS

- Results from the hydrologic analysis were used to estimated the sizes of the drains and culverts.
- HEC-RAS was then used to determine the hydraulic behaviour and performance of the design drains and culverts.

CONCLUSIONS

- Flow velocity in the drains at certain location is higher than the 1.5m/s assumed. This is as a result of directional changes and has insignificant effect on the material property of the drains.
- Efficient drain sizes were determined from 12 minutes, 25 yrs. Return period rainfall .

RECOMMENDATIONS

- Dumping of refuse into the drains should be avoided.
- Periodic de-silting of the drains are necessary before the rains and dumped at the appropriate place.
- Open bare spaces should be grassed to check erosion.

