

Y.T.U.
FACULTY OF CIVIL ENG., CIVIL ENG. DEPARTMENT
2023-2024 FALL TERM, REINFORCED CONCRETE STRUCTURAL DESIGN

STUDENT	H	G	F	E	D	C	B	A	NAME	
NUMBER									SURNAME	

Story Height (h) : 320 cm
 Story Number (for odd numbers) : Ground floor + 2 normal floors
 Story Number (for even numbers) : Ground floor + 3 normal floors
 Intended purpose of the building : Commercial (Business center)

$a = (550+A+B)$ cm
 $b = (415+2C+A)$ cm
 $c = (435+2B+3C)$ cm
 $d = (470+3A+2B)$ cm

	LOCATION OF THE STRUCTURE	MATERIAL	LOCAL SITE CLASS	ALLOWABLE SOIL PRESSURE (kN/m ²)
Odd Numbers	LAT.: 41.02477, LONG.: 28.88888	C30/B420C	ZB	(280+A+B+C)
Even Numbers	LAT.: 41.05202, LONG.: 29.00999	C35/B420C	ZC	(265+A+B+C)

Exterior walls, interior walls and walls surrounding stairways are composed of 19 cm thick hollow tiles, 13,5 cm thick hollow tiles and 19 cm thick structural tiles with vertical hollow cells, respectively. There shall be suspended ceilings everywhere except balconies and stairway landings.

The structural system of residential building whose floor plans are given in the figure shall be designed, and calculations and design of reinforced concrete structural members shall be accomplished. The order of calculations and drawings are given below. The last approval date for each item is given in paranthesis..

Note1: Stairhead is carried by infill wall. There is no connection between the landing and beams in the short direction.

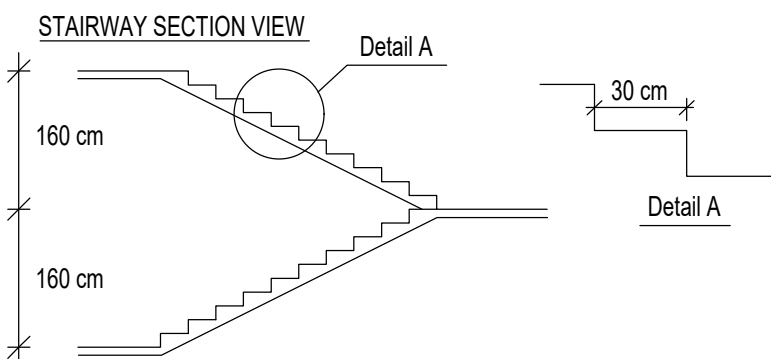
Note2: The locations of columns are shown in the floor plans symbolically. The dimensions and orientations of columns shall be determined by students.
Beam formwork plan shall be composed by students according to the architectural plan.

- 1-Composing the structural system and drawing the formwork plan (13/10/2023)
- 2-Slab design and drawing slab reinforcements on the formwork plan (20/10/2023)
- 3-Analysis and design of stairs (27/10/2023)
- 4-Preliminary design of columns and beams (03/11/2023)
- 5-Analysis of (2-2) axis of ground floor ceiling under vertical loads (17/11/2023)

AN APPROVAL SHALL BE TAKEN FOR THE COMPLETION OF FIRST 5 ITEMS UNTIL 01/12/2023 OTHERWISE THE STUDENT CANNOT PROCEED TO THE COURSE AND WILL BE CONSIDERED "FAILED".

- 6-Structural analysis under lateral (seismic) loads (08/12/2023)
- 7-Design of the beams along 2-2 axis (15/12/2023)
- 8-Design of the ground and first floor columns at the intersection of 2-2 and A-A axes, check for strong column-weak beam requirement shear safety of beam-column joint (22/12/2023)
- 9-Footing design (29/12/2023)
- 10-Drawings (05/01/2024)

- Slab formwork plan and slab reinforcement detailing (1/50)
- Ground floor column application plan and column reinforcement detailing (1/50-1/20)
- Stairway reinforcement detailing (1/20)
- Beam reinforcement detailing (1/20)
- Footing formwork plan(1/50)
- Footing reinforcement detailing (1/20)



