



MINISTRY OF INFRASTRUCTURE TRANSPORTATION AND NETWORKS  
GENERAL SECRETARIAT OF INFRASTRUCTURE  
DIRECTORATE – GENERAL OF TECHNICAL SUPPORT  
NATURAL DISASTER'S REHABILITATION DIRECTORATE  
(DAEFK)

# DAEFK

## EARTHQUAKE RESPONSE PLANS & SHELTERS IN GREECE

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**PACES**

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Scenario Workshop



## **Competent Authority of Greek State for the Assessment and Rehabilitation of Affected Areas, after Earthquakes ( or other Natural Disaster)**



# DAEFK natural disaster events (1981 -2016)

earthquakes	77
landslides	51
wild fires	78
floods	176
hail storms	1
tornado	3
total	386



# D A E F K: main responsibilities

- ✓ **Buildings Damage Assessment**
- ✓ **Measures for Temporary Shelters and Rent Subsidy**
- ✓ **Measures for the relief of society and Rehabilitation of Damaged Area**



### ◆ Usual promptitude

Emergency Situation

### ◆ mobilization

Immediate  
actions

Post- earthquake  
examination of  
buildings

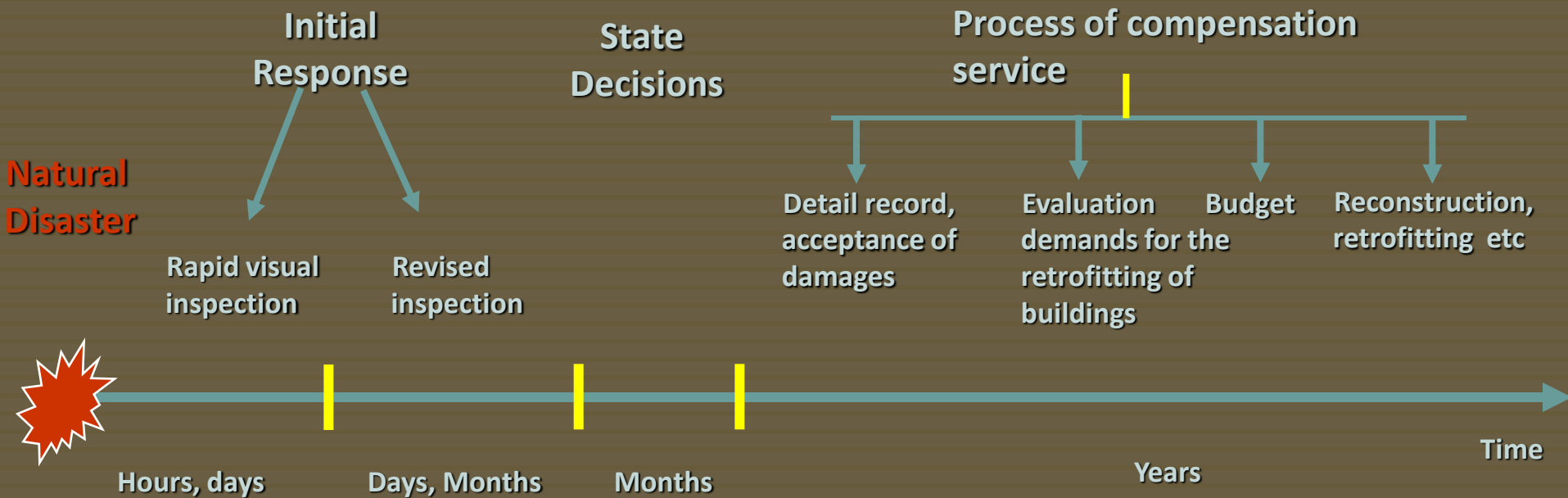


# DAEFK main activities after an earthquake

- ◆ Safety Assessment of Buildings and Infrastructures
- ◆ Supervision of Immediate Propping of Damaged Structures, demolition of dangerous buildings
- ◆ Concise definition of damaged area
- ◆ Implementation and supervision of rehabilitation programs
- ◆ Temporary Shelters
- ◆ Monitoring of Construction Methods and Procedures
- ◆ Issue of repair permission and financial support approval
- ◆ Supervision of the design and repair of damaged infrastructures



# General diagram of actions





# Temporary Housing

Local authorities

## Emergency Housing

- ✓ Almost immediately after the disaster
- ✓ Duration from the first night up to several days or weeks
- ✓ Tents, ships, cars, hotels, houses of relatives

