INTRODUCTION

In spite of having carried out renovations, the improvement effect of the indoor thermal environment being insufficient or actually worsening has been observed. Dew condensation and mold caused by adiabatic airtightization also have been generating damage, so measures for lowering high humidity are needed for adiabatic repairs of existing residences where there is anxiety about a shortage of ventilation. In previous research, although the effect of the room temperature rise and heat load reduction by renovation has been reported based on measurement survey and numeric simulation, the factors which influence greatly comfortable nature, healthy nature, and durability such as temperature-and-relative-humidity change and dew condensation quality of each part construction are disregarded. So, in this research, construction thermal environment and heat load analysis software 'THERB' is used, and it clarifies the influence on the energy-saving effect and temperature and relative humidity environment by adiabatic repairs by predicting the compound movement of the heat, moisture, and air of the whole construction in detail.

CONTENTS AND CONDITIONS OF CALCULATION

The plan view of the room of the highest floor wife side and the center of the middle story of the object residence are shown in Fig. 1. It is aimed at the center of the middle story as well as the highest floor wife side in order to consider the differences in the outer wall area, and the influence of the existence of a roof. The basal condition and adiabatic repair conditions which were used for calculation are shown in Tables 1 and 2. The region for calculation was the Ⅱ~Ⅳ area which was selected by IBEC from the area which was classified based on a next-generation energy-saving standard. Extended AMEDAS meteorological data (standard year) was used for meteorological data. Living conditions were set up as being a general four-person household using SCHEDULE Ver2.0, and took into consideration the generation of heat and humidity by a person staying in the room. In the sitting room, the heating apparatus was an open type gas heater which burns natural gas and generates 138.3 [g/h] per heating load 1 [kW] of vapor. In order to clarify the effect of renovation, it used the same heating apparatus (basal condition) after partial repair. The adiabatic specifications after renovation were based on an energy-saving standard (specification standard) of each area using phenolic foam, which has high humidity pass resistance, in consideration of the prevention of internal dew condensation. Partial repair took on five patterns in the middle story, and seven patterns in the highest floor in reference to a general example. Moreover, in order to clarify the air-conditioning conditions, adiabatic specifications, and the relation of the construction temperature and relative humidity environment, as shown in Table 3, air-conditioning conditions and adiabatic specifications were changed after the whole repair. By doing so, the method which keeps humidity low was researched. The temperature and relative humidity of each part construction, the amount of dew condensation and the heat load of each room were outputted for each calculation condition. Comparison and consideration were carried out about the energy-saving effects and the temperature and relative humidity environmental transformations of a renovation.