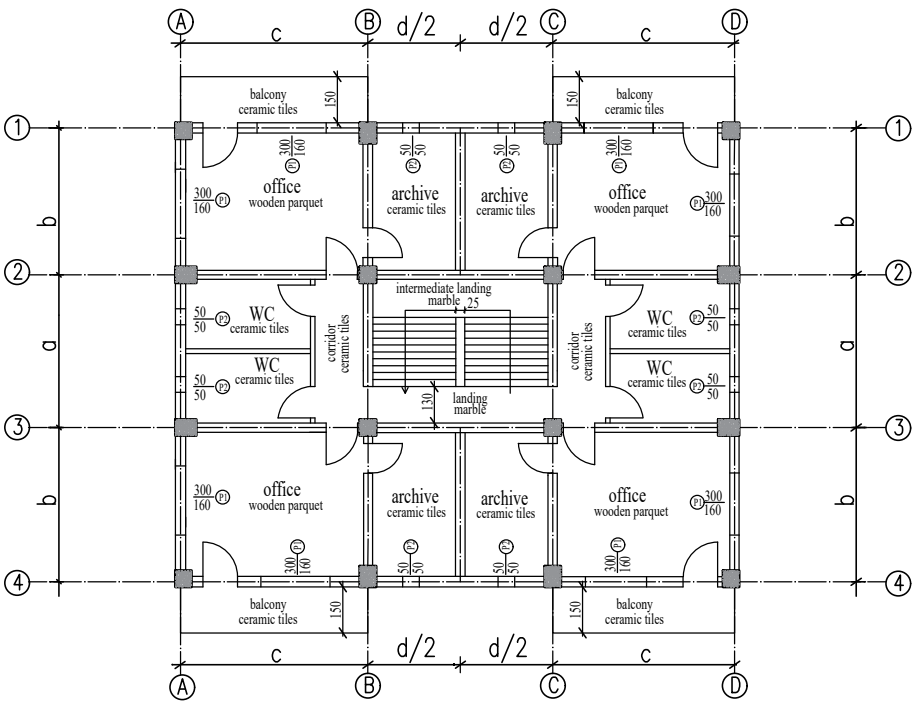
NOTES:

1-It is not allowed to use any software (Excel, Sap2000, Etabs, Sta4Cad, ProBina, IdeCad, softwares for calculations of uniaxial or biaxial combined bending, etc.) in any stage of calculations.

2-A written midterm exam and a written final exam will be held. The contributions of midterm and final exams are 40% and 40%, respectively. Besides, an oral exam will be held at project submission and its contribution is 20%.

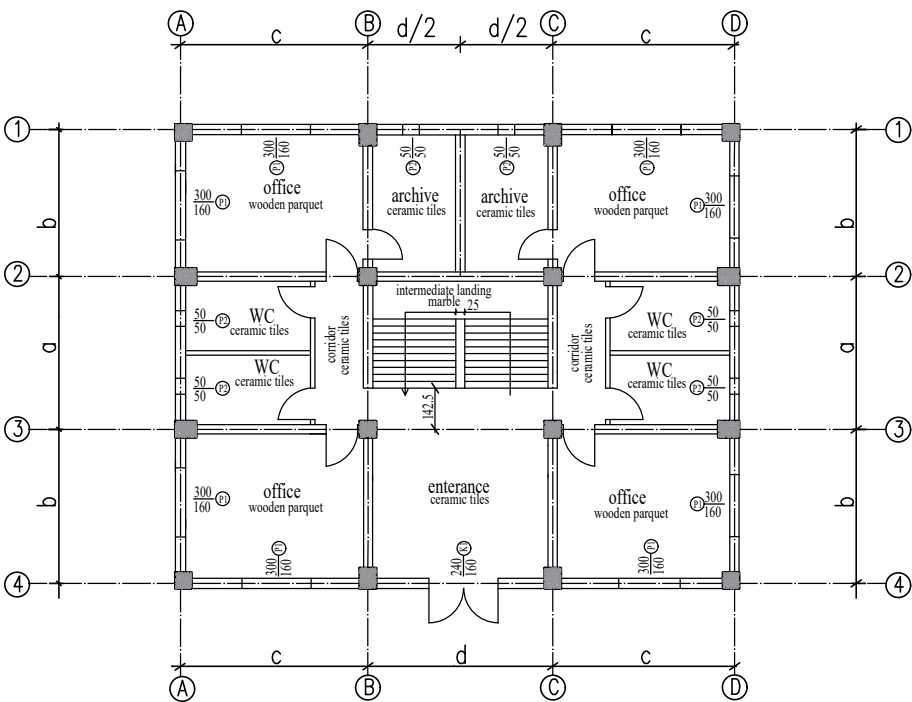
GOOD LUCK

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Normal Floor Plan

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Ground Floor Plan