



Italian Joint Reconnaissance Mission

Türkiye

May 8th – 13th 2023

In collaboration with:

TED
ÜNİVERSİTESİ



ODTÜ
METU



Daily Report
May 11th 2023

Under the auspices of the
Italian Department of Civil Protection



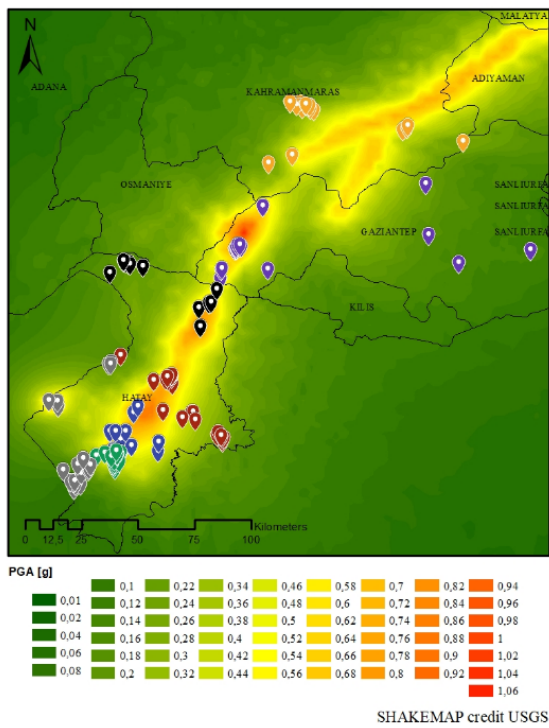
PROTEZIONE CIVILE
Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

Daily report, May 11th

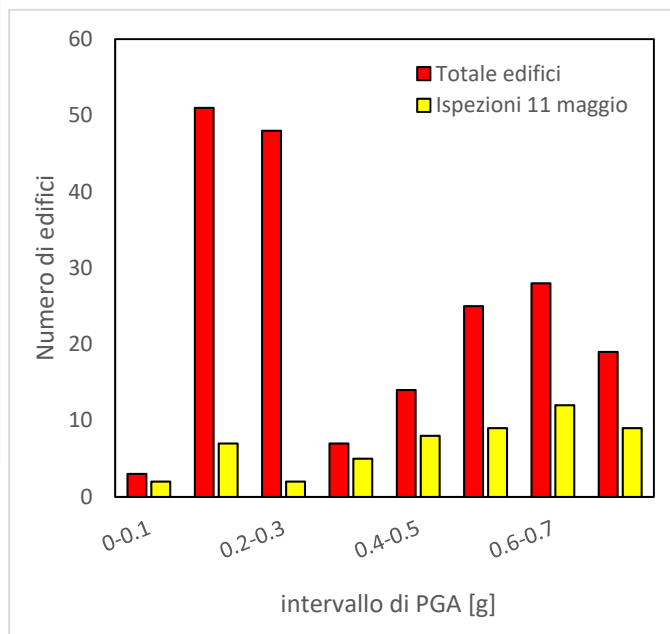
On the 11th of May, eight teams consisting of engineers, and other personnel with technical expertise, were divided into seven working groups. Each group was assigned an engineer from either METU or TED university of Ankara and was tasked with performing post-earthquake inspections of 54 school buildings (mainly primary or middle schools) located in the provinces of Hatay, Maras, Antep and Adana. These buildings were in addition to those already inspected during the past two days (43 on May 9th and 56 on May 10th) bringing the total up to 153 school buildings inspected.

Fig.1a shows the locations of the entire sample of case-study buildings, plotted against the peak ground acceleration (PGA) shakemap of the February 6th M7.8 shock provided by the USGS. On the other hand, Fig.1b plots the frequency distribution, in terms of number of schools per 0.1g-wide PGA intervals experienced by the buildings according to the shakemap, for both the whole building sample and the portion inspected on May 11th. The figure shows that subset of buildings inspected on this day is more representative of the higher PGA brackets.

Tab. 1 lists the names of the inspected school buildings, their construction year, their year of retrofit (if applicable and available), as well as the type of retrofit.



