

# 用途複合型集合住宅の建設システムの合理化(新規)

## Rationalization of Construction System of Apartment Building for Compound Usage (New)

建物が密集する都市部の集合住宅では、下層部分を駐車場や店舗として利用する用途複合型とすることが合理的であり、建築計画上也必要不可欠な場合が多い。この種の構造物はピロティと呼ばれ、1995年の兵庫県南部地震では大きな被害を受けたが、その設計法に関しては崩壊メカニズムが必ずしも明確になっていないことから、改善の余地が残されている。

本研究では、この状況を打開し、ピロティ形式建物を耐震上、より高性能かつ合理的に建設するために、その崩壊原因の解明、耐震性能評価法の開発、設計・施工システムの開発を行う。

本研究成果は、ピロティ形式集合住宅の建設システムの確立、ピロティ構造に関する設計・施工の諸規定の見直し、ガイドラインの整備などに活用される。

In urban areas, many residential complexes were built with a pilotis structure, so the space on the ground floor could be opened for a wide variety of uses including shops and car parks. These structures, however, were severely damaged in the Kobe earthquake of Jan. 1995, which highlighted the vulnerability of these ground floor structures. In response to this, seismic design standards were revised to design pilotis with a greater safety margin and ensure that the structure would be designed to avoid collapse of first story columns. The section dimensions of the columns have been increased and large amounts of reinforcement are now required, which has reduced the amount of space available on the ground floor. These precautions are necessary because the failure mechanism of the structure has still not been

clarified.

The purpose of this research is to rationalize the construction system of pilotis. The research aims to clarify the failure mechanism, to develop a seismic evaluation method, to create a reasonable and safe system for design and construction of pilotis, and to develop techniques for strengthening existing vulnerable structures which have been constructed and designed on the basis of pre-Kobe standards.

The expected results will be a proposal for a rationalized construction system for constructing pilotis, and guidelines on strengthening existing structures.

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技術開発の概要 / Technology Development Outline

### 用途複合型集合住宅の建設システムの合理化 Rationalization of construction system of apartment building for compound usage

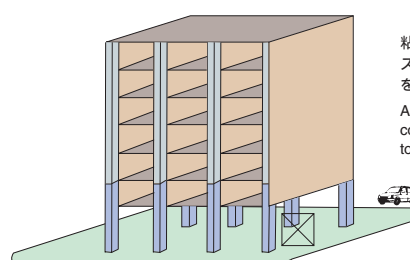


1995年の兵庫県南部地震で大きな被害を受けた建物。1階が完全に潰れている

This four story building was collapsed at the ground floor where only the columns supported the upper stories.

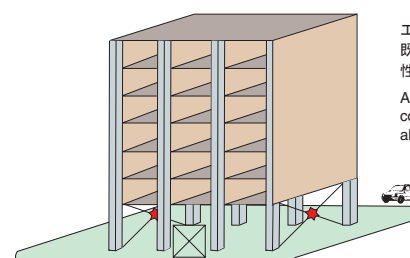
崩壊メカニズムの解明  
設計詳細の検討・改善  
性能に着目した合理的設計法の開発  
既存建物の補強手法の開発

- Clarification of failure mechanism
- Improvement of structural detail
- Development of rationalized design method based on performance evaluation
- Development of strengthening techniques for existing structures



粘り強いCFT柱の利用で、スリムな柱、広い1階の空間を確保

A possible solution: applying concrete confined tubes (CFT) to lower story columns.



エネルギー吸収装置の利用、既存の脆弱なピロティの耐震性改善にも活用

Another solution: response control by using an energy absorbing device.