DAEFK

## Temporary Housing

- ✓ Prefabricated houses (container)
- ✓ Rent Subsidy



# DAEFK Programs of Temporary Housing

DAEFK in order to give a solution to the problem of displaced people, after a physical disaster is authorized either to :

- ✓ Provide and Install prefabricated houses, in appropriate areas, or close to the damaged house .
- ✓ Give financial aid, for 2 years, for the rental of an apartment as temporary residence, until the repair or the reconstruction of the damaged one



# Entitlement

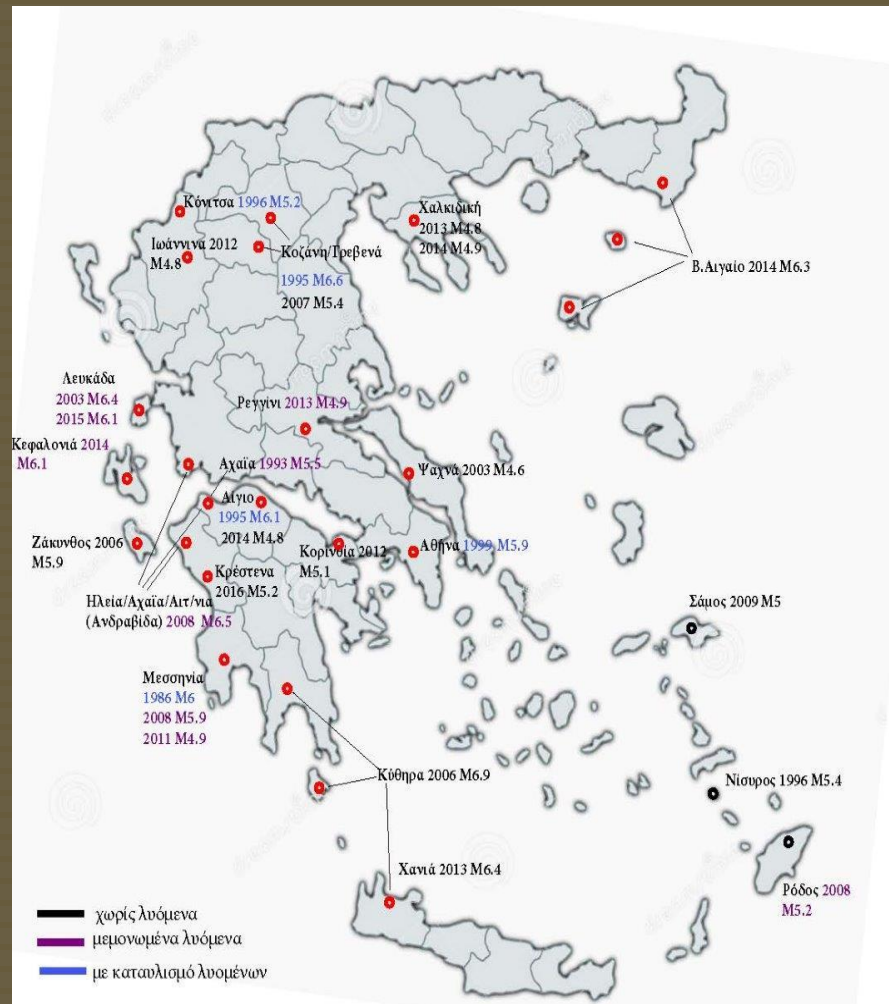
- People whose houses were marked as yellow or red after the Revised inspection
- They don't own other house in the area
- They don't get financial aid to rent a house
- The damaged house was used as permanent residence

## Documents needed

People living in prefabricated houses in camps, have also free water and electrical supply



# DAEFK Activities – Temporary Housing





# Campsites

## □ Requirements:

1. Local Authorities suggest the prescheduled areas
2. Requisition of private land or use of public land
3. Construction of Infrastructure
4. Provision of Prefabricated Houses
5. Establishment of Houses

*In case of Physical Disasters, special Legal status makes procedures easier, in order to realize the project as soon as possible*



# Infrastructure

- ✓ Spatial Planning
- ✓ Terrain modulation Planning

- ✓ Terrain modulation
- ✓ Construction of infrastructure networks and bearing beams
- ✓ Construction of technical works
- ✓ Set houses on beams
- ✓ Connect with networks

It is estimated that the cost for the construction of the camp  
is 25% x cost of container x number of containers



