

# 48-747 Shape Grammars

*Japanese Tea Rooms*

The Japanese tea ceremony, *cha-no-yu*, introduced into Japan by the Zen Buddhists from China in the 16-th C

Basic tenets of the ceremony—harmony (*wa*), reverence (*kei*), purity (*sei*), and tranquility (*jaku*)—

appreciated by all persons regardless of status:

commoners, merchants, nobility, military, and monks alike.

The tearoom was the space reserved exclusively for the tea ceremony.

A place where a host and his guests meet in a secluded atmosphere to drink tea and reflect on the aesthetic qualities of particular objects—

a scroll painting, piece of calligraphy, flower arrangement, or the utensils of the tea service—and to cast aside the tensions and obligations of the material world.

## The Japanese Tea Ceremony

The original tearoom was an area set aside in the living room of a private home, with portable screens used to separate the area from the rest.

The modern Japanese tea house, *chashitsu*, is modelled after Sen-no-Rikyu's *sukiya* style of architecture.

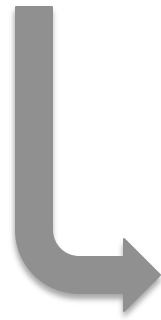
A small, wood framed hut with a thatched roof and rough clay walls perforated at varying heights by small *shoji*-covered windows.

The interior consists of a room for the tea ceremony, no larger than four and one-half mats, a small room adjoining the tearoom used as a kitchen, pantry, or storage area, and, optionally, a room for tea related activities.

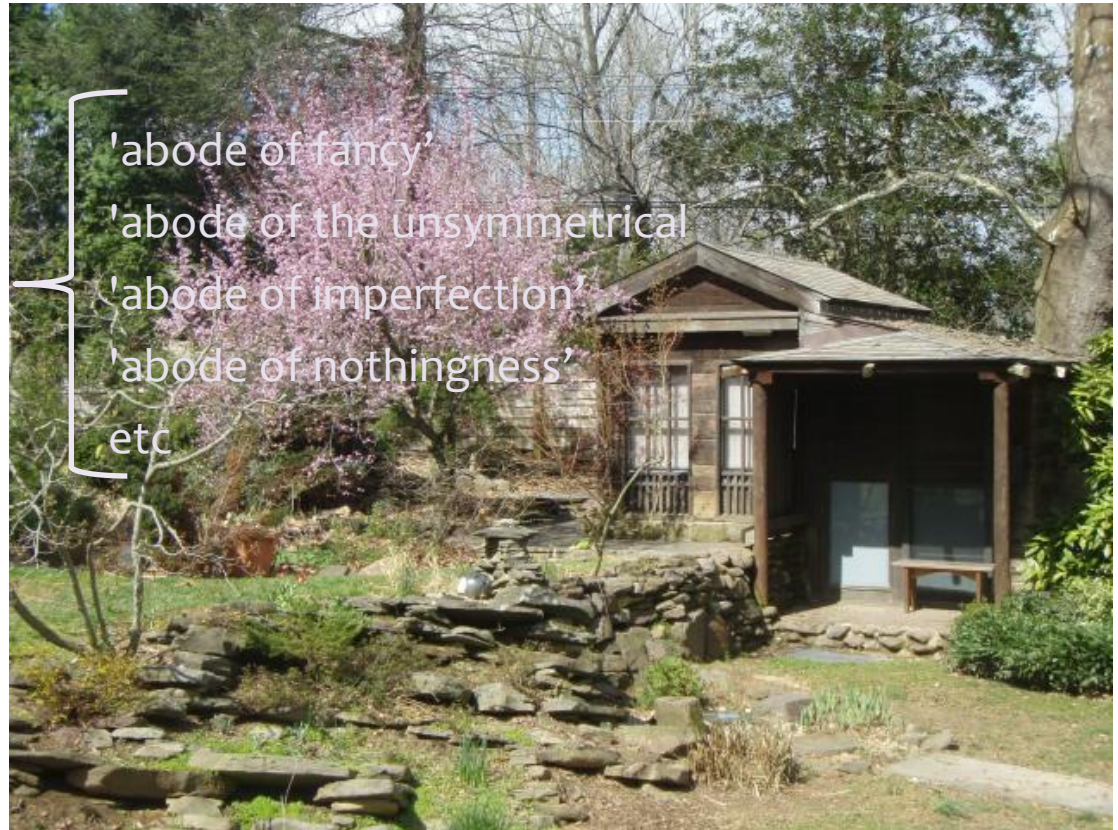
## The Japanese Tea House

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Separated by a garden from the main house, the hut is approached via an earthen path with carefully placed stepping-stones



