

EARTHQUAKE

& SAFETY MEASURES

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INTRODUCTION

The current presentation was composed during the writer's internship in E.P.P.O under the supervision of Dr Asimina Kourou. Its goal is to give sufficient and accurate information about earthquake safety measures to the staff working in embassies and consulates or to any other foreigners that work in Greece.

GREECE & EARTHQUAKE

The necessity of the knowledge of earthquake safety measures is widely acknowledged, given that Greece is a mostly seismic country. Populations living in countries where the seismic activity is insignificant aren't usually acquainted with the essential safety measures.

However, working or visiting Greece means that you might experience an earthquake. Therefore, adequate readiness is the key to well calibrated actions and efficient precautions.

SEISMIC CODE

The history of the development of the Greek regulations system.

1959

The first Greek Seismic Code (E.A.K.) was drafted

1984

E.A.K. was supplemented with additional articles, the exclusive application of which started in 1985.

1995

The New Greek Seismic Code (N.E.A.K.) was established and put into force and since 2000 the main regulations that are enforced is E.A.K. – 2000.




2000

Since then multiple amendments and supplementations occurred, and clarifications added wherever was needed.

...the New
...Seismic Hazard
...included in
...K.-2000. In that
...three seismic
...are depicted,
...while in its older
...version there were 4
...zones.



The adjacent image depicts Greece divided in three seismic zones (blue, green and red).

-  Blue regions is the one the least seismically active
-  Green regions are of medium activity
-  Red regions are the most active in terms of earthquake

EUROCODES

European Union has made great steps in delivering regulations on earthquake. Its regulations ought to be implemented by every member state.

Eurocodes and Greece

While Greece is an active member of the European Community her adherence to European legislation and regulations is exemplary.

Establishment of Eurocodes in Greece

Hence in 1995, the Eurocode Commission, which appertains to the Ministry of Environment, established the Eurocodes. That Commission supervised the strict implementation of the Eurocodes throughout the country. Its mission was accomplished by 2009 when all Eurocodes were fully incorporated in the Greek legislative system.

Eurocodes and Greek Regulations

Since the Eurocodes' incorporation in the Greek legal system, Eurocodes have been enacted simultaneously with the Greek anti-seismic regulations.



EUROCODE 8 (EN 1998)

Eurocode 8 is also known as Design of structures for earthquake resistance (EN 1998). Its regulations are extended to all kinds of constructions.

Eurocode 8 makes very wise distinction between the various constructions, regarding their earthquake resistance needs. In particular, there are 4 categories of buildings according to the earthquake-resistance they need. These four categories are detailed in the following slide.

GREEK REGULATIONS & EUROCODE 8

Since 2014 Eurocode 8 has been in simultaneous use with E.A.K. – 2000. Thus, the general form of the Eurocode is harmonically combined with the special and specific precautions taken for the seismic prone Greek regions.

BUILDING CATEGORIES ACCORDING TO EUROCODE 8

CATEGORY 01

Warehouses and production units are considered to need the least earthquake resistance and hence they appertain to the lowest category



CATEGORY 02

Houses, apartment buildings, hotels, common constructions and embassies



CATEGORY 03

Schools, because of their use, need very careful reinforcement.



CATEGORY 04

Hospitals, fire stations and big museums make the highest category while their endurance during an earthquake is of uppermost importance.

WHAT IS EARTHQUAKE ?

Earthquake is a natural phenomenon that no any current mechanism or scientific equipment can absolutely predict in long-term basis. This sudden break out is that provokes the most terror to humans and societies.

E

ARTHQUAKE & HUMANS

Earthquakes occur when a huge amount of energy stored in Earth's crust finally is released. All this has a great impact on people's lives, on civil order and on constructions.

DANGER ?

But are earthquakes really deadly? Engineers say: "No! Earthquakes do not kill people. Buildings do."

HOW ?

How does Earthquake affect Buildings ?

A building will likely endure an earthquake strike since it is earthquake-resistant, or it will collapse if it is deficiently reinforced. The construction of earthquake-resistant buildings depends on many different factors.

