Homework # 6

**Arch151 – STATICS**

Spring 2014-15

***Topics:*** Loads and load paths

***Textbook:*** Class notes

***Problems:*** You are required to the below problems:

(Problem-1)

The term ***live load*** is used to describe non-permanent load within a building – that is, those loads due to people and furniture. If a university classroom is 12 metres long and 10 metres wide and is designed to accommodate up to 60 students, calculate the live load in the classroom when full. (Note that you will have to make an assessment of the weight of an individual student, desk and chair.) Compare your answer with the British Standard value of live load (3.0 kN/m2) for classrooms.

(Problem-2)

An international hotel chain plans to upgrade its hotel in a particular glamorous and exotic location by installing a rooftop swimming pool on top of its existing high-rise bedroom block. The swimming pool will be 25 metres long and 10 metres wide and will vary uniformly in depth from 1 metre to 2 metres. Calculate the volume of water in the pool. If the unit weight of water is 10 kN/m3, calculate the weight of water in the pool, in tonnes. If a small modern car weighs 1 tonne, calculate the number of cars that would be equivalent, in weight, to the water in the proposed swimming pool.

(Problem-3)

For the structure shown in figure 1, the floor deck is a 25cms solid concrete slab spanning one way on the three steel beams shown. If the superimposed dead loads on the deck is 2.5kPa and the live load is 2.0kPa; it is required to:

1. Calculate the uniform load acting on each of the steel beam and find the reactions from these steel beams on the steel girder. Assume the self weight of the steel beam as 1 kN/m.
2. From the reactions of the steel beams in Part (a) above, find the reaction from this the steel girder on the steel column on either edge. Assume the self weight of the steel girder as 2 kN/m.



**Figure 1**

One way direction

3.00 m

2.50 m

6.00 m

***Given:*** Monday April 27, 2015

***Due:*** Wednesday, May 06, 2015