Japanese Tea House

The entrance for the guests (*nijiriguchi*) is a small, square sliding, door approximately two and one-half feet square. The act of lowering oneself physically to enter the tearoom is simultaneously an act of humbling oneself before partaking in the tea ceremony. The guest entrance from the garden leads directly into the tearoom.

The entrance into the tearoom for the host (*sadoguchi*) adjoins another room of the teahouse. Typically, this is a single, sliding panel.

A third entrance, the servants entrance (*kyujiguchi*), is provided for serving meals. It is also reached from the interior of the house.

## Japanese Tea room - entrances



1. *Sadoguchi* (Host entrance)
  2. *Tokobashira* (Pillar)
  3. *Otoshigake* (Tokonomo lintel)
  4. *Kakejiju* (Hanging scroll)
  5. *Tokogamachi* (Bottom beam)
  6. *Temeaza* (Tea master's tea mat)
- Tokonomo* (Alcove)

## Japanese Tea Room

The basic plan of a tearoom is symmetric—its dimensions are based on the *ken* grid (approx 6'), and the arrangement of *tatami* mats is generally bilaterally symmetric—the addition of certain elements create an asymmetrical plan.

These are the *tokonoma* (an alcove containing a picture scroll and sometimes a flower arrangement) and, frequently, a three-quarter mat or *daime*.

This asymmetry or imbalance reflects the Zen attitude that balance or sense of completeness inhibits the imagination and leads to mental stagnation.

Basic plan

Spatial effect of a *daime* is accented by a narrow wall with an open lower section, a *sodekabe*, which protrudes into the room at the mat joint.

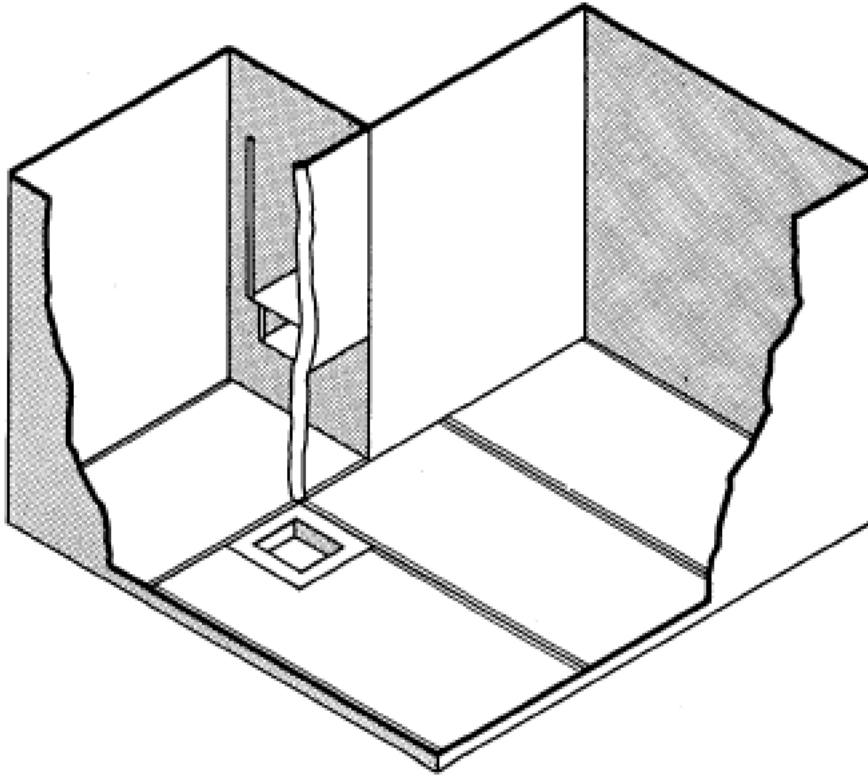
Connected to this wall is a curved, wooden pillar, the *nakabashira*; its base connects with a small, square, sunken hearth, the *ro*, used for heating water for tea.