FACTORS

There is a wide range of social, economic and legislative factors that affect the construction of earthquake resistant buildings.

Legislation and its implementation

Region's Seismic historic and local geology

Engineers' adequacy

Standard of living

The additional cost due to earthquake proof construction

All these features above demonstrate the diligent construction of infrastructure in Greece. Greek engineers obey all the seismic regulations, and as a result most buildings can endure an excessive concussion.

PREPAREDNESS
&
SAFETY

EMERGENCY PLAN



RISK
ASSESSMENT



CONTACT
DETAILS

1

Risk Assessment

2

Definition of Emergency groups

3

Escape Walkways and evacuation process

4

Registration of contact details

5

Definition of Emergency groups

6

Providing emergency supplies

7

Synergy for common Planning with co-located businesses



RISK ASSESSMENT

STRUCTURAL
HAZARDS

&

NON -STRUCTURAL
HAZARDS

RISK ASSESMENT

In spite of the precautions that may be taken for a possible seismic event there are some risks that may exist in the very working place. These said risks are distinguished in two main categories:

- Structural vulnerability
- Non structural vulnerability

BUILDING

STRUCTURAL ELEMENTS

Pillars, beams,
walls, concrete
platforms,
handrails, windows,
etc.

NON-STRUCTURAL ELEMENTS

Furniture, paintings,
lamps, bookshelves,
ornaments, etc.



- Place all heavy or fragile items on low shelves
- Properly fixing shelves, paintings and mirrors



- Properly fixing of heavy furniture, bookshelves and wardrobes on the wall
- Avoid hanging heavy items above the desk or the sofa
- Remove all high and heavy furniture from the doorways and passages because they can capsize and block the exit routes
- Properly fixing of all lights and ceiling fans



Have a first aid kit to an approachable place



Non-structural Hazard Prevention



Click on the images to learn more about non-structural hazard prevention



EMERGENCY PHONE NUMBERS



112

Emergency
European
Call Number



**100
1571**

Hellenic
Police
&
Tourist
Police



199

Fire
Service



166

National
Emergency
Aid Centre



INFORMATION ON EARTHQUAKE PLANNING

Topics

Employer & employees

Drills & preparation

Results & review

Employees' Information on Earthquake Planning



Responsibility

The employer has absolute responsibility to properly inform the staff on the working space's earthquake planning.



Development

The whole information process is not done once, but is a lasting procedure that requires adjustment to new data or instructions.



Employees

Employees are obliged to attend seminars or other educational programs on emergency planning conducted by the employer.

Staff Briefing Issues

The proper staff briefing must be sufficient and crystal clear and should cover the following:

1

Self-protection measures

2

The Workplace Emergency Plan

3

Basic First Aid

4

Fire extinguishing systems, master switches of electric current, water or natural gas

5

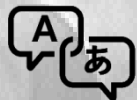
Warning Systems

6

The support procedure for individuals with disabilities during the evacuation of the building

7

The guidance procedure for people who do not speak Greek and/or for the visitors etc. after an earthquake



IMPORTANCE

01

OPTIMIZATION

Emergency Plan might demonstrate some omissions or problems if put into action. In order to ascertain these problems before a seismic event, it is essential that earthquake drills are conducted.

02

FAMILIARITY

The workers will get familiar with all protection instructions and acquire necessary readiness skills. Also their attitude and behavior will gradually get improved in order to avoid the confusion and panic in case of an earthquake.

PREPERATION OF THE DRILL

Before the implementation of the drill there are 3 major issues that have to be specified

The aim of the drill

The scenario of the drill

The expected results

1

2

3

Workers' participation in the drill

In order to improve the worker's readiness, the drills must cover a wide variety of scenarios. For instance, a scenario would be a drill about night shift.

Before the starting of the drill, the employer must inform the workers about the followings:

1

The drill scenario



2

Each worker's part



3

The characteristic sound with which the drill will start



4

The assembly area



DRILL PROCESS

During the drill, there has to present an “evaluator” to evaluate the entire process. The evaluator’s duty will be to record:

- the problems that may occur
- the good and the bad practices that were followed

Hence, through the evaluation the evaluator will be able to submit propositions for the Emergency Plan’s update.