# Modular (Prefabricated) houses

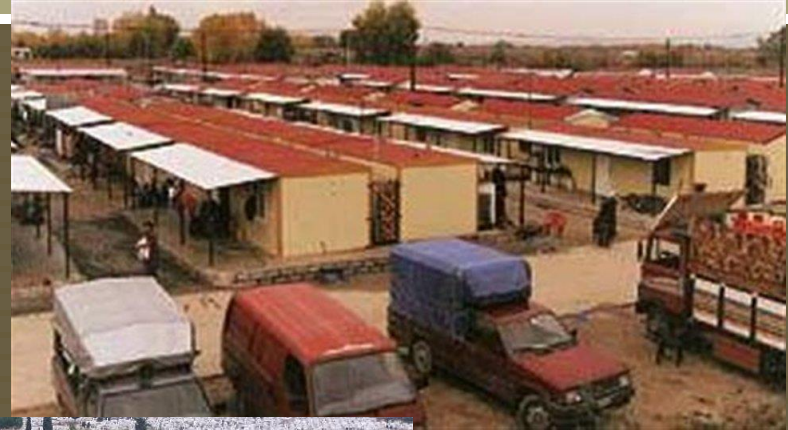
- **Main Body** consisted of **galvanized metal sections**, hot rolled steel sections, min thickness of 2.5 mm.
- **Bearing structure** consisted of columns, beams, joists, rafters, etc, with a clear static function
- **Walls** constructed by flat or slightly forming self-supporting polyurethane **panels**, min thickness of 50mm and width of 1,00 up to 1.25 m
- **Floor** with: **steel sheet** (Plate) galvanized, 0,5 mm thick, **thermal insulation**, (expanded polyurethane) thickness 50 mm, upper part from **top quality marine plywood sheets** (18 mm) and final surface with **plastic roll slip vinyl**, min 1.3 mm thickness.

loading and unloading of a house with the crane and attachment for vehicles carrying up to local transport with a forklift truck



# DAEFK Activities – Temporary Housing

Settlement of prefabricated houses at Kalamata after the 1986 earthquake of M6.0  
4,500 houses



Settlement of prefabricated houses at Aigio after the 1995 earthquake of M6.1  
200 houses



Settlement of prefabricated houses in Athens after the 1999 earthquake of M5.9  
5,700 houses





# Conclusion

- Camps are necessary when there aren't any houses available to rent, after a severe earthquake.
  - Houses can be reused after repairing
- BUT:**
- It is difficult to evacuate the camps, as at the end, people with social needs occupy them without any authority
  - Infrastructure is expensive
  - People prefer to have a prefabricated house close to their property

- Cost of prefabricated house  $9.650 \times 1,25 + 1.000 = 13.000$
- Cost for renting  $350 \times 24 = 8.400$





# DAEFK



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# Sleeping in a car



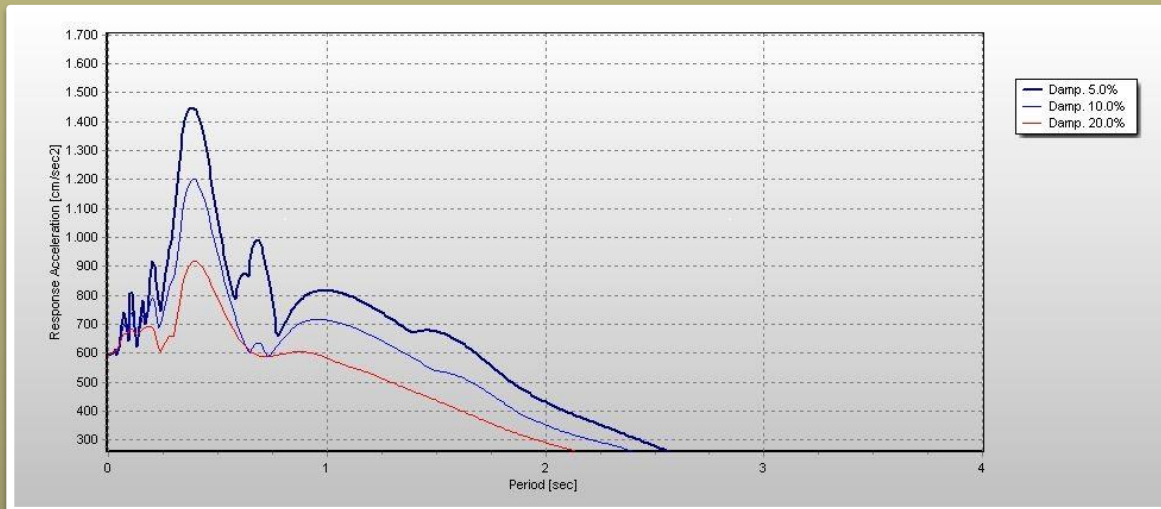


# Usual Preparedness

- ◆ Lists with necessary telephone numbers of :
  - ✓ employees
  - ✓ affiliation with Civil Protection
  - ✓ Mayors, Chiefs of Regions
- ◆ Emergency team
- ◆ Provision of necessary equipment ( helmets, vests, hammers, chisels, tape measures, autopsy forms)
- ◆ Updated electronic files