Shelves, or *tana*, attached to the *sodekabe* are used by the host during the tea preparation.

The open section of the *sodekabe* enables guests to witness the tea preparation whereas the closed section above hides the *tana* from view

Interior of a Japanese tea room





Showing the:

*daijime* (three-quarter mat),

*sodekabe* (wall with open lower section),

*nakabashira* (wooden pillar),

*tana* (shelves attached to the sodekabe), and

*ro* (hearth sunk in floor)

Interior view of a tearoom

1. *The ken grid (schemata 1-4)*
2. *Wall placement (schema 5)*
3. *Location of the ro (hearth) without a daime (three-quarter mat) (schemata 6-9)*
4. *Location of the daime, sodekabe, nakabashira, tana, and ro (schemata 10-12)*
5. *Location of the tokonoma (picture recess) (schemata 13-15)*
6. *Adding a space adjacent to the tokonoma (schema 16)*
7. *Entrances (schemata 17-36)*
8. *Tatami arrangement (schemata 37-41)*

**The grammar**

*Design on a ken grid system produces only rectangular plans whose proportions vary according to the size of the underlying grid.*

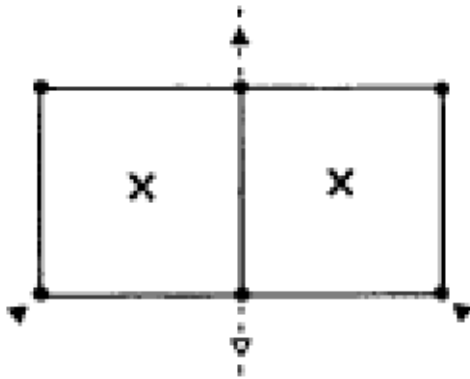
- These proportions are controlled by uniform grid dimensions of  $2m \times n$  ( $m$  and  $n$  are integers  $>1$ ) where each grid cell represents an area one-half ken square.
- The notable exception to this convention is the four-and-one-half-mat room based on a  $(2m + 1) \times n$  grid.

Exemplar is the **Tai-an tearoom** at Myoki-an near Kyoto

The ken grid

Two grid cells bisected by an axis indicated by a broken straight line labelled by the symbol  $\nabla$ .

*This axis simply fixes the bilateral symmetry of any plan generated from the initial shape.*

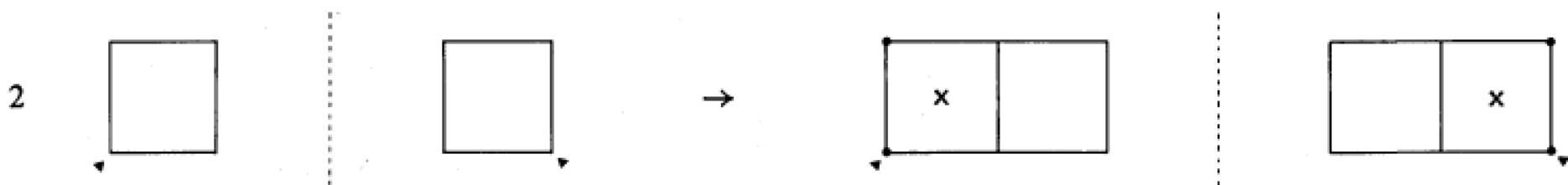
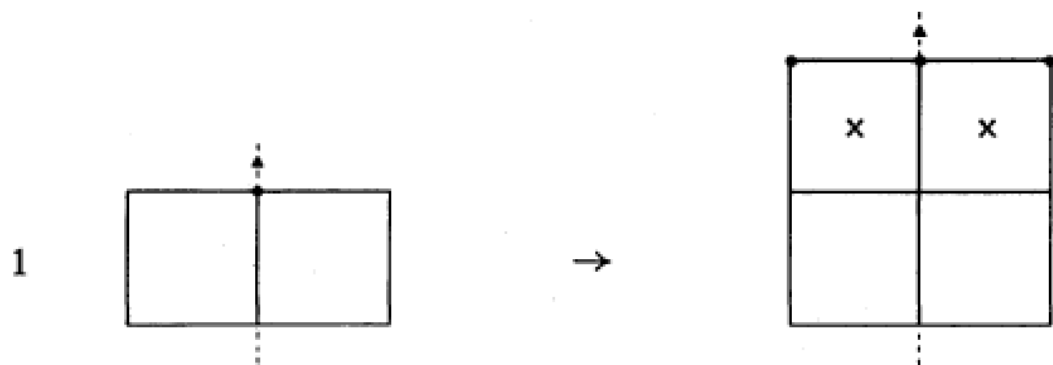