(a)



(b)

Fig. 1 Position of the school buildings, inspected by the seven groups, in overlay against the PGA shakemap of the M7.8 shock of February 6th provided by the USGS (a); frequency distribution of the school buildings with respect to 0.1g wide PGA intervals (b)

Tab. 1 Inspected Structures

Structure name	Construction year	Year of retrofit	Type of retrofit
KURLUSOĞUKSU İLKOKULU A-BLOK	1994	2021	addition of RC shear walls
KURLUSOĞUKSU İLKOKULU B-BLOK	1970	2021	addition of RC shear walls
KARADURMUŞLU İLKOKULU	1993	2022	addition of RC shear walls
AKTAŞ İLKOKULU	2001	2022	addition of RC shear walls
ATATÜRK İLKOKULU	n/a	2022	addition of RC shear walls
KUMLU ORTAOKULU	n/a	n/a	addition of RC shear walls
KARAHÜYÜK İLKOKULU	n/a	n/a	n/a
KARASÜLEYMANLI UZUNKÖY İLKOKULU	anni '90	2022	addition of RC shear walls
AVSUYU ORTAOKULU	2019	no	no
DR.MUSTAFA GENÇAY ANADOLU LİSESİ A BLOK	1999	2010	addition of RC shear walls
DR.MUSTAFA GENÇAY ANADOLU LİSESİ B BLOK	2010	2022	addition of RC shear walls
ANTAKYA İMAM HATİP LİSESİ SOĞUKSU İLKOKULU	1973	2020	addition of RC shear walls
NARLICA İLKOKULU	2005	n/a	n/a
MADENBOYU İMAM HATİP ORTAOKULU A BLOK	1989	2021	addition of RC shear walls
MADENBOYU İMAM HATİP ORTAOKULU B BLOK	n/a	n/a	n/a
ŞEHİT NİZAM AKDENİZ İLKOKULU B BLOK	n/a	n/a	n/a
HARBİYE SELMAN NASIR ESKİOCAK İLKOKULU	1985	2021	addition of RC shear walls
HARBİYE SELAHİDDİN GÜZEL İLKOKULU	n/a	-	no
HARBİYE ATATÜRK İLKOKULU	1989	2021	addition of RC shear walls
HARBİYE ESENBULAK İLKOKULU A BLOK	1998	2023	addition of RC shear walls
GÜNEYSÖĞÜT BEDİ SABUNCU İLKOKULU	1998	2022	addition of RC shear walls
ÇÖKEK ORTAOKULU	2000	2022	addition of RC shear walls
ORHANLI ORTAOKULU	2020	-	no
SUBAŞI MEHMET AKİF ORTAOKULU	1990	2022	addition of RC shear walls
ÇUKUROVA ANADOLU ELEKTRİK LİSESİ OKUL BİNASI	1989	2010	addition of RC shear walls
MTAL D BLOK	2011	-	
TEKEBAŞI KURTULUŞ İLK VE ORTAOKULU	2000/2007	2022	addition of RC shear walls
TEKEBAŞI ZEYNELABİDİN CİLLİ İLK VE ORTAOKULU	1999	2023	addition of RC shear walls
EZC.MERYEM KARAÇAYLI İLKOKULU	2000	2022	addition of RC shear walls
DR.ALAEDDİN CİLLİ İLKOKULU	2000	2022	addition of RC shear walls
ÇÖĞÜRLÜ İLKOKULU	2000/2002	2023	addition of RC shear walls
JAN SUPHİ BEYLUNİ LİSESİ	2001	2021	addition of RC shear walls
ATATÜRK ANADOLU LİSESİ	1978	2021	addition of RC shear walls
NAMIK KEMAL İLKOKULU	1996	2022	addition of RC shear walls
MIZRAKLI ATATÜRK ORTAOKULU	1998	2022	n/a
YUNUS EMRE İLK ve ORTAOKULU	2008	None	no

