SMART REHABILITATION 3.0

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Rehabilitation of a modern building in Nicosia.

Preserving the modern heritage by improving its performance.

Type of intervention

[X] *Restoration* [ ] *Rehabilitation / Renovation*

Concerned elements on the intervention project

[X] *1. Foundations and underground structures*
[X] *2. Vertical structures*
[X] *3. Horizontal structures and vertical connections*
[X] *4. Roof and terraces*
[X] *5. Façade and building envelope*
[X] *6. Finishes and completion elements*
[X] *7. Integrate services*
[X] *8. General strategies for building recovery*

Site	Alexandrou Demetriou Tower, Stasinou & Salaminos Str. Nicosia, Cyprus
Objectives	Restoration.
Property	Private
Designer	Aimilios Michael, Vasilis Ierides, David Castrillo, Stavroula Christofilopoulou, Maria Xenofontos (architects), Giannis Mitsides and Michalis Nikolaides (electrical mechanical engineers), Maria Sinapi and Costas Meletiou (civil engineers).
Date	2009-2012

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Background to the intervention

In 2006, after a period of decline and abandonment, the building was declared under preservation as a monument of Modern architecture and during the years 2006 to 2008, the study for its restoration was initialized and completed.

Description of the building

The building is located at the junction of Stasinou and Salaminos Street, outside the walls of the old city of Nicosia, very close to the Gate of Famagusta. The building was designed by the well-known Cypriot architect Neoptolemos Michaeides in 1957-59 for Alexandrou Dementriou's family, who were importers of argicultural machinery. It was initially designed as a mixed-use building to house the offices and exhibition spaces of Demetriou's company while offering apartments for rent. The building has a rectangular plan with its main axis running from SE to NW. Its total height is 34.50 metres. The ground floor is raised from the ground and includes a large show room. The main entrance to the building is placed on its northern side in order to preserve the continuity of the glazed surface of the show room. The vertical movement towards the upper storeys is achieved through a circular staircase and a lift, while the horizontal on each level through a northern corridor, which provides access to the separate apartments. Each of the seven storeys consists of two 2-bedroom apartments and a studio. On the 8th floor, there is a covered terrace with an unobstructed, 360-degrees-wide view. At the semi-basement a second store and a parking space are placed, while the basement houses offices and secondary spaces.

Due to the full exploitation of the plot's building potential, the open spaces have restricted size, and the presence of vegetation is limited to the sidewalk. Nevertheless, the placement of the building at the centre of the plot and the smaller plan size of the upper storeys compared to that of the ground floor do not give the impression of a compact building volume. On each storey, there are ample semi-open spaces, which are placed on the southern side. The covered flat roof is also a common-use open space. The combination of open spaces with the extensive glazed surfaces provides generous views of the surrounding cityscape and landscape.

The construction of the building is a reinforced concrete structure, with visible frames on the two narrow facades (NW and SE). All in all, there are six frames, without intermediate columns, a fact that allowed the creation of a continuous space on the ground floor and the semi-basement in the initial design. The building is an example of total consistency between architecture and engineering, with the varying profile of the beams following and expressing the moment diagrams. The external walls are constructed with double bricks and plaster and are placed at a recession from the supporting reinforced concrete structure in order to project the structural essence of the building. The windows are metal-framed with single glazing.The circular external staircase is pre-fabricated, similar to the entrance staircase, which leads to the raised ground-floor show room.

The design of the Alexandros Demetriou building incorporates simple passive heating and cooling strategies, namely exploitation of direct solar gains, shading and natural ventilation, as well as daylighting features. The above features are architecturally integrated into the design and contribute to the improvement of the bioclimatic behaviour of the building, especially during the under-heated and over-heated period of the year. The spaces with the highest heating requirements are placed towards the south, whereas secondary and other spaces are placed towards the north, in order to function as buffer spaces.