Symbol  $x$  labels the centroid of each grid cell.

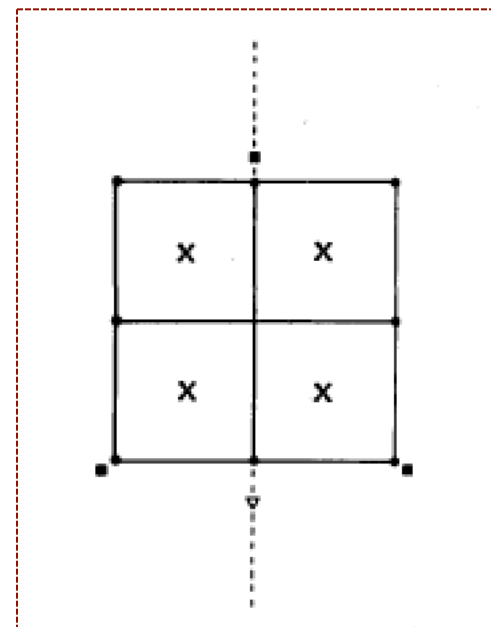
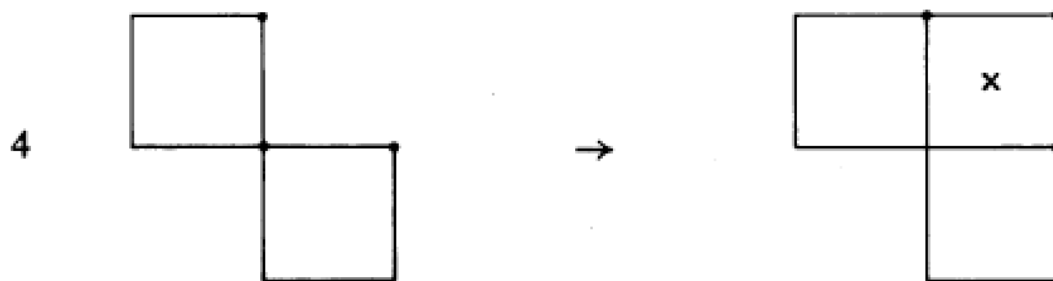
Attached to the vertex of each cell is the symbol  $\bullet$ , which is used to fix the dimensions and locations of entrances.

Symbol  $\blacktriangle$  is associated with two vertices of the initial shape and with the midpoint of one of its edges.

Initial shape

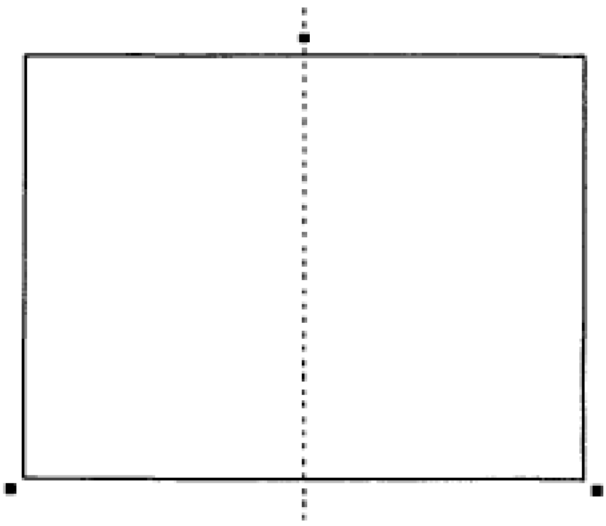


3  $\langle s_\phi, \{(0, 0): \blacktriangle\} \rangle \rightarrow \langle s_\phi, \{(0, 0): \blacksquare\} \rangle$