# Emergency Situation



*Director of DAEFK is informed from OASP by a telephone message, for the earthquake, the region where it took place and its intensity*



# Mobilization- action plan performance

- DAEFK's emergency team, takes action, in any case, 24/7
- Selection of information from local authorities and
- mobilization of human resources and equipment
- engineers of D.A.E.F.K. travel, by all means of transport, to the affected area in order to examine damaged buildings
- an office is built up, in the affected area, to support the buildings inspections and accomplish the supporting program



# DAEFK Activities

PREFECTURE.....  
DEPARTMENT.....

Number of inspection form.....  
Number of inspection team : T.....

## FORM FOR A FIRST DEGREE RAPID USABILITY EVALUATION

### A. BUILDING INFORMATION (IDENTIFICATION)

Address.....  
Municipality/Community.....  
Owner.....  
Building manager.....

Police Department.....  
Phone Number.....  
Phone Number.....

### B. BUILDING DESCRIPTION

Number of stories  Number of residential units  Year of construction

#### Occupancy

☐ Residential ☐ Parking ☐ Public Services ☐ Industrial  
☐ Commercial ☐ School ☐ Church ☐ Agricultural Building  
☐ Offices ☐ Hotel ☐ Storage ☐ Other.....

#### Type of Structure

☐ Reinforced concrete structure  
☐ Masonry bearing walls and floors made of reinforced concrete or steel or wood  
☐ Mixed system (both R.C. and masonry vertical members)  
☐ Other

Soft story ☐ Yes ☐ No  
Stories below ground ☐ Yes ☐ No  
The building is in use ☐ Yes ☐ No

### C. BUILDING USABILITY CLASSIFICATION

Inspection from outside ☐  
Inspection from both outside and inside ☐

Usable  
(posted in green)

Occupancy permitted

Temporarily unusable  
(posted in yellow)

The building should not be used on a continuous basis until a more detailed evaluation will be performed during a second degree inspection. All necessary safety measures should be taken immediately.

Unusable/Dangerous  
(posted in red)

Imminent danger of sudden collapse. Entry is absolutely prohibited. All necessary safety measures should be taken immediately. A more detailed evaluation of this building will be performed from structural engineers during a second degree inspection.

The evaluation applies to: all the building ☐  
parts of the building ☐ Number of homeless households

### D. SAFETY MEASURES

Barricades needed in the following areas .....  
The ☐ electricity ☐ water ☐ gas utilities of should be disconnected.  
Immediate supporting of this building is required.....  
The following elements should be demolished or removed.....

### E. COMMENTS.

Date..... Time.....

#### THE INSPECTORS

1. Signature .....  
Name .....  
Affiliation .....

2. Signature .....  
Name .....  
Affiliation .....

A COPY OF THE FORM WAS HANDLED IN TO:

Owner ☐  
Building Manager ☐  
Other.....

Signature .....  
Name.....



Safety assessment of buildings and infrastructures damaged after a natural disaster.





# DAEFK – Anti dangerous measures, demolitions

**DAEFK can supervise as a public project or consult local authorities (considering the size of the work that have to be accomplished), in order to be taken immediate and urgent anti - danger measures (demolition of dangerous buildings and elements).**

**Demolition of an unstable and dangerous building – Grevena, Kozani 1995.**



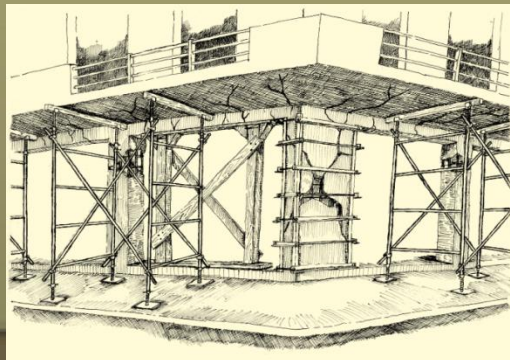
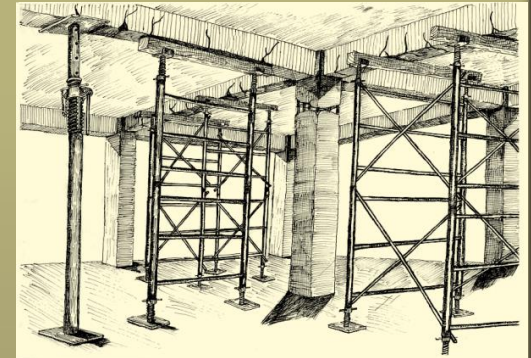
**Night operation for demolishing dangerous elements from buildings – Kalamata 1986.**