YEŞİLYURT İLKÖĞRETİM OKULU	2008	None	no
MEHMET AKİF ERSOY İLKÖĞRETİM OKULU	1988	1994	addition of RC shear walls
ALTINÜZÜM FATİH SULTAN MEHMET İLKÖĞRETİM OKULU	1993	2007	addition of RC shear walls
ANADOLU TEKNİK LİSESİ ve E.M.L.	1990	2010	addition of RC shear walls
75. YIL İLKÖĞRETİM OKULU	1999	None	no
FİKRET ÖZTÜRK İLK ve ORTAOKULU	n/a	n/a	n/a
FEVZİ ÇAKMAK İLK ve ORTAOKULU	n/a	n/a	n/a
SEHİT MEHMET YENER	2016	None	no
AKBEZ MTAL A BLOK	1996	2021	addition of RC shear walls
AKBEZ MTAL B BLOK	1996	2021	addition of RC shear walls
ÇARDAK ANADOLU LİSESİ	1985	2021	addition of RC shear walls
15 KASIM İLKOKULU A BLOK	1968	2022	addition of RC shear walls
15 KASIM İLKOKULU B BLOK	2001	2022	addition of RC shear walls
SÖĞÜT ORTAOKULU	1997	2021	addition of RC shear walls
AKTEPE GAZİ ANAOKULU A BLOK	2005		no
AKTEPE GAZİ ANAOKULU B BLOK	1985	2021	addition of RC shear walls
AKTEPE GAZİ ANAOKULU C BLOK	1985	2021	addition of RC shear walls
AKTEPE GAZİ ANAOKULU C BLOK	1985	2021	addition of RC shear walls

Report and photographic material: earthquake damage on the case study school buildings

This section contains a brief description of the more notable types of damaged encountered in the more heavily damaged buildings inspected on May 11th.

- **KARAHÜYÜK İLKOKULU**

The building was demolished after the earthquake and there is no information on either its retrofit or the damage state.



Fig. 2 – Remains of a column.

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- **DR. MUSTAFA GENÇAY ANADOLU LİSESİ A BLOK**



Fig. 3 Raised floor constructed with structural steel and truss-beam roof cover, insufficiently connected to the masonry wall parapets.



Fig. 4 Auditorium in raised floor with widespread damage of the false (suspended) ceiling.

- HÜSEYİN ÖZBUĞDAY LİSESİ OKUL+SPOR SALONU



Fig. 5 Typical short-column type of damage, induced by continuous belt of low-height windows.

- **HACI BEKTRAS VELI ANADOLU LISESI**



Fig. 5 Heavy damage of masonry infills, with out-of-plane collapse, corresponding to the front and back perimeter frames. Damage to the wooden roof cover with dislocation of roof tiles.

- **SUBAŞI MEHMET AKİF ORTAOKULU**



Fig. 6. Column top sheared-off at the construction joint, due to pounding from a (collapsed) adjacent structure: internal and external view (from left to right).

- **Anadolu Teknik Lisesi Ve E.M.L**



Fig. 7 Widespread diagonal cracking of infill and partition masonry walls.

- Yil İlköğretim Okulu



Fig. 8: Out-of-plane failure of infill and partition walls, with overturning.

Report and photographic material: earthquake damage on residential buildings

In the urban areas surrounding the buildings under inspection, various damage patterns and failure mechanisms were observed in residential (and other) buildings. Some notable examples are presented here.

- **City of Antakya**



Fig. 8 Partial collapse of RC beam and floor slab.



Fig. 9 Shear failure of an RC column.



Fig. 10 RC building exhibiting soft-storey failure.



Fig. 11 Shear failure of an RC wall.

- **Città di Saman/aag**



Fig. 12 Overturning collapse of a mosque's minaret.

- **City of Kahramanmaraş**

In addition to the above, it was also possible to observe the damage inflicted on a precast reinforced concrete shed, situated in the industrial zone near the city of Kahramanmaraş, at the location of Türkoğlu.

As shown in Fig.13 and 14, the earthquake-induced damage consists of a loss-of-support of the girders and consequent collapse of the roof cladding.



Fig. 13 – Side-view of the structure.



Fig. 14 – Collapsed roof cladding elements.

Tab. 2 Working Group

MEMBERS	AFFILIATION
Marco DI LUDOVICO	Univ. degli Studi di Napoli Federico II
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Marco GIULIVO	Univ. degli Studi di Napoli Federico II
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Romina SISTI	Univ. degli Studi di Napoli Federico II
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Piero COLAJANNI	Univ. degli Studi di Palermo
Jennifer D'ANNA	Univ. degli Studi di Palermo
Marielisa DI LETO	Univ. degli Studi di Palermo
Gianni BLASI	Univ. of Salento
Gabriele GERRINI	Univ. degli studi di Pavia
Silvia PINASCO	Univ. di Genova
Stefano BRACCHI	Fondazione Eucentre
Davide BELOTTI	Fondazione Eucentre
Numan EREN	Fondazione Eucentre
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Erturk TUNCER	TEDU - Turkish Education Association University
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