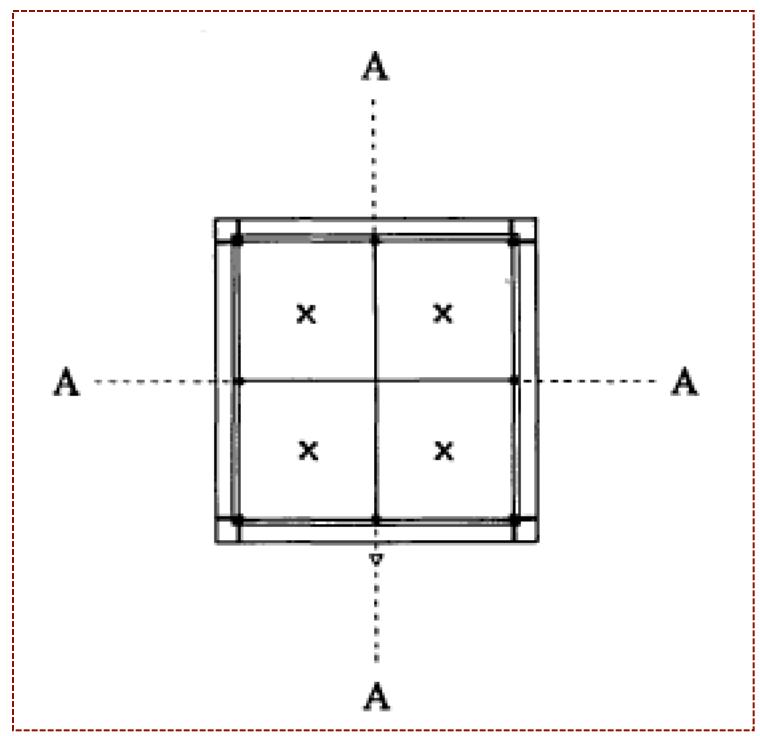
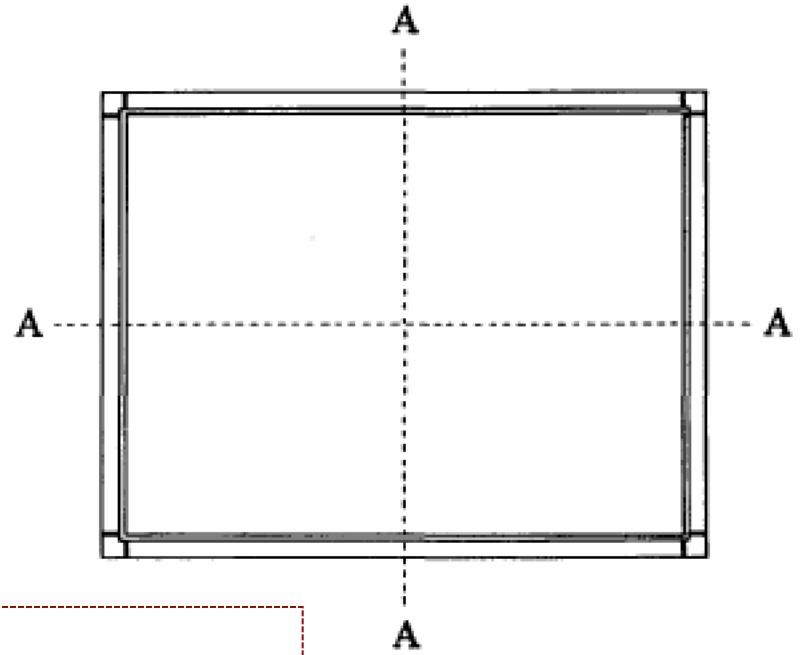