# DAEFK Activities

## Supervision of immediate propping of damaged structures.





# DAEFK Activities

Supervision of Hazard elimination measures, demolition of dangerous buildings and elements.





# DAEFK Activities

- Prefabricated houses





# Quick damage inspections

**A rapidly evaluation of the damage situation  
and conclusion for the damage state of the building.**

**Purpose: to identify which buildings are safe  
performed within a restricted short period of time**

**Results:**



Suitable for use, habitable

Revised inspection

Unsuitable for use,  
uninhabitable



# Revised inspection

Detailed inspection of the structural elements and conclusion for the damage state of the building.

Purpose: To distinguish the buildings into three categories.

## Results:



Suitable for use, Green mark ( x )

Unsuitable for use until the building will be repaired, Yellow mark ( x )

The building is possible to collapse, the entrance is forbidden, protocol of dangerous and creaky building, demolition, Red mark(x)



# DAEFK Activities



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ  
ΥΠΟΥΡΓΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ,  
ΧΩΡΟΤΑΞΙΑΣ ΚΑΙ ΔΗΜ. ΕΡΓΩΝ  
ΓΕΝΙΚΗ ΓΡΑΜ. ΔΗΜ. ΕΡΓΩΝ  
ΥΠΗΡΕΣΙΑ ΑΠΟΚΑΤΑΣΤΑΣΗΣ  
ΣΕΙΣΜΟΠΛΗΚΤΩΝ (Υ.Δ.Σ.)

Αθήνα, 9 Ιουλίου 2008

Αρ. Πρωτ.: οικ. 5371 / Β11

Τμήμα: Αποκατάσταση Σημάτων (β)  
Τεχ. Δ/ση: Κεντρική 43 & Α. Κατόνη  
Τεχ. Κώδ.: 114 71 ΑΘΗΝΑ  
Πληροφορίες: Ε. Σαλιδάκη  
Τηλέφωνο: 210 54 65 831  
FAX: 210 54 65 837

## ΑΠΟΦΑΣΗ

**Θ Ε Μ Α :** Καθορισμός ελαχίστων υποχρεωτικών απαιτήσεων για τη σύνταξη μελετών αποκατάστασης και την έκδοση των σχετικών οικοδομικών αδειών επικοπής / ενίσχυσης των κτιρίων που έχουν υποστεί βλάβες από το σεισμό της 8ης Ιουλίου 2008 σε περιοχή του Νομού Αργολίδας, Ηλείας και Αιτωλοακαρνανίας.

## Ο ΥΠΟΥΡΓΟΣ ΠΕΡΙΒΑΛΛΟΝΤΟΣ ΧΩΡΟΤΑΞΙΑΣ ΚΑΙ ΔΗΜΟΣΙΩΝ ΕΡΓΩΝ

Έχοντας υπόψη:

1. Τις διατάξεις του άρθρου 2, παρ.2 και του άρθρου 3 της από 26.7.1978 Πρωτοκόλλου του Πρυθάνου της Δημοκρατίας: «Περί αποκατάστασης 1978 της περιοχής Ιωαννίνων Ελλάδος και των ρυθμίσεως στέγων των κτιρίων, προσαυξημένα και συμπληρωμένα με το Ν.867/79 (Φ.Ε.Κ. 2)».
2. Τις διατάξεις του Ν.1190/81 (Φ.Ε.Κ. 293/Δ/30.7.81) ο οποίος ισχύει ως Νόμοι του Πρωτοκόλλου της Δημοκρατίας: «Περί των σεισμών 1981 και ρυθμίσεως στέγων σπανίων κτιρίων» όπως συμπληρώθηκε με το άρθρο 1, παρ.42 και 43 του Ν.2412/96 «Διαταγή Υπουργού υπαχθόντων επί 2222 Κυβερνητική άρρση και άλλες διατάξεις».
3. Τις διατάξεις του άρθρου 3, παρ.3, τέταρτο α εδάφιο του Ν.1266/92 (Φ.Ε.Κ. 293/Δ/30.7.92) ο οποίος ισχύει ως Νόμος της Δημοκρατίας: «Περί των σεισμών 1981 και ρυθμίσεως στέγων σπανίων κτιρίων» όπως συμπληρώθηκε με το άρθρο 25, παρ.6 του Ν.1418/93 «Περί ρυθμίσεως άλλων σπανίων κτιρίων» (Φ.Ε.Κ. 23/Α).
4. Τις διατάξεις του Ν.128/75 «Περί προστασίας και σμολογιστικών ενισχυσεων σε της 41 κτιρίων και δημοδομικών οδοτήσεων».
5. Το Γ.Α. 69/1988 περί Οργάνωσής της Γ.Γ.Ε. του Υ.Π.Χ.Δ.Α.Ε.

