



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

**FACULTY OF ENGINEERING AND
TECHNOLOGY**

DEPARTMENT OF WATER RESOURCES ENGINEERING

FINAL YEAR PROJECT REPORT

**DESIGN OF A DRAINAGE NETWORK FOR KIKINDU
MARKET**

By

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BU/UP/2020/0362

**A final year project submitted to the Department of Water Resources Engineering in
partial fulfillment of the requirements for an award of Bachelor's Degree of science in
Water Resources Engineering**

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ABSTRACT

Kikindu market is one of the local markets located in the Northern division of Mbale city. It has been a victim to flooding whose cause is greatly aligned to the increasing storm runoff alongside with the poor drainage network. Factors such as increased impervious surfaces alongside high rainfall intensities have been accountable for the increased runoff which has in turn overwhelmed the existing drainage network. To cope up with the ongoing dynamics, a hydrological and hydraulic study. Flood analysis was done using the extreme weather distribution for 5, 10, 25, and 50year returns periods for analyzing the hydrological characteristics and whereas Arc GIS 8.2 was used for analyzing the hydraulic characteristics. The design criteria as per the MoWT drainage design manual (2010) was highly observed. HEC-RAS 6.7 software was used for modeling and simulating the different sections of the drainage network. The final design comprised of different channel sections that were to be constructed using stone masonry. Most sections of the drainage network had a trapezoidal shape and 808m was found to be the overall length of the entire network. The drainage network is expected to effectively and efficiently function for 20years with a 55.8% probability of non exceedence under different conditions such as proper solid water management and continuous maintenance.

Key word: hydraulic, hydrologic, and HEC-RAS

DECLARATION

I the undersigned, declare that this research proposal is my original work, except where acknowledgment has been made. I declare that this work has never been submitted to this University or any other institution for funding/ or partial fulfillment for any award.

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SUPERVISOR'S APPROVAL

This research project is submitted as a partial fulfillment for the award of Bachelor's Degree in Water Resources Engineering at Busitema University, with our approval as the academic supervisor.

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SIGN: 

DATE: 10th May 2025

DEDICATION

This work is dedicated to my parents Mr. Namunyala Majeed Samaali, Ms. Nadunga Zainah and Ms. Namasaba Sarah for nurturing me to this level and never giving up on me. I also dedicate this report to my beloved siblings and Uncle Mr. Abu Kitongo for their support. Special dedication goes to all my friends who have been there to see me succeed.

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LIST OF ABBREVIATIONS

ASL	Above Sea Level
BOQ	Bill of Quantities
DEM	Digital Elevation Model
EPA	Environmental Protection Agency
GIS	Geographical Information System
GPS	Global Positioning System
HEC-RAS	Hydrological Engineering Centre-River Analysis System
IDF	Intensity Duration Flow
NDG	National development Goal
LULC	Land Use and Land Cover
MoWT	Ministry of Works and Transport
SDG	Sustainable Development Goal
SWMM	Storm Water Management Model

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