PROPOSED DESIGN OF A DRAINAGE SYSTEM ALONG BARANGAY POBLACION, INDANG, CAVITE

Design Project

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ABSTRACT

ARIBAN, MARK GEROME E., and TARROJA, RALPH JESON C. Proposed Design of a Drainage System Along Barangay Poblacion, Indang, Cavite. Undergraduate Design Project. Bachelor of Science in Civil Engineering. Cavite State University, Indang, Cavite. May 2017. Adviser: Engr. Roslyn P. Peña

The Proposed Design of Drainage System along Barangay Poblacion, Indang, Cavite was conducted from August 2016 to March 2017 at Cavite State University. The study aimed to provide a design of drainage system along Barangay Poblacion, Indang, Cavite which can be used as reference of incoming Civil Engineering students, Municipality of Indang, and Cavite State University for future implementation. The study included the design of drainage system, detailed cost estimates of materials and labor used using man-hour basis method.

The objectives of the study were to provide a drainage system along Barangay Poblacion, Indang, Cavite. Specifically, it aimed to increase and enhance the authors' knowledge about designing drainage system, provide design of the drainage system, provide the detailed cost estimate and specification of the drainage system, and provide tarpaulin to showcase the study.

The drainage system adopted the Reinforced Culvert Pipe. The diameter of RCP per drainage line were computed to be the most efficient and economical design. The storage capacity of the treatment plants per day of Cluster 1, Cluster 2, Cluster 3, treatment plant 1 and treatment plant 2, were 64,696 m^3/day, 95,584 m^3/day, 42,456.96 m^3/day, and 83,678.4 m^3/day, respectively. Cluster 1, Cluster 2, and Cluster 3 treatment plants were located at Trece Martires-Indang Road, Indang-Alfonso Road, Indang-Naic Road for treatment plant 1, and Indang-Alfonso Bypass Road for treatment plant 2, respectively. The study revealed that the estimated

materials and labor costs for Php 5,964,760.97 and Php 13,554,180.00, respectively. The total project cost were Php 19,518,940.97.

The authors recommend the use of Rational Method for the computation of discharge for small drainage area, and the use of Manning's formula for computing the drainage dimension. In addition, the authors also recommend to design appropriate drainage systems to the study area for the effective and efficient flow of storm water to designated outfalls. And lastly, the design of sewage treatment facility must be enough or better yet has definite allowance, to carry the discharge of storm water and sewage.

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PROPOSED DESIGN OF A DRAINAGE SYSTEM ALONG BARANGAY POBLACION, INDANG, CAVITE

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An undergraduate thesis presented to the faculty of the Department of Civil Engineering, College of Engineering and Information Technology, Cavite State University, Indang, Cavite in partial fulfilment of the requirements for the degree of Bachelor of Science in Civil Engineering with Contribution No. CEIT-2016-17-12. Prepared under the supervision of Engr. Roslyn P. Peña.

INTRODUCTION

Water is the most important compound ensuring life in this planet. But on roads, the presence of water means mainly trouble. A main cause of road damage, and problems with the serviceability of road networks, is excess water filling the pores of road materials in the road and in the subgrade soils. That is why proper drainage system helps guide water flow in order to remove it from the ground surface.

One of the essential components of a community is the maintenance of its sanitation through drainage system. It provides uniform drainage of storm water to prevent flooding as it discharges the water to a drainage basin or outfall. Drainage is the removal of surface or subsurface water from a given area by natural or artificial means. The term is commonly applied to the removal of excess water by canals, drains, ditches, culverts, and other structures designed to collect and transport water either by gravity or pumping (De Leon and Perlado, 2014)

The municipality of Indang is a first class municipality in the province of Cavite, Philippines. It has a land area of 74.90 square kilometer, a population of 65,599 people,