## ΕΦΗΜΕΡΙΣ ΤΗΣ ΚΥΒΕΡ ΤΗΣ ΕΛΛΗΝΙΚΗΣ ΔΗΜΟΚΡΑΤΙΑΣ

Cooperation with Minister, covering various aspects, such as setting the limits of the damaged area, taking rehabilitation measures (financial state aid, building terms and conditions), issuing technical instructions, evaluating recovery cost, etc.



# DAEFK Activities

Implementation and supervision of rehabilitation programs.





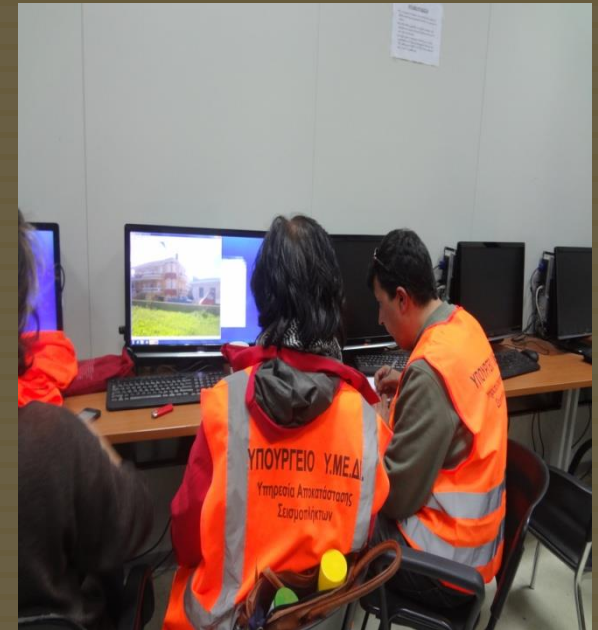
# DAEFK Activities

Supervision of the design and repair of damaged infrastructures.





# Engineers in act





# To Limnos by helicopter









# Documents needed

Of the owner and the members of its family

1. Revised Inspection
2. Fiscal documents
  - ✓ tax declaration
  - ✓ declaration of property



# Kalamata's camp





# tents





# Transportation





# Athens camps





# Tents in Grevena





# Living in a boat





# Tents in Grevena





# Grevena





# Athens camp





# Athens camp





# Athens camps





Response	Percentage
Yes, the U.S. should take action to reduce global warming	90%
No, the U.S. should not take action to reduce global warming	10%