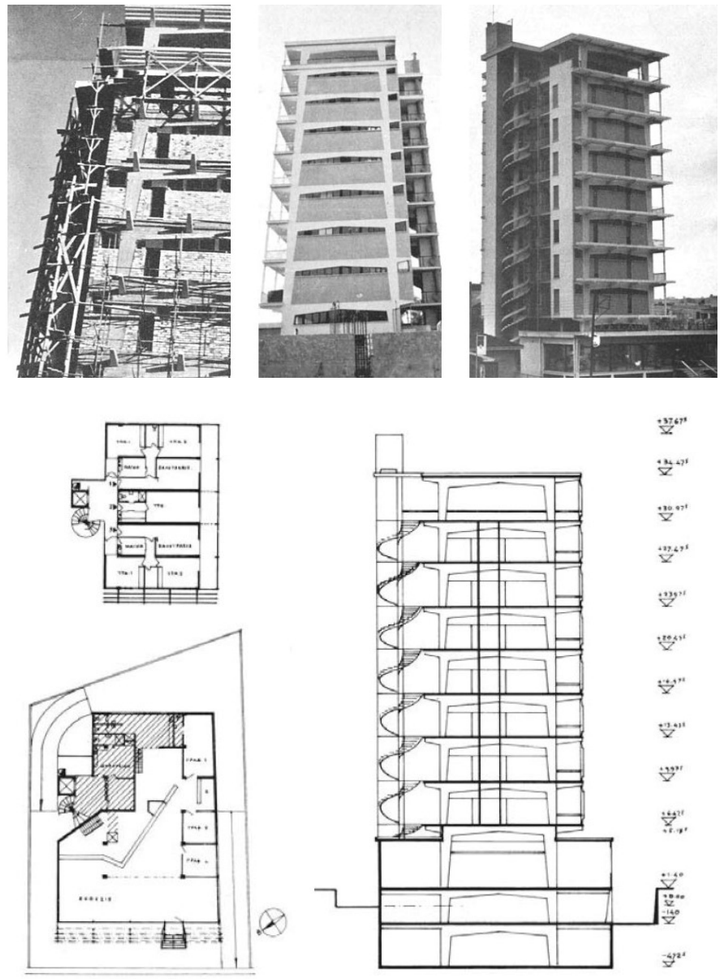

Fig.1-2: Photographs and plans of Alexandrou Demetriou Tower.
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Fig.3-6: Photographs of Alexandrou Demetriou Tower.
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The Diagnosis of the building (values and state)

The building is highly valued since it is a representative example of International Modern Style in Cyprus, designed by the renowned Cypriot Modern architect Neoptolemos Michaildes (architectural and historical value). Additionally, it has environmentally sensitive and climatically rational design of high aesthetic quality (environmental value) and it is considered to be one of the most important projects of the period in the design of high-rise buildings (scientific value). Finally, it has social value since it is a landmark for the area. The identification of the system of values of the building supported the decision-making for it, so that every intervention should be compatible with the specific qualities, aiming at their preservation and transmission to the future generations.

The lack of maintenance was the main factor who led the building to a state of decay. However, the building was in a good structural condition before restoration.

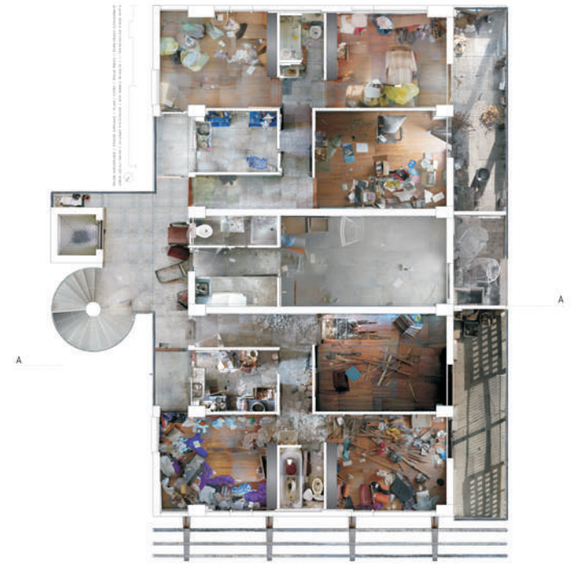

Fig.7: Photographic Recording of the section and the plans of the buildings. © Students' project UCY, 2009.

