

DEVELOPMENT PLAN OF TARTARIA WEST  
ELEMENTARY SCHOOL, SILANG, CAVITE

Design Project

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**DEVELOPMENT PLAN OF TARTARIA WEST ELEMENTARY  
SCHOOL, SILANG, 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



*Development plan of Tartaria West  
Elementary School, Silang, Cavite  
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## ABSTRACT

**SANDOVAL, REGINA MAE T. and TADIFA, AIMIE G. Development plan of Tartaria West Elementary School, Silang, Cavite.** Undergraduate Design Project. Bachelor of Science in Civil Engineering. Cavite State University. Indang, Cavite. May 2017. Adviser: Engr. Marcelino A. Dagasdas Jr.

The development plan of Tartaria West Elementary School, Silang, Cavite was conducted from August 2016 to March 2017 at Cavite State University – Main Campus.

The objective of the study was to prepare a physical development plan and to design a five-storey school building to address the need of classrooms of Tartaria West Elementary, Silang, Cavite. The lot allotted for the school area of 1314.981 square meters and the proposed building has an area of 351.50 square meters. The development plan is composed of a five-storey school building. The study included the architectural plan and structural plan and structural details of proposed building. It also included the layout of plumbing and electrical in the proposed five-storey building.

Based on the design and computation the design of tie beam has 250 mm by 150 mm section. The reinforcements used are 6-16 mm  $\emptyset$  bars. The stirrups used were 10 mm  $\emptyset$  steel bar spaced 1 at 50mm and rest at 150mm on center. In beam 1 section 300 mm by 450 mm and 28 mm  $\emptyset$  main reinforcing bars was used. The stirrups used were 10 mm  $\emptyset$  steel bar spaced 1 at 50 and rest at 175 mm on center. In designing roof beam section 400 mm by 250 mm and 25 mm  $\emptyset$  main reinforcing bars was used. The stirrups used were 10 mm  $\emptyset$  steel bar spaced 1 at 50mm and rest at 150 on center. In designing column 1 dimensions obtained were 400 mm x 400 mm. Column 1 were reinforced with 12-20 mm  $\emptyset$  bars with 10 mm  $\emptyset$  lateral ties spaced 1 at 50 mm and the rest at 200 on center. Column

2 has dimension of 300 mm x 300 mm. Column 2 were reinforced with 8-16 mm  $\emptyset$  bars with 10 mm  $\emptyset$  lateral ties spaced 1 at 50 mm and rest at 175 on center. In footing design 1 the dimension of 3 m x 3 m with total depth of 425 mm was used. Footing 2 has a dimension of 1.4 m x 1.4 m with total depth of 200 mm. Combined Footing has a dimension of 3.6 m x 0.8 m with total depth of 450 mm and reinforcement of 3-25 mm  $\emptyset$  bar on both ways for support 1 and 4-25 mm  $\emptyset$  on both ways for support 2 and 4-25 mm  $\emptyset$  on the top.

The estimated total project cost of the proposed building is PhP 24, 326, 504.00

The engineering software STAAD (Structural Aided Analysis and Design) was used in the analysis of building frame. The guidelines set by the National Structural Code of the Philippines (NSCP) and American Concrete Institute (ACI) were followed in the design computation. The maximum moment, shear and axial loads were the basis for the design.

All needed specifications were followed in the design process. Detailed analysis of the design was proven safe and economical after the manual computation of the design.

Based on the result of the study, the authors recommend conducting soil boring test to aid all design computations. The researchers also recommend the following to be able to accomplish the site development plan of the campus. First, construction of kiosk to avoid the hallway to being crowded with students. Second, the landscaping of the area in order to improve the aesthetic appearance of the site so that it could be more pleasing to the visitors.

It is recommended that this design project be used for its future implementation and serve as reference for future researchers of structural design project and development plan.

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# **DEVELOPMENT PLAN OF TARTARIA WEST ELEMENTARY SCHOOL, SILANG, CAVITE**

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An undergraduate design project submitted 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-2016-17-2-011. Prepared under the supervision of Engr. Marcelino A. Dagasdas, Jr.

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## **INTRODUCTION**

Reinforced concrete may be the most important material available for construction. It is used in one form or another for almost all structures, great or small—buildings, bridges, pavements, dams, retaining walls, tunnels, drainage and irrigation facilities, tanks, and so on. It has considerable compressive strength per unit cost compared with most other materials. Reinforced concrete has great resistance to the actions of fire and water and, in fact, is the best structural material available for situations where water is present. During fires of average intensity, members with a satisfactory cover of concrete over the reinforcing bars suffer only surface damage without failure. Reinforced concrete structures are very rigid. It is a low-maintenance material. As compared with other materials, it has a very long service life. Under proper conditions, reinforced concrete structures can be used indefinitely without reduction of their load-carrying abilities (McCormac, 2005).