

DEVELOPMENT OF A HOUSING COMPLEX IN ACCORDANCE WITH THE SURROUNDING HISTORIC URBAN AREA: *HEISEI-NO-KYOMACHIYA* PROJECT

S. Morishige¹, M. Takada²

¹ Mukogawa Women's University, Japan

² Kyoto University, Japan

Keywords: housing complex, *machiya*, Kyoto, historic urban area, *heisei-no-kyomachiya*

Introduction

This paper aims to show how the housing complex '*Heisei-no-Kyomachiya Higashiyama Yasakadori*' project was designed in accordance with the context of the surrounding historical environment. The housing project is located in a high density area of Kyoto city. Around the site there are many *Machiyas* remaining, which effectively preserves the traditional landscape. A *Machiya* is a traditional wooden townhouse, and *Machiyas* in Kyoto are called '*Kyomachiyas*'.

Methods

This is a case study aimed at developing a housing design method which enables a housing complex to fit in with its surrounding historical built environment, without sacrificing performance in meeting contemporary needs. The most important characteristic of this study is that it is a real project executed through collaborative research with a local housing developer. The housing project construction was completed by January 2014, and all units have been occupied since the spring of that year.



Fig. 1: aerial photo of the project site



Fig. 2: analysis of building configuration around the site



Fig. 3: front road of the project site

Application of the concept of 'Heisei-no-Kyomachiya'

'Heisei-no-Kyomachiya' is a conceptual framework for a local, modern eco house design paradigm, advocated by Kyoto city government since 2010. This framework was developed due to a serious concern that global models of eco housing, which typically include thick thermal insulation, would destroy the traditional landscape comprised of layered wooden fixtures such as lattices, doors and windows, which has been cultivated over a long history of local dwelling culture in Kyoto city. Our housing project was launched with the aim of applying this framework when designing a housing complex. The key concepts of 'Heisei-no-Kyomachiya' are: incorporating intermediate spaces known as 'environmental conditioning spaces' which link the internal and external spaces of the dwelling, and promoting maximum wind flow to cope with the hot and humid climate in the Kyoto basin.

Analyzing the surrounding environment

Eight housing units needed to fit within the project site, which is roughly 1000 square meters. First, we examined how to layout the eight houses to conform to the existing landscape and to most efficiently utilize the limited site area. We examined several layout possibilities from the following points of view: consistent arrangement with the surrounding built environment, garden layout, efficiency in land use, and maintaining a connection to the neighboring alley.

| house layout type | layout plan | | | | | |
|--|------------------------------------|--------------------------|-------------------------|--|----|--------------------------|
| | parking space individually located | | parking space collected | | | |
| A type | A1 | evaluation | A2 | evaluation | A3 | evaluation |
| | | a ○ b ○ c ○ d × | | a × b ○ c × d ○ | | a ○ b ○ c × d ○ |
| B type | B1 | evaluation | B2 | evaluation | / | |
| | | a ○ b ○ c ○ d ○ | | a ○ b ○ c × d ○ | | |
| C type | C1 | evaluation | C2 | evaluation | C3 | evaluation |
| | | a × b ○ c ○ d × | | a × b ○ c × d × | | a × b ○ c × d ○ |
| D type | D1 | evaluation | D2 | evaluation | D3 | evaluation |
| | | a × b × c × d × | | a × b ○ c ○ d × | | a × b × c ○ d × |
| evaluation points | | | | | | |
| a : arrangement consistency with the surrounding built environment b : planning of gardens, accessibility and continuation c : efficiency of the land use d : connection to the neighboring blind alley | | | | legend <ul style="list-style-type: none"> pathway private gardens house unit car parking space common garden | | |

Fig. 4: examination of housing layout possibilities

Five design principles

We brought forth additional new concepts developed from the original principles of 'Heisei-no-Kyomachiya' in order to design a housing complex consisting of eight houses, as opposed to the original concept, which was intended to be applicable to an independent, single dwellings. The new concept is based on five design principles: maximum wind flow, nested environmental conditioning space, accessible interconnected open space, adaptable and sustainable floor plan, and the establishment of management rules.