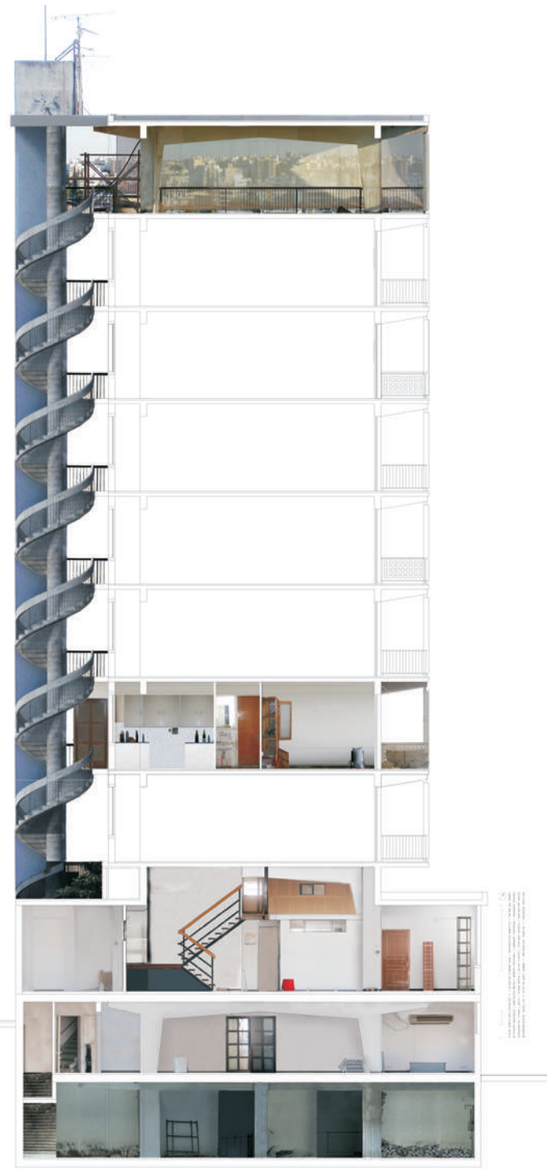

Fig.8: Photographic Recording of the section and the plans of the buildings. © Students' project UCY, 2009.

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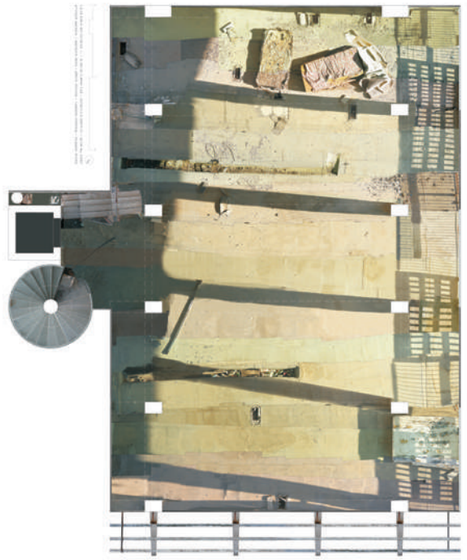

Fig.9: Photographic Recording of the section and the plans of the buildings. © Students' project UCY, 2009.

Fig.10-11: Photographs of the building before the intervention.
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Restoration works

The restoration project seeks to redesign the building without altering its original character and accurate outline. The plan is reorganized based on the conceptual view and bioclimatic approach of the original design, aiming to improve thermal and visual comfort conditions. In all seven storeys, the initial use -housing- is restored, but altered, unifying the three separate apartments (the 2 apartments and the studio) in one.

Another housing unit is added in the place of the covered terrace of the 8th floor. Its façade is kept at a distance from the structural elements, aiming at the preservation of the initially "empty" eighth floor concept. The ground floor shop is restored to its initial design. An entertainment space is proposed for the semi-basement. The facades of the building are carefully redesigned and receive the minimum interventions.

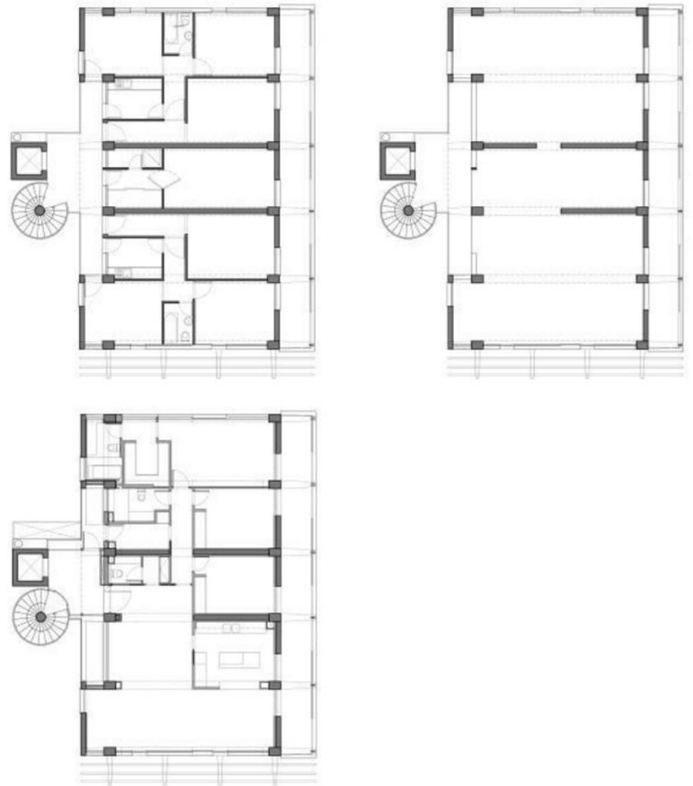

Fig.12: Current situation plan, Demolition plan & Intervention plan.
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The initial design incorporates simple passive heating and cooling strategies, namely exploitation of direct solar gains, shading and natural ventilation, as well as daylighting features. The above features are architecturally integrated into the new design and contribute to the improvement of the bioclimatic behaviour of the building, especially during the under-heated and over-heated period of the year. The improvement of the