# Athens camps





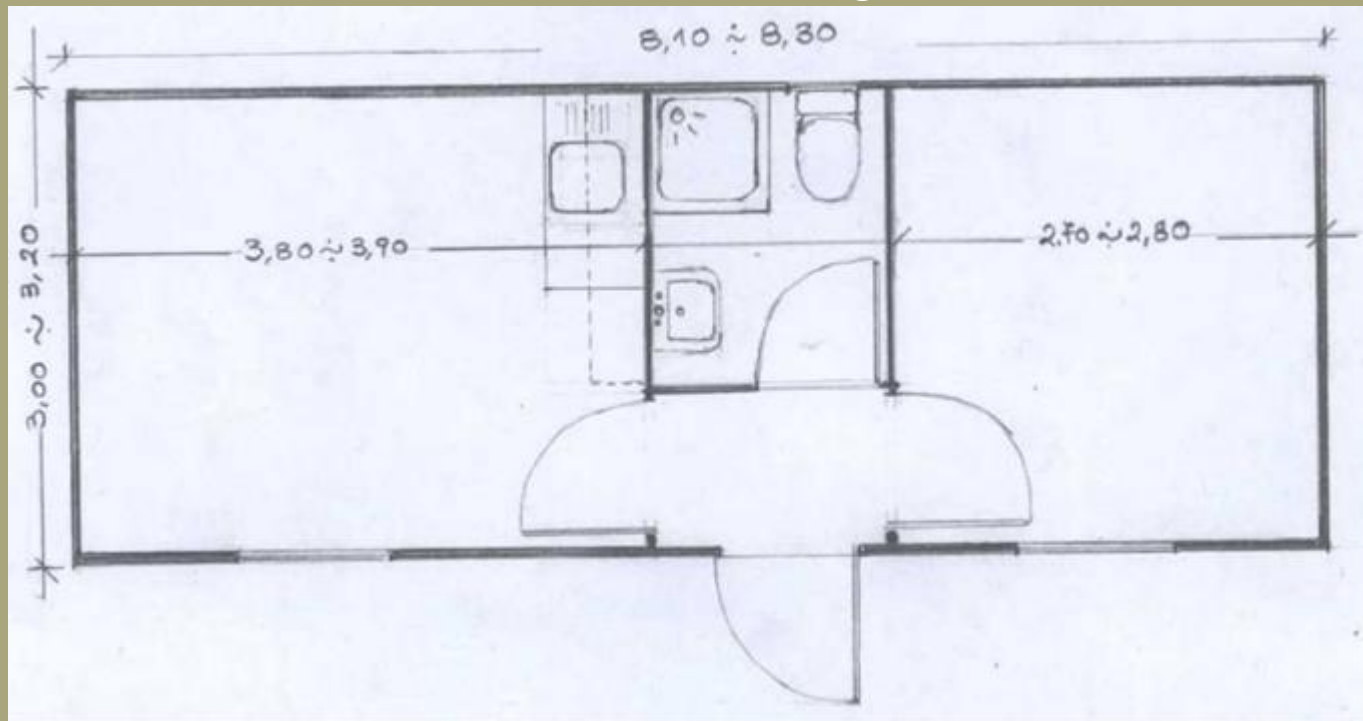
# House of 25 m<sup>2</sup>

Length: 8,10-8,30m

Width: 3,00-3,20m

min inside height: 2,30m

max outside height 3,00m





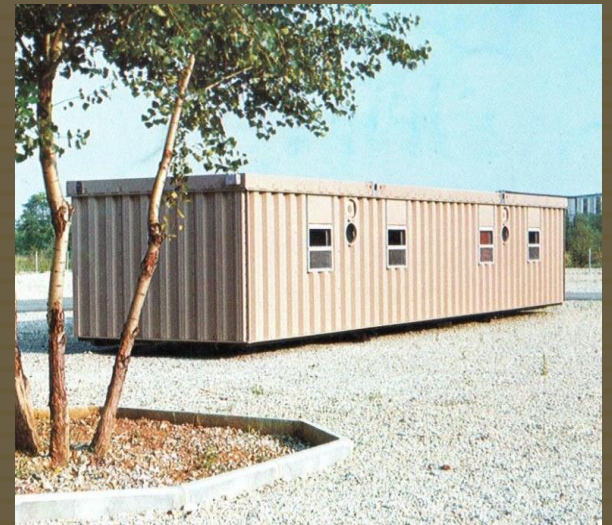
# Olympic Games

Settlement of prefabricated houses in Amygdaleza, Attica lodging security personnel during the Olympic Games of 2004.





