CHAPTER 2
SEISMIC ANALYSIS REQUIREMENTS OF BUILDINGS

2.1. PARAMETERS OF DESIGN RESPONSE SPECTRUM

2.1.1. Importance Factors

Depending on purpose of occupancy of building, *Building Importance Factors* (*I*) are defined as given in **Table 2.1**.

Table 2.1 – Building Importance Factors (*I*)

Purpose of Occupancy of Building	(*I*)
a) Buildings required to be utilised immediately after the earthquake (Hospitals, dispensaries, health wards, fire fighting buildings and facilities, PTT and other telecommunication facilities, transportation stations and terminals, power generation and distribution facilities, governorate, county and municipality administration buildings, first aid and emergency planning stations) **b)** Buildings containing or storing toxic, explosive and/or flammable materials, etc.	1.5
a) Schools, other educational buildings and facilities, dormitories and hostels, military barracks, prisons, etc. **b)** Museums	1.4
Sport facilities, cinema, theatre and concert halls, etc.	1.2
Buildings other than above-defined buildings. (Residential and office buildings, hotels, building-like industrial structures, etc.)	1.0

2.1.2. Seismic Load Reduction Factors

2.1.2.1 – *Elastic seismic loads* determined in terms of *spectral accelerations* defined in **1.2** shall be divided to below-defined *Seismic Load Reduction Factor* to account for the ductile behaviour of the structural system during earthquake. Period-dependent *Seismic Load Reduction Factor*, $q_R(T)$, shall be determined by **Eqs.(2.1)** in terms of *Behaviour Factor*, *q*, representing the ductility capacity of the structure and the *Building Importance Factor*, *I*, indicating the performance objective of the building.

$$q_R(T) = 1 + \left(\frac{q}{I} - 1\right)\frac{T}{T_S} \qquad (0 \le T \le T_S)$$
$$q_R(T) = \frac{q}{I} \qquad\qquad (T_S < T)$$

(2.1)

where (*q*/*I*) ratio shall not be taken less than unity.