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thermal behaviour of the building shell comprises the increase in the thermal insulation of the wall elements and the openings. Thermal insulation (8-cm thick rock wool) is placed on the interior side of the exterior walls, with a final layer of gypsum boards. This solution was judged preferable mainly because it provides adequate insulation without affecting the morphology of the building, even though it isolates the thermal mass of the construction elements. The existing windows are replaced with new thermal-break aluminium window frames with low-eglazing. Furthermore, parts of the glazing are not operable in order to reduce infiltration thermal losses.

The efficient cross-ventilation of the building spaces is ensured with the opening of selected parts of the glazed surfaces and carefully placed openings on external walls and interior partitions. The shading of the openings is achieved with exterior thermal-insulating aluminium louvers, which provide adequate shading, while ensuring visual comfort and pleasant views. Interior fabric rolls provide additional daylighting control.

Visual comfort in the building is expressed in terms of natural light and unobstructed view to the old city of of Nicosia The existing pleasant view is getting stronger through the creation of planting areas in some areas of the building. Also, vegetation is placed to the roof of the exhibition space in the ground floor, serving as open space of the 1st floor apartment. Apart from vegetation, a shallow pool is placed for the improvement of the micro- climatic data of the building. Thus, the surface temperatures are reduced in presence of trees and the comfort is improved.

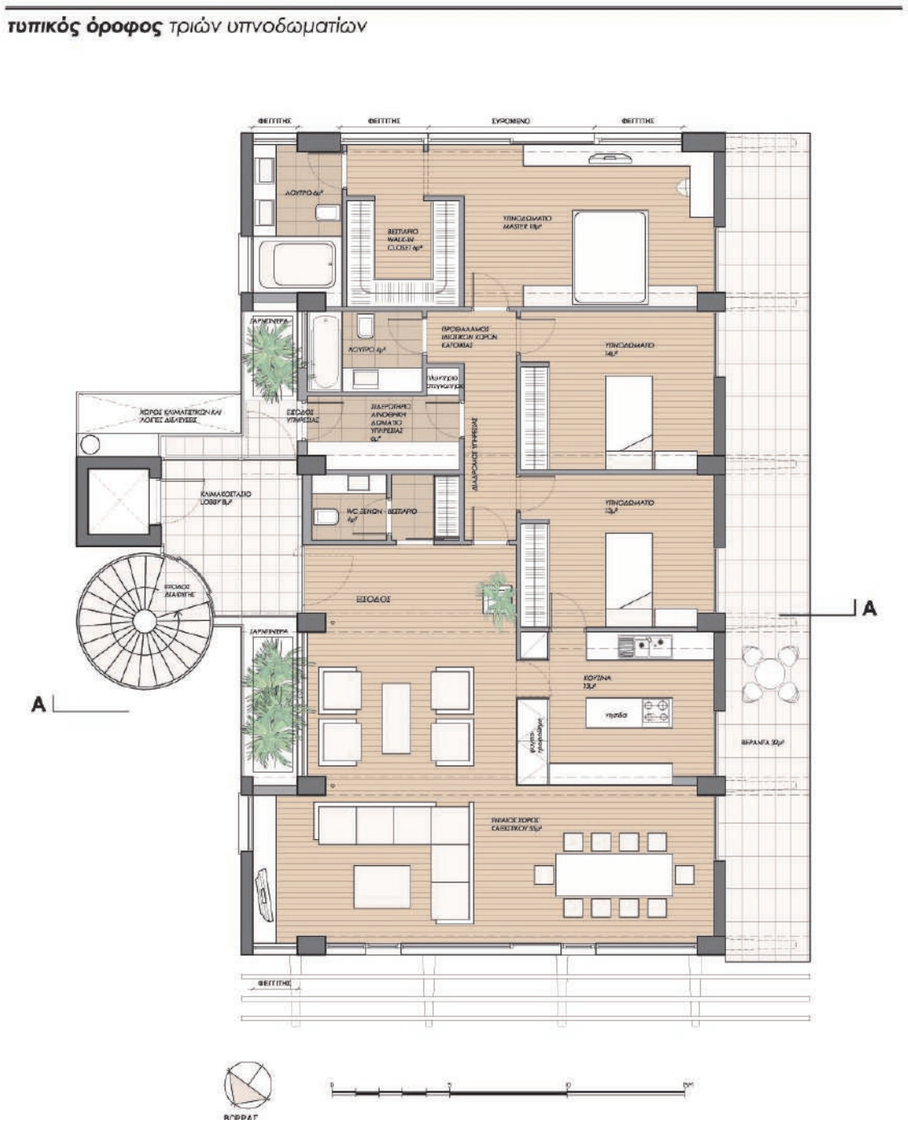

Fig.13: Typical floor plan after intervention. © A. Michael's archive.