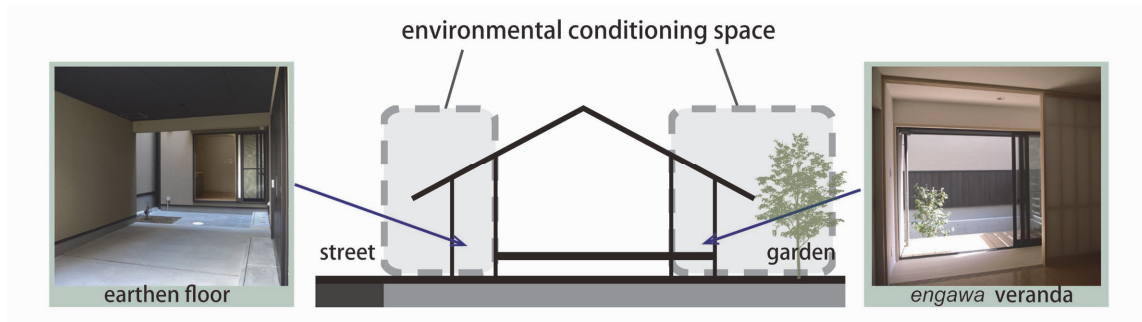


Fig. 5: concept of environmental conditioning space

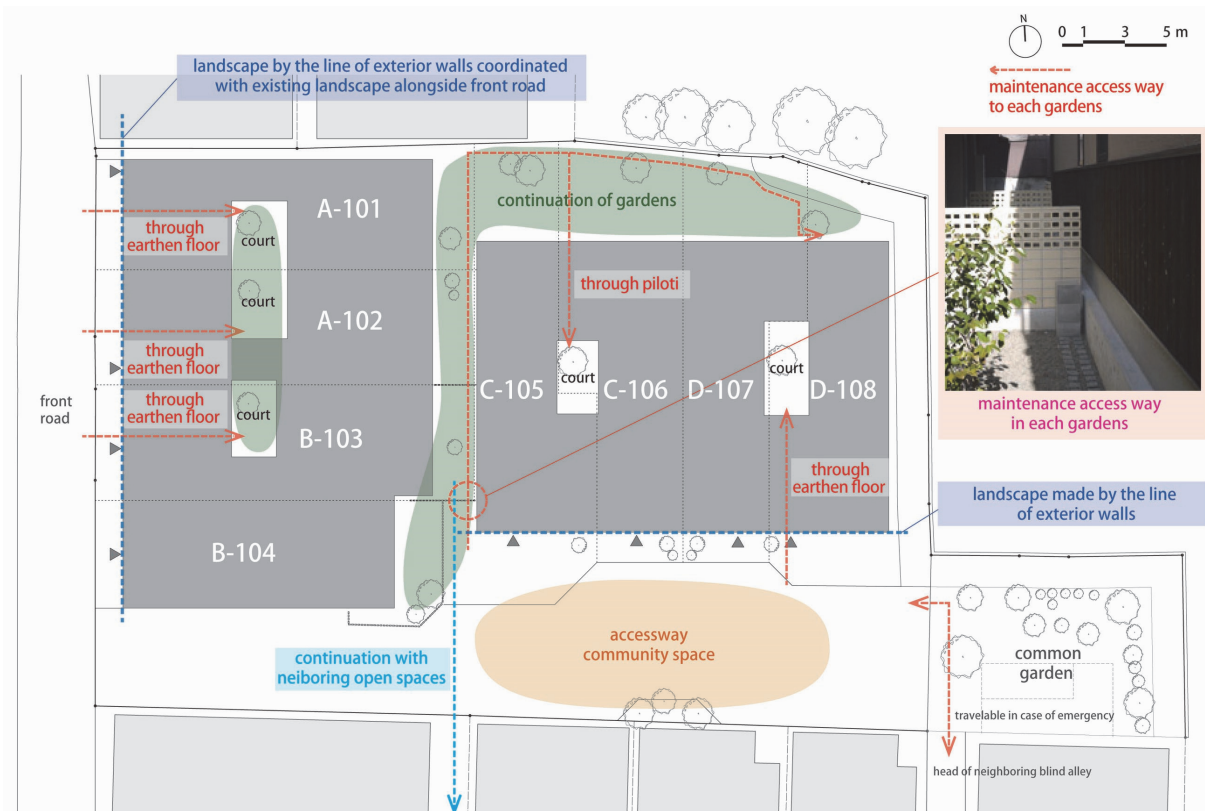


Fig. 6: housing layout plan

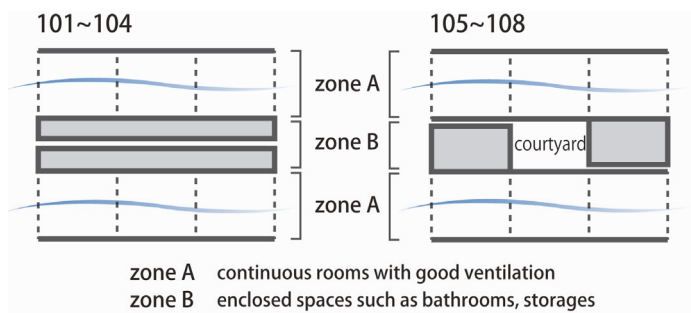


Fig. 7: concept of wind flow

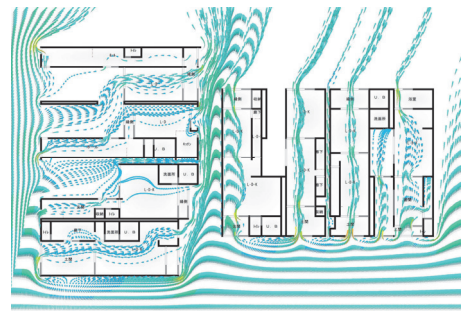


Fig. 8: wind flow simulation

Concluding remarks

While awareness of energy-saving housing design is now required more than ever under the worsening climate change crisis, the broad application of global eco house models may cause serious damage to the historical urban environment of Kyoto, which has accumulated traditions and culture over a long and rich historical context. The design process utilized in this project can be considered as a leading model in making housing complexes better able to fit into their surrounding historical environment.



Fig. 9: photos of the completed project

References

- [1] Shingo, M et al. Design of the Heisei-no-Kyomachiya Housing Complex/K-cho Project Part 1. *Summaries of technical papers of Annual Meeting Architectural Institute of Japan, Architectural Design*, pp.28-29, 2013 (in Japanese)
- [2] Sachiko, M et al. Design of the Heisei-no-Kyomachiya Housing Complex/K-cho Project Part 2. *Summaries of technical papers of Annual Meeting Architectural Institute of Japan, Architectural Design*, pp.30-31, 2013 (in Japanese)