1 generating bilaterally symmetric  
 $2m \times n$  grids

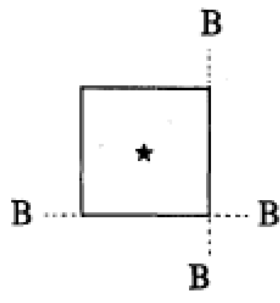
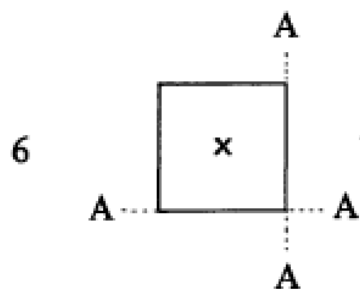
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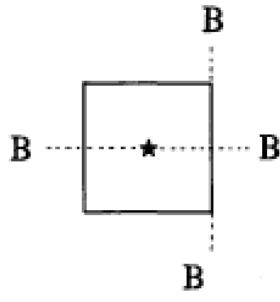
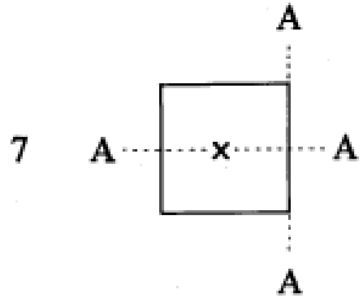
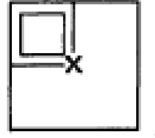
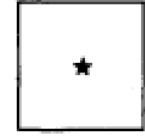
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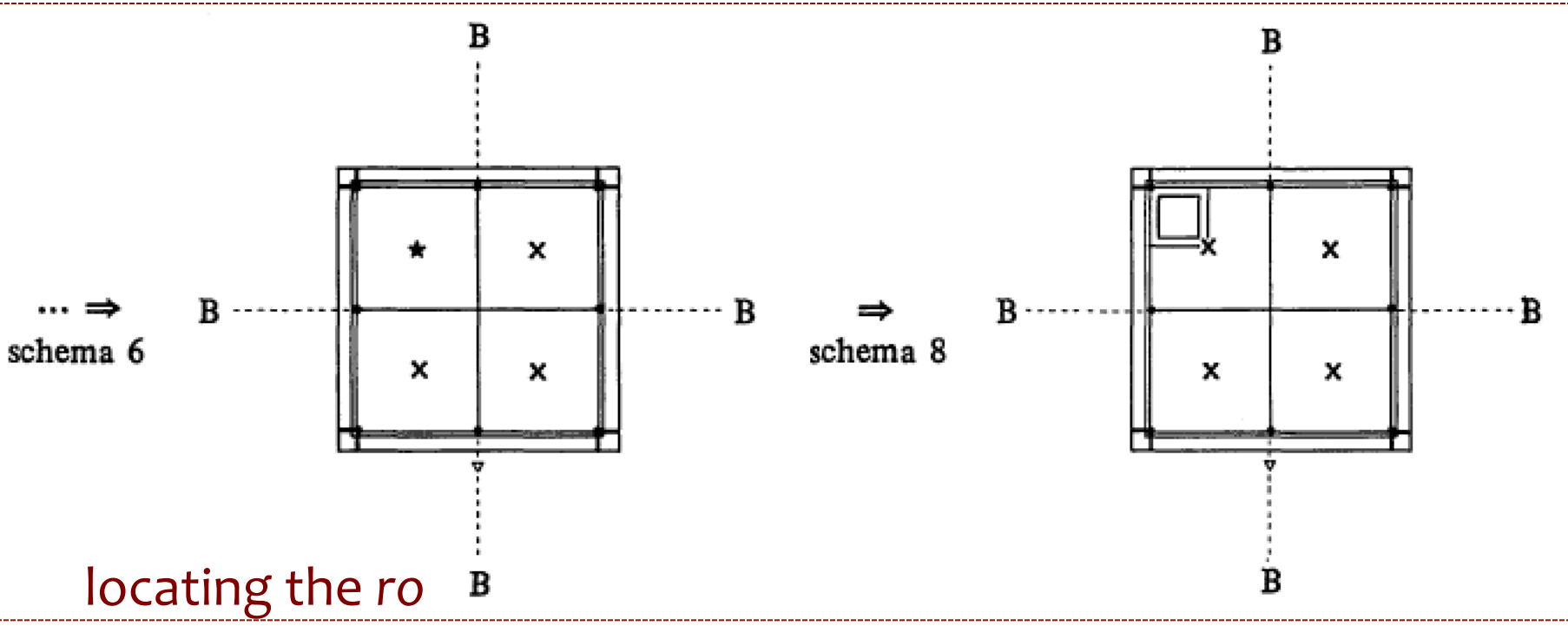
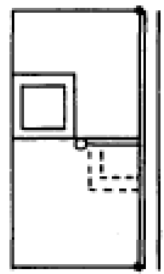
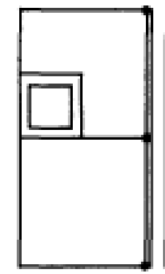
wall placement