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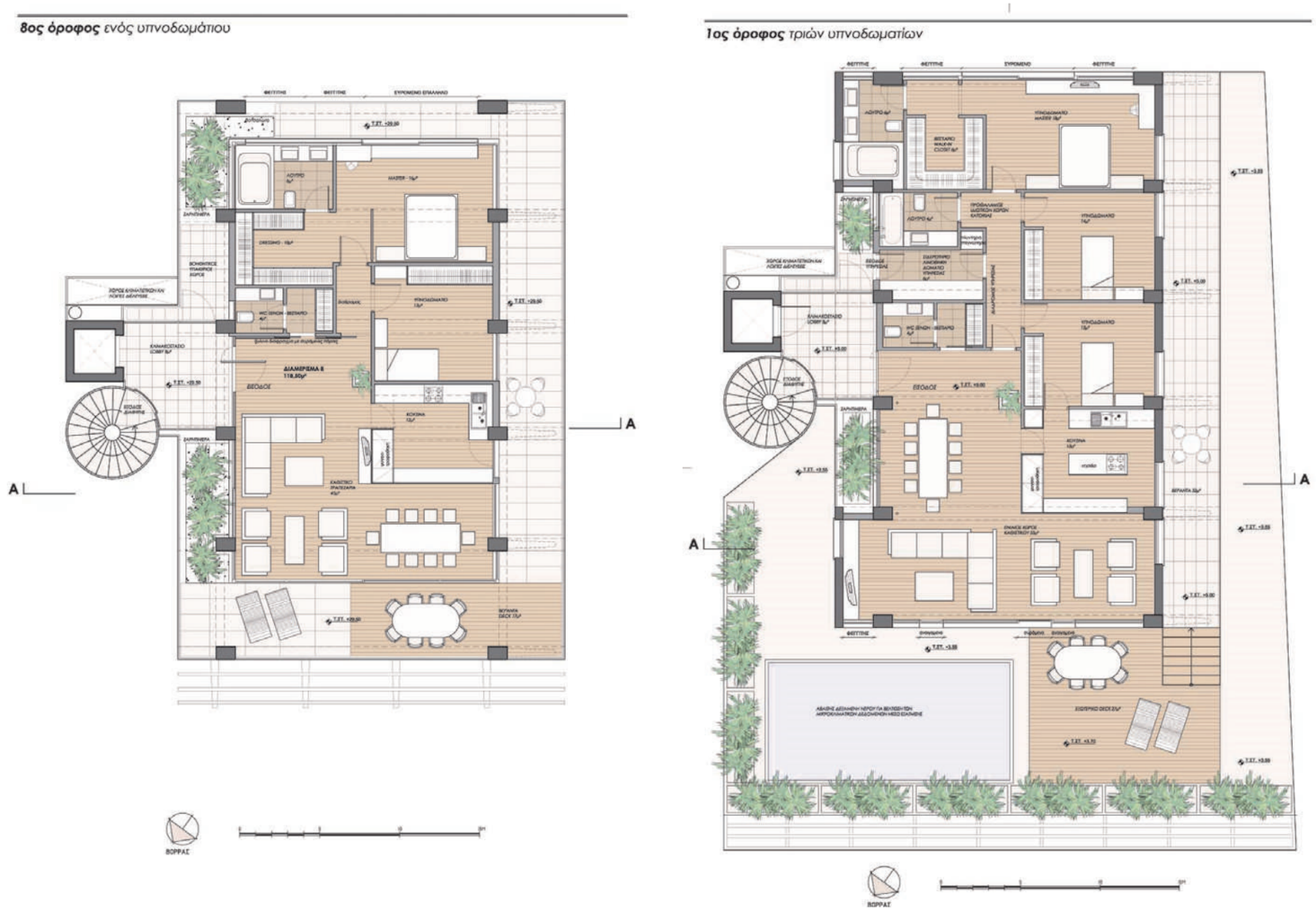

Fig.14-15: Floor plans after interventions. The planted areas and the the shallow pool. © A. Michael's archive.

