

**A PROPOSED DESIGN OF AN INTERCHANGE AT CARMONA BYPASS
ROAD AND CABILANG BAYBAY ROAD INTERSECTION AT
POBLACION, CARMONA, CAVITE**

Undergraduate Design Project
Submitted to the Faculty of the
College of Engineering and Information Technology
Cavite State University
Indang, Cavite

In partial fulfillment
of the requirements for the degree
Bachelor of Science in Civil Engineering

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June 2018

ABSTRACT

ENRIQUE, EARL JUSTIN S. and GARCES, LUISITO R., JR. A Proposed Design of an Interchange at Carmona Bypass Road and Cabilang Baybay Road Intersection at Poblacion, Carmona, Cavite. Undergraduate Design Project. Bachelor of Science in Civil Engineering. Cavite State University. Indang, Cavite. June 2018. Adviser: Engr. Larry E. Rocela

The collection of data and structural design of the interchange was conducted from September 2017 to June 2018 at Carmona, Cavite and Cavite State University, Main Campus, respectively.

Carmona Bypass Road, a six-lane part of Emilio Aguinaldo Highway carries a huge amount of traffic connecting Cavite and Laguna provinces. It also serves as an industrial road because it is the main passageway of an industrial zone, People's Technology Complex. With that said, the road is expected to be efficient in servicing moderate to heavy traffic from lightweight vehicles to heavy trucks. Moreover, the presence of intersecting road, Cabilang Baybay Road, adds to the slow traffic in the intersection because of the need to provide signaling system for safety. Therefore, there is a need to upgrade the intersection to an interchange to allow smooth transition in the intersection. From that, the researchers proposed a design of an underpass interchange with a 4- lane depressed freeway along the Carmona Bypass Road and two bridges to allow left turning vehicles from the intersecting road.

The objective of this study was to conduct an analysis and design of an interchange, as well as to prepare architectural and structural plans, and to provide a detailed cost estimate of the interchange.

The estimated overall project cost of the interchange is P 112,827,015.90.

Highway engineering design was adopted from AASHTO Geometric Design of Highway and Streets and DPWH Highway Safety Design Standard. The design of the bridge was adopted from the specifications of NSCP Vol.2 Bridges and DPWH Design Guidelines, Criteria and Standards Vol.5 Bridge Design.

The study excluded the design of pump and culverts for storm drainage purposes and its detailed cost estimate as it requires a full on hydraulic analysis of the proposed interchange. However, it was recommended to be done as a future dissertation. Some of the components of the bridge which were not to be considered as a part of the integral system of the designed bridge were adopted from standards of DPWH. (eg. dimensions of railing and post is as per recommended, the reinforcement and detailing of approach slab, curb and pavement)

The designed interchange was extending to 275 meters with four-lane depressed freeway with a width of 12 meters and two 2.85 meters wide frontages road. The left turns were 12.4 meters span reinforced concrete bridges with a width of 8.8 meters and a vertical clearance of 5.45 meters. The height of retaining walls on the sides of the depressed freeway ascending the 6.58% the road grade are 7 m, 5.25 meters, 4.05 m and 2.5750 m, respectively.

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