# Kalamata





# Kozani- Grevena

- The State built new houses for the earthquake stricken





# Athens camps





# Life in the “house”





# Athens camps



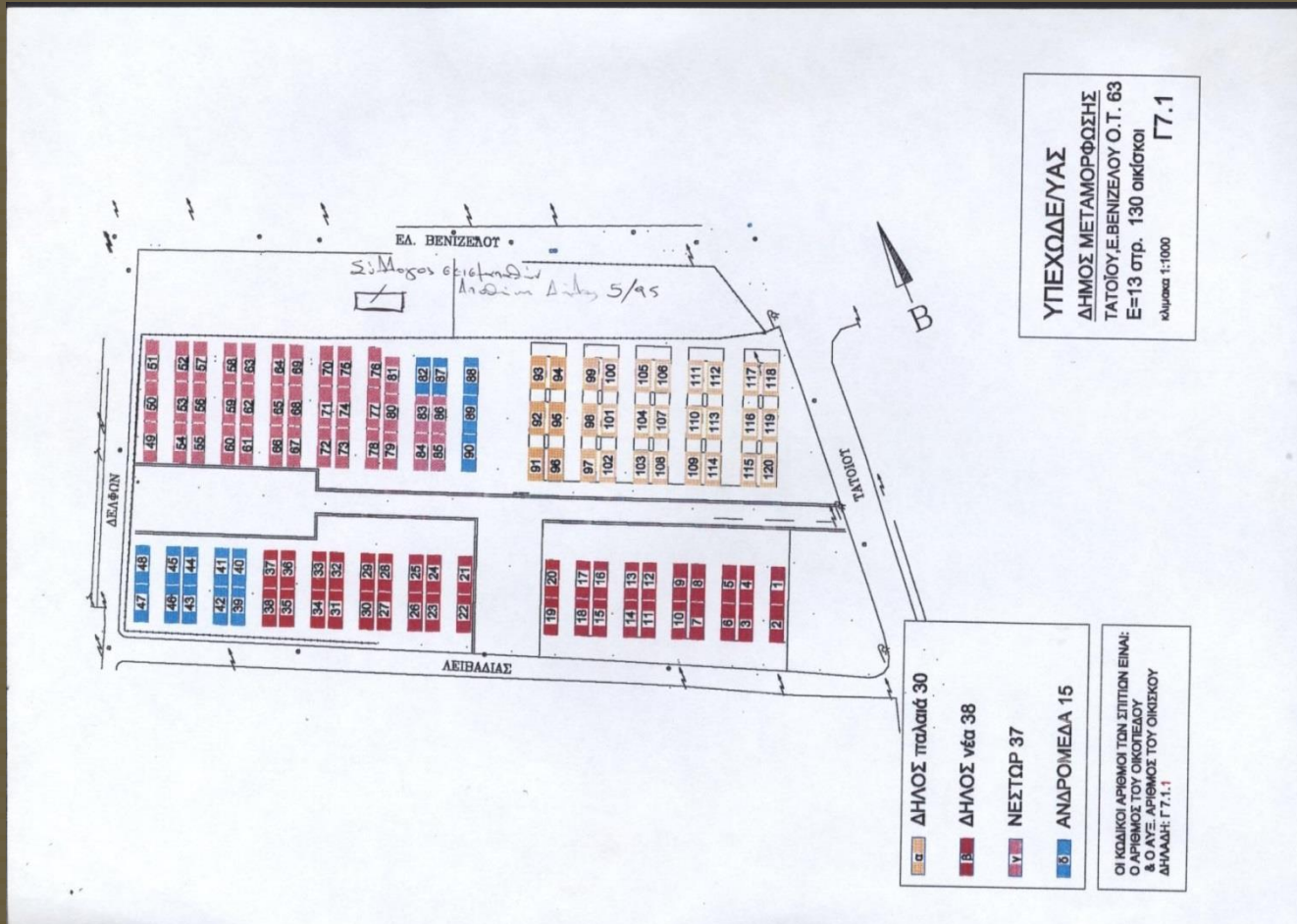


# Athens camps





# Athens camps





# Athens camps









# Axion esti 1999 and today









# DAEFK Activities – Temporary Housing

**Also**

ROM  
1500

Italy  
(1998)  
15

Colombia  
(1999)  
10

Olympic  
Games  
2004

Turkey  
(1999)  
150

Albania  
(1999)  
200

**REFUGEES**  
650



# Camps for Rom





# Camp in Turkey



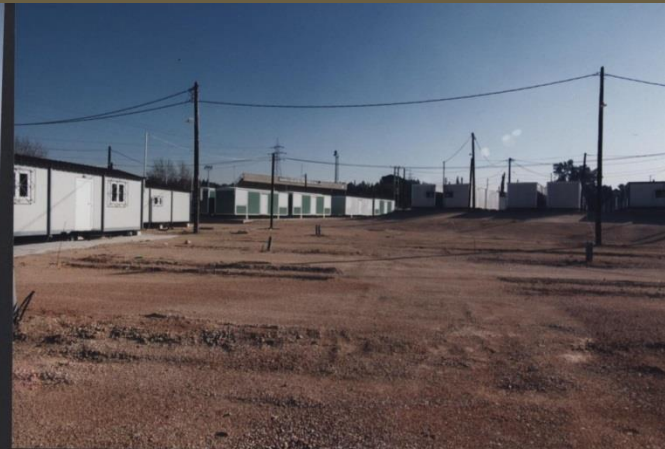


# Container Storage in Aspropyrgos





# Athens camps - infrastructure





# To repair

