

Thesis Title	Modular Design for Secondary Schools' Building, Department of General Education
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ABSTRACT

This Research was designed to relate the Modular Design for Secondary School Building, Department of General Education, to the study of its existing buildings, for use as guidelines into the modular design for building, for its adjustment of the buildings and modular design to be in conformity with the building's actual users. The aim was with the secondary school building, department of general education under the category of 318 Lor, with its scope of study at the number of 68 schools located in Bangkok and nearby provinces, and sampling group through the size allocation by Krejcie and Morgan Tables, earning the number of 60 schools. After that it was sampled in a simple manner by lottering method. When it came up with the schoolnames, the researcher then collected information from the school's director and academic assistant at 2 persons from each school, totaling 120 persons.

The researching method of this study was Questionnaire, which was divided into 3 segments, the first segment was the general information for the Respondents while the second segment was the notions related to presently-used conditions of the building. The third segment dealt with additional suggestions of the Respondents, and the percentage used in this Research,

It was found in the study that most directors and their academic assistants were male, with their ages over 45. The highest degree among them was bachelor with over

20 years working experience. The problem was insufficient space of size, floors, number of classrooms, so its was increased from 4 floors to be 6 floors, from 18 classrooms to be 32 classrooms. The classroom's category was suggested to meet various demands suitable to each school's location. The ground floor was to be in open-space to be adapted for recreational purposes, managerial functions-facilities, libraries, auditoriums, etc. The corridor should be moduled with good ventilation systems. The sound's diffusion was good as it did not produce any echoes while the structural pattern was economical with its sun-screen designed to ventilate heat which is suitable for countries in the tropical zone. The light was controlled to touch the building at its least by emitting its verandah to provide protection against sunlight. Additional ventilating-channels were placed over the door-frame throughout its linear length which would enable classrooms to get the breezing winds. Bathrooms and toilets were additionally constructed at every floor to give more convenience to teachers and students at the same time. They were built at appropriate locations. With the foot-space at floor four's stairway which was used as storage room was suggested to have more storages at every levels, employing the foot-space of the ladder to economize space. The paving in classroom was with cost-saving flooring but durable and easily-maintained. The electric system was wired in piping system to avert heat, moisture and fire-accident from short circuit and with emergency light, waterworks system and proper watertap for different needs and also with water-tank on the ground for use in consumption and subsistence, with reserves to fight fire. Internal and external painting of the buildings was in lighter tone with its drainage through PVC pipes to flush out clogged-water at areas in the building. Sewer system and air-ventilation pipe used in zinc-coated iron or in hard PVC, The sewerage pipe was fixed or put into the ground used with asbestos cement or baked-clay which were sold in the market with TIS standard. At the stair's foot which was prone with accidents was installed with resistant materials against slippery or making wedge at stair's nose. Fire-extinguishing system was a hand-held equipment suitably at 1 equipment/ 1 floor and with its box at every floors of the building. Prevention against lightning was with lightning-conductor putting into the ground at every 30 m length and with US standard of NEC for safety. The height

of the ground's hall was more than the present one. Given with such height it was aimed to avert any feelings of uneasiness and suitable for use with the building's ground floor.

Its structural design and building's systems were with main construction materials, i.e., concrete and iron, base and foundation post, pillar and beam casted in fixed position with CPAC processed-hollow-floor and paving material in varnished cement. Toilet-paving was in ceramic tiles and walls in CPAC's light walling, its wall covered with ceramic tiles. Mon-bricks used at the lift's hall with TIS standard, staircases to be firmly fixed, roofing in iron covered with asbestos tiles. All pitches and waterway at ground floor were under sanitary engineering standards, with one lift for 15 passengers, 120 MPM for speed and with split-type air-conditioning system.

Through this study it was found that the existing design for school building of 318 Lor, was costed at 44,066,521.63 Baht. The new 318 Lor model would cost at 36,026,282.90 Baht which is less than the present one at 8,040,238.73 Baht or at 22.3% of the previous estimation with also lesser time of construction at 6 months. The study results over this modular design were proven with faster time of construction and time-saving. It was more economical through the savings of labor, wooden-frame cost, craftsmanship expenses. All these advantages put the prices down and made it suitable for secondary school building, department of general education, with tendencies to expand curriculum to senior secondary level (NESDB Plan No. 8) which would meet increasing demands from the students in the future and to meet with planning on time schedule and budget-saving policy of the government.