

**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**FACULTY OF ENGINEERING AND TECHNOLOGY**

**DEPARTMENT OF WATER RESOURCES ENGINEERING**

**FINAL YEAR PROJECT REPORT**

**DESIGN AND FABRICATION OF AHOLLOW FINN BUILDER**

**MOULD**

**By**

**IKWARE IVAN -BU/UP/2018/3624**

**SUPERVISOR: Dr LWANYAGA DDUMBA JOSEPH**

*Final year project report is submitted to the department of mining and water resources engineering in partial fulfilment of the requirement for the award of Bachelors of Science degree in water resources engineering at Busitema University.*

**APRIL 2023**


## ABSTRACT

This project presents the design and Fabrication of hollow Finn Building machine which will be used for construction of hollow concrete wall structures. The aim of this project is to fabricate hollow Finn Builder mould. Finn Builder is an innovative building technique which is used for construction of concrete wall structures. The technology involves the use of building mould made up of rigid material mild steel. The advantages of Finn builder walling technology are Versatility of the mould to build different types of concrete structures, time Efficiency due to prefabricated nature of mould allowing assembling and disassembling easily, cost effectiveness of the mould due to reusable nature of the mould reducing frequent purchase, less labour is required to operate the mould, durable and low maintenance costs. The existing Finn Builder mould lacks design provision for hollow wall concrete construction. The creation of holes in wall of a structure has advantages of reducing the weight of structure leading to reduced load on foundation, reduced material usage (concrete) due to holes which reduce the amount of concrete used for building hence reducing construction costs. The contribution of this project is to reduce the weight of structure which reduce foundation requirements and reduce material usage which leads to reduced construction costs. Fabrication of Finn builder mould components and test performance of the mould was also covered. The test results of concrete are also presented in this report(the slump test and compressive strength tests).

Key words: Finn Builder, Fabrication, Innovated, simulation and rigid materia

DECLARATION

I IKWARE IVAN a student of Busitema University with a registration number of BU/UP/2018/2018 hereby declare that this report is a true work of my hands and has never been presented by any person or institution for an academic award.

Signature: .....  .....

Date: ..... 27<sup>th</sup> / 11 / 2023 ..... .....

APPROVAL

This final year project report is submitted as a partial fulfillment for the award of bachelor's degree in water resources engineering of Busitema University, with approval from my project supervisor.

Name..... Dr. Joseph Odumba Lwanyagi

Date..... 2023-02-07

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## DEDICATION

I dedicate this final year report to my God, parents and siblings including myself.

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## ACRONYMS

ACRONYMS	MEANING
IMF	International Monetary Fund
CTM	Concrete testing machine
WHO	World Health Organization
Etc.	And others (on citations).
UN	United Nation
UNBS	Uganda national bureau of standards
Mm	Millimeters
ASCE	American Society of Civil Engineering
ISO	International Organization for standardization

PVC	Poly vinyl chloride

# CHAPTER ONE

## 1 Introduction

This chapter comprises of Background, problem statement, Objectives, Justification, and Scope of the study.

### 1.1 Background

Housing has and forever will remain an essential need for the existence of mankind. In his existence on earth, man has shown transition from ancient such as Neolithic construction using bones, stone, metal, bamboo, and clay to modern construction techniques. The oldest archaeological evidence of house construction comes from the well-known Olvai George in Tanzania (Koerth, 2018). The ancient Greeks like Egyptians and Mesopotamians made many advances in technology including plumbing, the spiral staircase, urban planning and many more. The great romans development in building materials was the use of hydraulic lime mortar called Roman cement (Oguz et al., 2014).

As years go by, housing has incorporated the aspect of thermal comfort. In Europe , wooden houses were built due to excellent mechanical properties, light weight and easiness to shape timber, however this compromised the strength and durability of structure (Smith & Snow, 2008). According to IMF, housing is recognized as an essential sector of the economy but there is still inadequate housing for rapidly increasing population (Zhu, 2014). Globally, more than 1.8 billion people around the world lack adequate housing, 15 million people are forcibly evicted every year and 150 million people are living in homelessness (McRae, 2022). According to UN organization (2017), inadequate housing in the world has been attributed to high costs of construction . One of an innovative low-cost house method of construction is use of Finn Building technology. Finn Builder technology is an innovative building system which was discovered in South Africa by Frank Finn more in 2001. The Finn builder utilizes no slip concrete, in-situ made from the mixture of cement, sand, aggregate and water. Frank Finn more was prompted to develop the building mould due to the need to meet the huge demand for low-cost housing (Mugisha, 2019). The concrete is finned into the mould and compacted with hand compactor, it is then levelled using a spirit level and excess concrete is squared off using a float. The panel release level is pushed down to release the side panels and the Finn Builder is moved forward. The first steel building mould was used in South Africa for building circular concrete wall of reservoirs for farmers. This was later developed into adjustable mould which can be used for construction of external and internal concrete wall structures of different wall