DESIGN OF WATER SUPPLY SYSTEM OF BRGY. MALABAG, SILANG, CAVITE

Design Project

JOEVEEN A. LACADMAN
MARYLYN A. CARIASO

College of Engineering and Information Technology
CAVITE STATE UNIVERSITY
Indang, Cavite

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Undergraduate Design Project
Submitted to the Faculty of the
College of Engineering and Information Technology
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In partial fulfillment
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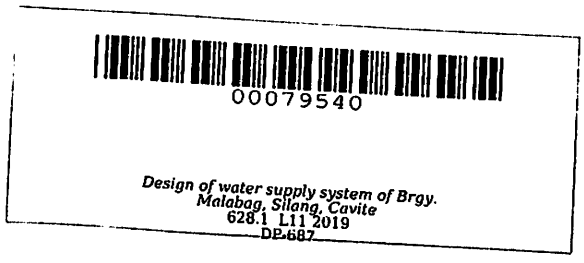

JOEVEEN A. LACADMAN
MARYLYN A. CARIASO
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ABSTRACT

LACADMAN, JOEVEEN A. and CARIASO, MARYLYN A. Design of Water Supply System of Brgy. Malabag, Silang, Cavite. Undergraduate Design Project. Bachelor of Science in Civil Engineering. Cavite State University Indang, Cavite. June 2019. Adviser: Engr. Renato B. Cubilla.

The design project was conducted from August 2018 to April 2019. It was evaluated on April 2019 at the College of Engineering and Information Technology.

The proposed design of the new water supply system of Malabag, Silang, Cavite intended to provide additional supply of water with the use of the data from the Silang Water District. The design recommended how to improve in order to satisfy the water consumption demand for the upcoming years.

Specifically, it aimed to: 1. enhance the skills of the researchers; 2. enhance the knowledge of the researchers in designing a water supply distribution system using EPANET; 3. provide a design of an elevated steel water tank; and 4. determine the estimated cost of the system, including earthworks, concrete works, elevated water tank, pipelines and fittings.

The study provided the architectural and structural details of the proposed elevated water tank designed to supply a projected population of 4,043. A simulation of water distribution network was presented using EPANET. Architectural plans included elevation plans of water tank; structural plans included details of elevated water tank, tie beam, concrete pedestal, and pedestal footing.

The analysis of individual structural member was obtained with the aid of Structural Aided Analysis and Design (STAAD) software.

The design of the structural members was done following the procedures, requirements and specification as per American Institute of Steel Construction (AISC) manual, American Water Works Association (AWWA) standard, Association of Structural Engineering of the Philippines Inc., (ASEP) Handbook, and National Structural Code of the Philippines (NSCP) standard ACI Code. According to the design computation and analysis, it can be concluded that all section and materials used were safe, efficient and economical.

The estimated total project direct cost of the water supply system is Php 3,369,903.822.

The authors recommend an in-depth study about other structural member regarding the design of the elevated water tank; also to conduct a comparative analysis between manual hydraulics computation and software simulation results in the analysis of transmission and water distribution mains.

TABLE OF CONTENTS

LIST OF APPENDIX TABLES

LIST OF APPENDIX FIGURES

LIST OF APPENDICES

DESIGN OF WATER SUPPLY SYSTEM OF BRGY. MALABAG, SILANG, CAVITE

Joeveen A. Lacadman
Marylyn A. Cariaso

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INTRODUCTION

Water is an essential aspect of daily life especially for a household consumption. Each household deserve an access to clean and sustainable water for daily consumption. Almost about seventy percent of the world is covered by water but only one percent of our freshwater is easily accessible. Estimates vary, but each person uses about 80-100 gallons of water per day for the typical water usage at home. As the population increases, the demand of water also increases over time. In order to sustain the consumer demand of water every day, appropriate utilization and distribution of water must be established.

Silang is a first class municipality in Cavite and is politically subdivided into 64 barangays. Malabag as one of the barangay in the municipality of Silang has a population of 3,581 as determined by the 2015 Census. The latest census figures in 2015 denote a positive growth rate of 1.13% or an increase of 206 people, from the previous population of 3,375 in 2010 (www.PhilAtlas.com). The increasing rate of population requires the barangay to provide efficient potable water supply for its daily consumption.