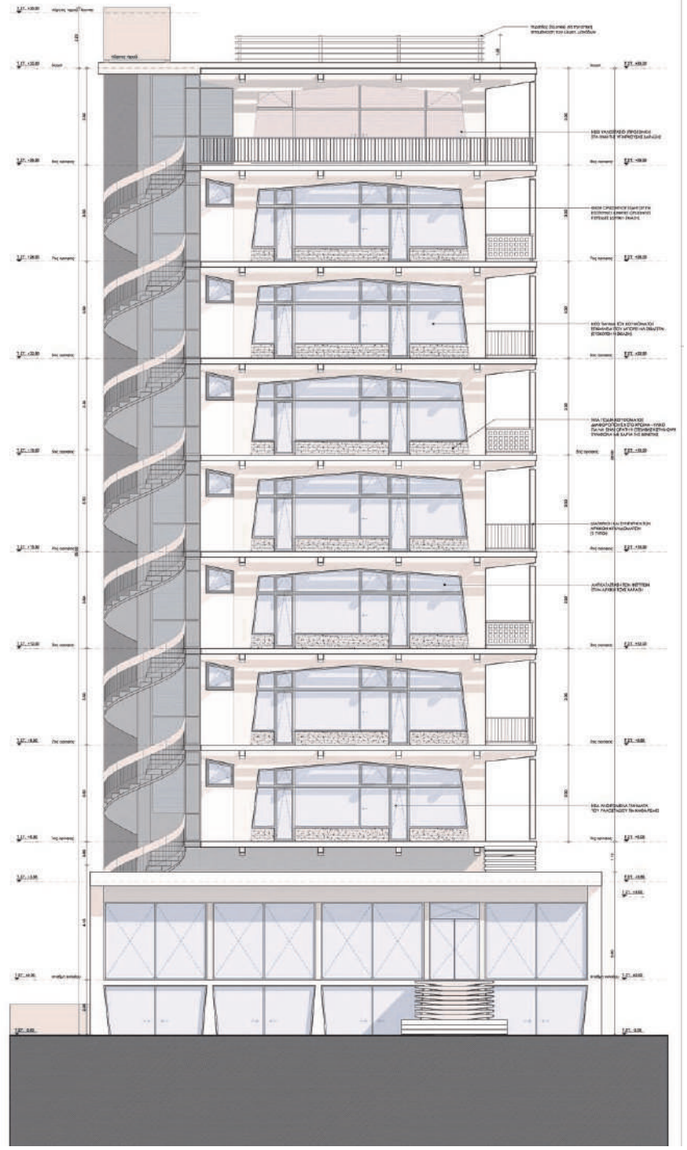

Fig.16: Elevations after interventions. © A. Michael's archive.

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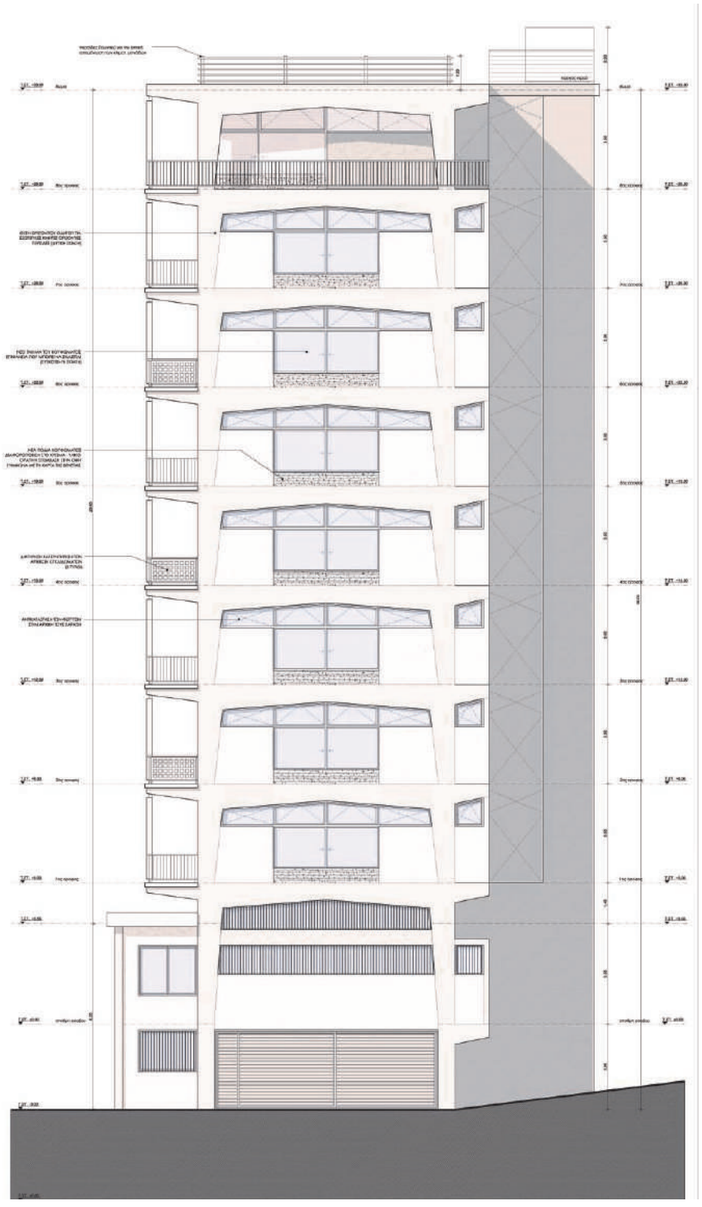

