

**UNIVERSITI TEKNOLOGI  
MARA**

**MULTIPURPOSE DRAIN  
COLLECTOR**

**ROCKY MARTIN ANAK MBAS**

Dissertation submitted in partial  
fulfillment of the requirements for the  
degree of **Diploma**  
**(Mechanical Engineering)**

**College of Engineering**

**Jul 2023**

## **ABSTRACT**

An abstract multipurpose drain collector is a device or system designed to collect and manage various types of waste or fluids that flow through a drain. It is typically used in industrial or commercial settings where there is a need to control and dispose of different types of waste materials efficiently.

The drain collector is designed to fit over a drain or multiple drains and prevent any unwanted materials from entering the drainage system. It may consist of a durable and corrosion-resistant material, such as stainless steel or high-density polyethylene, to withstand the harsh conditions and chemicals commonly found in industrial environments.

I have designed this significant project to solve all the problems that consumers face in their daily lives. The multipurpose drain collector is also able to be used in any size of drain. This project also functions well to collect trash from drain completely to the boxes in prototype. The design process involves a thorough analysis of existing automated drain collectors, market requirements, and user preferences. Analysis on the prototype is made by using a computer-aided program also known as Solidworks to determine the functionality of the prototype and how much trash can be loaded in drain collector to fulfil the objective.

The specific design and capabilities of an abstract multipurpose drain collector can vary depending on the intended application and the types of waste materials involved. It is essential to consider local regulations and environmental standards when selecting or implementing such a system to ensure compliance and safe waste management practices. Results shown multipurpose drain collector able to collect solid waste from drain to the baskets effectively.

In conclusion, my design for this project, multipurpose drain collector can solve problems in various sizes of drain and this product is able to collect the rubbish effectively. It can be concluded that the task for FYP 2 to build a multipurpose drain collector that has achieved its objective is fulfilled.

## **ACKNOWLEDGEMENT**

Firstly, I wish to thank God for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor, DR. Azizul Hakim bin Samsudin.

Finally, this dissertation is dedicated to my father and mother for the vision and determination to educate me. This piece of victory is dedicated to both of you.

# TABLE OF CONTENTS

	<b>Page</b>
<b>CONFIRMATION BY SUPERVISOR</b>	<b>ii</b>
<b>AUTHOR'S DECLARATION</b>	<b>iii</b>
<b>ABSTRACT</b>	<b>iv</b>
<b>ACKNOWLEDGEMENT</b>	<b>v</b>
<b>TABLE OF CONTENTS</b>	<b>vi</b>
<b>LIST OF TABLES</b>	<b>vii</b>
<b>LIST OF FIGURES</b>	<b>viii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>ix</b>
<b>CHAPTER ONE : INTRODUCTION</b>	<b>11</b>
1.1 Background of Study	11
1.2 Problem Statement	13
1.3 Objectives	13
1.4 Scope of Study	13
1.5 Significance of Study	14
<b>CHAPTER TWO : LITERATURE REVIEW</b>	<b>15</b>
2.1 Benchmarking/Comparison with Available Products	15
2.2 Review of Related Manufacturing Process	19
2.3 Patent and Intellectual Properties	20
2.4 Summary of Literature	22
<b>CHAPTER THREE : METHODOLOGY</b>	<b>25</b>
3.1 Overall Process Flow	25
3.2 Detail Drawing	25
3.3 Engineering Calculation and Analysis	30
3.4 Bill of Materials and Costing	35
3.5 Fabrication Process	36

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of Study

The history of drainage systems can be traced back to ancient civilizations. In fact, some of the earliest drainage systems were developed by the ancient Indus Valley civilization, which flourished in what is now Pakistan and India from about 2600 BCE to 1900 BCE.

The ancient Romans were also renowned for their sophisticated drainage systems. They built extensive networks of aqueducts and sewers to channel water and waste away from their cities. The Cloaca Maxima, for example, was a large sewer system built in Rome in the 6th century BCE that is still in use today.

During the Middle Ages, drainage technology advanced slowly, and many towns and cities in Europe relied on open ditches or cesspits to dispose of waste. It wasn't until the 19th century that modern drainage systems began to emerge. The introduction of indoor plumbing and water closets led to the development of underground sewer systems that carried waste away from homes and buildings.

Today, modern drainage systems are an essential part of urban infrastructure. They help prevent flooding, protect public health, and ensure the proper disposal of waste and wastewater. Advances in technology have also led to the development of more efficient and environmentally friendly drainage systems, such as rain gardens and green roofs, which use vegetation to capture and filter rainwater.

A drain is a plumbing fixture that is designed to carry away wastewater and other liquid waste materials from homes, buildings, and other structures. There are many different types of drains, including floor drains, sink drains, bathtub drains, and toilet drains.

Drains typically work by using gravity to move water and waste materials through a series of pipes and into a septic tank or sewer system. In homes and buildings that are connected to a municipal sewer system, wastewater