

CHAPTER 1

INTRODUCTION

1.1 Background

Airport is an area in the land and/or in the sea with the specific limitation that used as a place for aircraft landing and taking off, go up and go down the passengers, loading and discharging, and the movement place for intra and between modes of transportation, that is completed with safety and security of flight, and also basic facilities and other supporting facilities [1]. Meanwhile the most simple airport is at least has a runway but big airports are usually completed with many other facilities, both for flight service operator and for costumers. On the beginning era of the flight, airport was just a grass wide land that can be landed by aircraft from every direction depend on the wind. In the time of World War 1, Airport started built permanently as long as the increasing of the aircraft use and runway started seen like this time. After the war was ended, airport started to be added whit the commercial facilities to serve the passengers. Now, airport in not only place to go up an go down the aircraft. On its developing, several facilities are added such as stores, restaurant, etc.

An airport must have runway that use to take off and landing the aircraft. According to Horonjeff (1994) [2] *runway system in airport consists of pavement structure, shoulder, blast pad, runway and safety area*. The length of itself depends on aircraft which will use the temperature, the speed and the direction of wind, and also the air pressure around it.

The distance of airport must be far between one another, must be far from high buildings, and must be far from the mountains. Those conditions must be fulfilled for the safety of flight. Figure 1.1. shows the angel of take-off and landing.

When take-off half from difference 115% from the length of runway to reach the point of lifting that is 10,675 meter of height, while for landing the craft that is 60% from the distance of landing with the 15,25 meter of height.

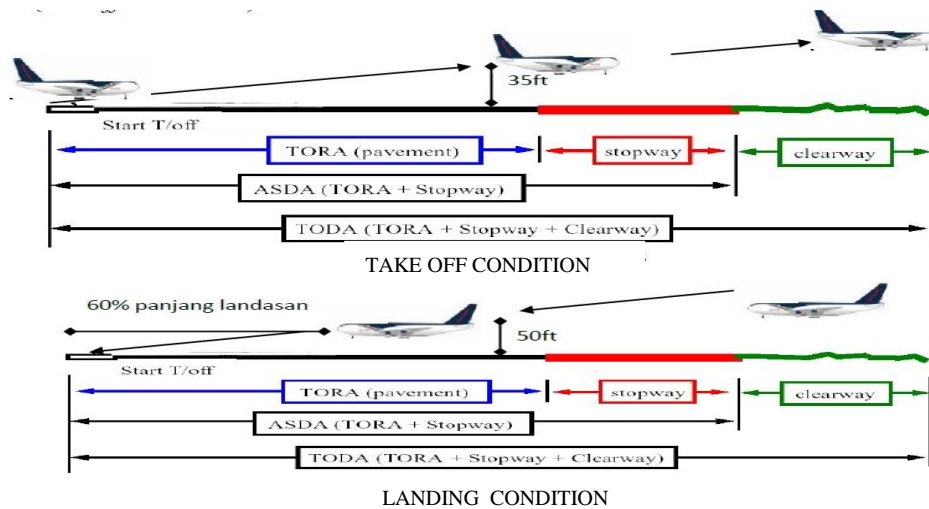


Figure 1.1. The angel of take off and landing of the aircraft [3]

To fulfill the condition of runway location, some airport or just it runway are built in the off shore. The famous airport and runway are built a part or whole in the off shore is Ngurah Rai International Airport in Bali Indonesia Figure 1.2. and Kansai International Airport in Japan Figure 1.3.



Figure 1.2. Ngurah Rai International Airport's [4]



Figure 1.3 Kansai International Airport [5]

There are two models on construction runway in offshore. The first models, that have been mostly used, is runway built over the dike constructed from the heap of tetrapods as shown in Figure 1.4.