Fig.17: Elevations after interventions. © A. Michael's archive.

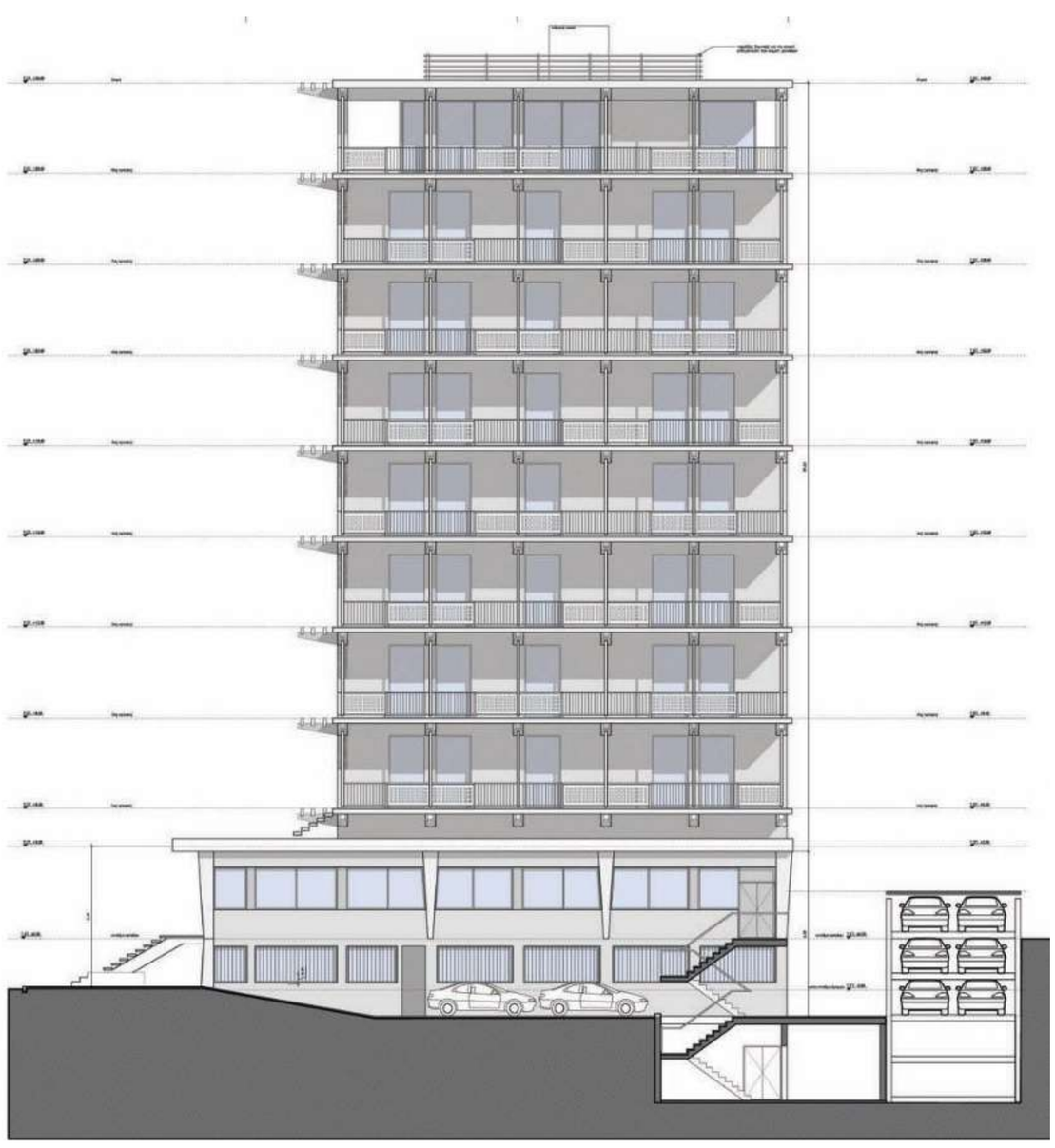

Fig.18: Elevations after interventions. © A. Michael's archive.