Also, during the drill, “observers” may participate in the process. Observers are individuals that attend the entire drill process, without taking part in it.

AFTER THE DRILL

After the completion of the drill, its evaluation is put into effect which goal is to demonstrate the strengths but mostly the weaknesses and the reasons they exist.

The evaluation of the drill may take place in multiple occasions.

EVALUATION OF THE DRILL

1

During a work meeting between the Employer and the Safety Technician etc.



2

By organizing a meeting with the Employer, the Safety Technician and the employees in order to exchange opinions related to the exercise's implementation, any bad or good practices etc., and taking into account the comments of the "Evaluators".



3

By the distribution of questionnaires to all participants.



Emergency Plan's Review

Workplace's
Emergency Plan
should be revised or
updated when

1

It is deemed that it will not be effective in case of an earthquake emergency



2

Important changes have been made in the operating procedures or/and the workplace equipment.



3

The staff has changed

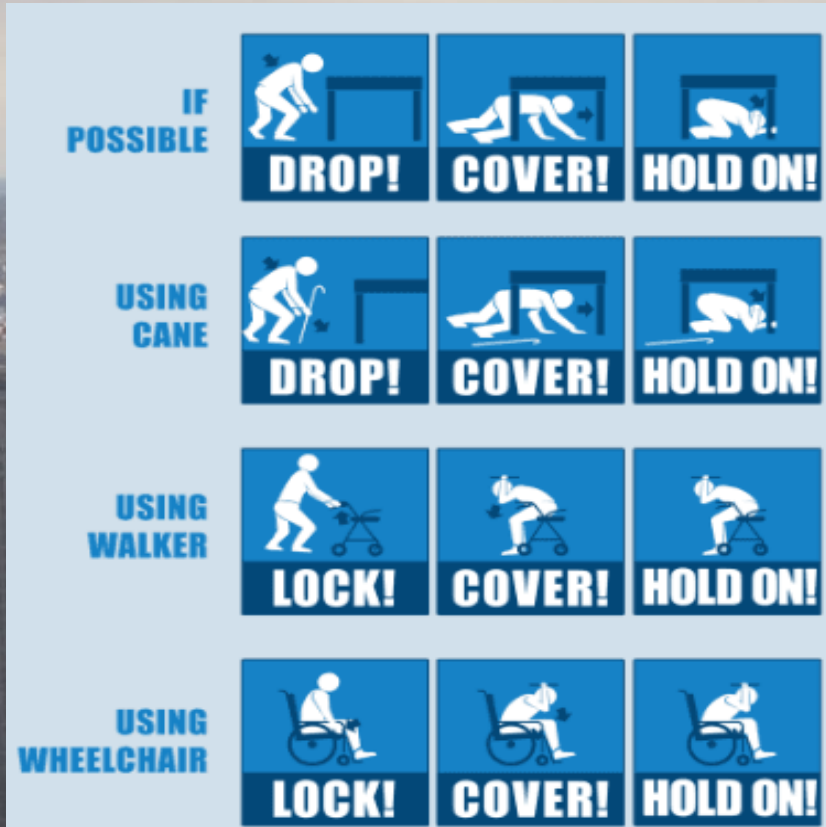


4

The protection instructions have changed



EARTHQUAKE SAFETY



TO SUMMARIZE

Earthquake is a sudden and devastating natural phenomenon with a disastrous impact on human societies.

Arbitrary and panic are expected but not wise reactions. Earthquake safety requires self-composure, vigilance and providence.

It requires a detailed and deliberate plan that accommodates the needs of all people before, during and after the earthquake.

In a merely earthquake-prone country as Greece, the knowledge of safety measures is of uppermost importance and priority.

It is our duty to learn more about earthquake safety instructions and refute any myths that happen to serve as instructions.



**PREVENTION
IS BETTER THAN
CURE**

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Thank
You