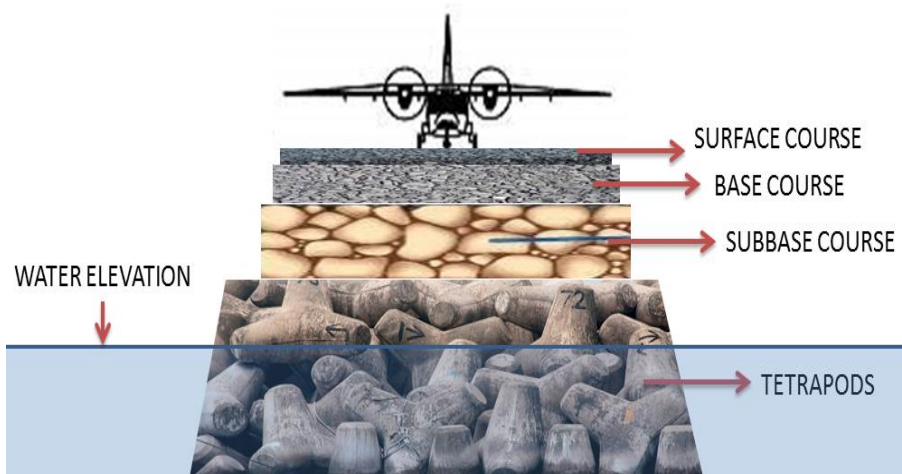


Figure 1.4. Runway over the dike made from the heap of tetrapods

The other model is called floating runway which will become a topic of this final assignment, is a very thick slab concrete is placed over group of piles as shown in Figure 1.5.

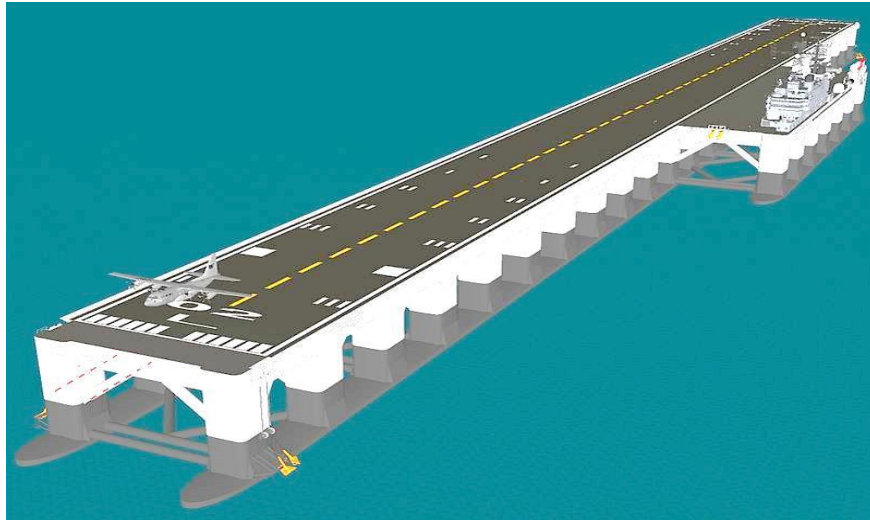


Figure 1.5. Floating runway [6]

1.2. Floating Runway

Floating runway, as shown in Figure 1.5 is the runway that whole part built in offshore. This construction of runway have not much been constructed in world at this time. The only one of floating runway which has been built is floating runway in Kansai International Airport in Japan as have been mentioned above. Shortly, it can be described that floating runway consists of piles, slab, with or without beam, and pile cap. Slab can be laid with asphalt, concrete. Detailed floating runway will be explained in Chapter 2 Literature Review. Design and calculation of floating runway will be conducted in this final assignment.

1.3. Problem Limitations

To design floating runway, some problem limitations must be taken into consideration, those are:

1. The depth of the sea will be limited to 30 meters from the surface sea level and maximum depth of hard soil layer is limited to 30 meters from the bottom of the sea.
2. The force that will be calculated are the sea wave, wind, and earthquake.

1.4. Objectives of the study

From the description above, the objectives of this study can be drawn as follows:

1. To design and calculate of the floating runway.
2. To get knowledge of design floating runway constructions in the offshore.

1.5. Scope of the study

To reach those objectives, this study starts with literature review that related with the floating runway design. All books, journals, papers related with floating runway will be reviewed in the chapter of literature review and then will be followed by the design and methodology. The design and calculation of the floating runway will be given in Chapter 4, the result and discussion will be given in the Chapter 5.