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Fig.19-20: Photographs before and after interventions. © A. Michael's archive.

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Fig.21-24: Interior space after interventions. © A. Michael's archive.

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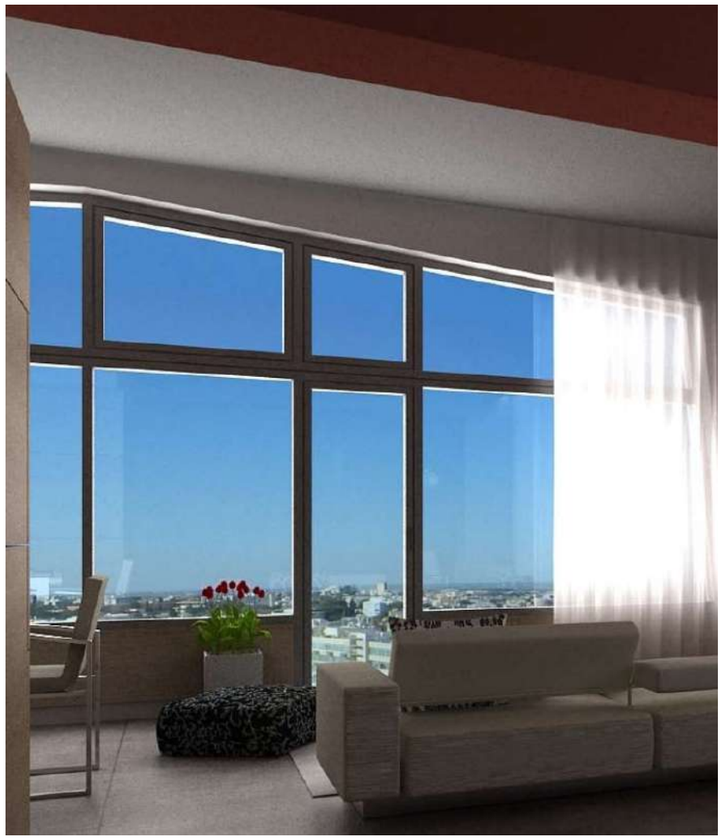

Fig.25: Interior space after interventions. © A. Michael's archive.

Assessment of the results

The restoration project respected the initial building's design and significance and contributed to the functional and energy upgrade of the building. The bioclimatic rearrangement of the plan, the promotion of the existing cooling strategies and the thermal insulation of the building shell increased thermal comfort and reduced energy consumption. Thus, the building became comfortable for its inhabitants while respecting the environment.

Fig.26: Interior space after interventions. © A. Michael's archive.

References

1. Michael, A., Christofilopoulou, S., Ierides, V., Conservation of Modern-Movement Architecture: The Alexandros Demetriou Building Case. The Challenge of Change X2, 1st Docomomo Cyprus Scientific Meeting, 5.11 – 6.11.08, University of Cyprus, Nicosia, Cyprus, Nicosia, December 2008 (10 p.), in Greek

2. Michael, A., Ierides, V., (2009) Building Restoration and Bioclimatic Design Considerations, Alexandros Demetriou Building in Nicosia, Neoptolemos Michaelides, 1959. IHT-IST (ed.), Proc. of the 9th National Conference on Renewable Energy Sources, 26.03 - 28.03.09, Paphos, Cyprus, ISSN 1108-3603, pp. 233-242, Giahoudis Publications, Thessaloniki, March 2009 (10 p.), in Greek and extended abstract in English

3. Michael, A., Ierides, V., (2013) Conservation and Modern Architecture Reserves: The Alexander Demetriou Building Case, Nicosia, Cyprus. Proc. of the 12th Int. Con. on The Survival of Modern, from Coffee Cup to General Plan, Docomomo Conference, 07.08 – 10.08.12, ISBN 978-952-93-2300-5, Espoo, Finland, pp. 258-264

4. Michael, A., Christofilopoulou, S., Ierides, V., (2009) Conservation of Modern-Movement Architecture: The Case of the Alexandros Demetriou Building. Archive Architectural Journal, 6 (2009), 78 - 84, CAA, ISBN: 1450-3441, in Greek

5. Michael, A., Constantinou, Ch., (2009) The Conservation of Modern Heritage and the Theory of Evolution. Architects + Civil Engineers, 85 (2009), CCEAA, Response Publications, 19 - 24, in Greek