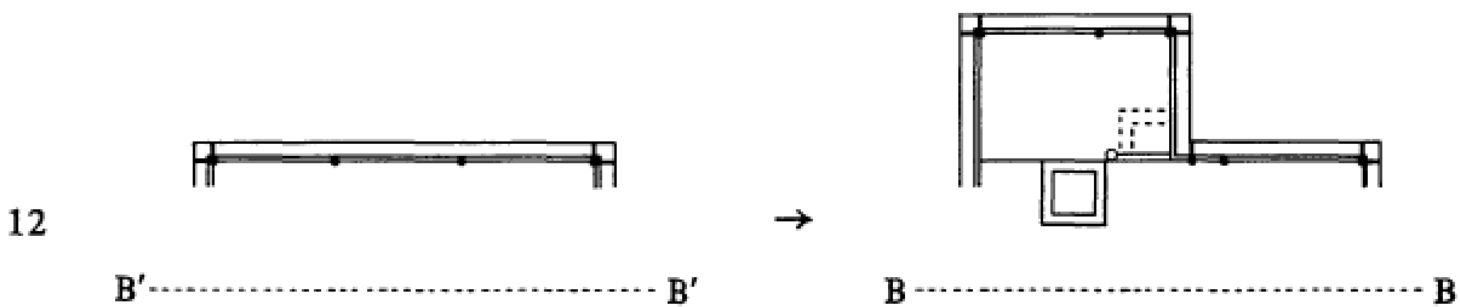
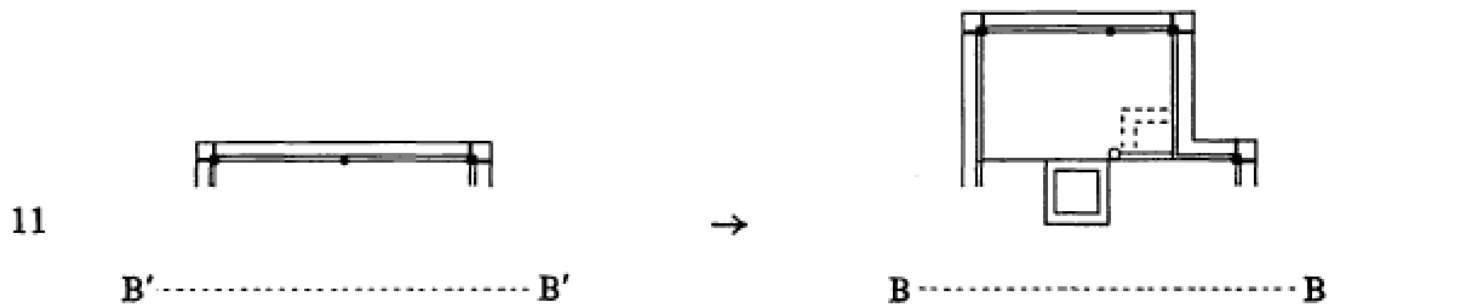
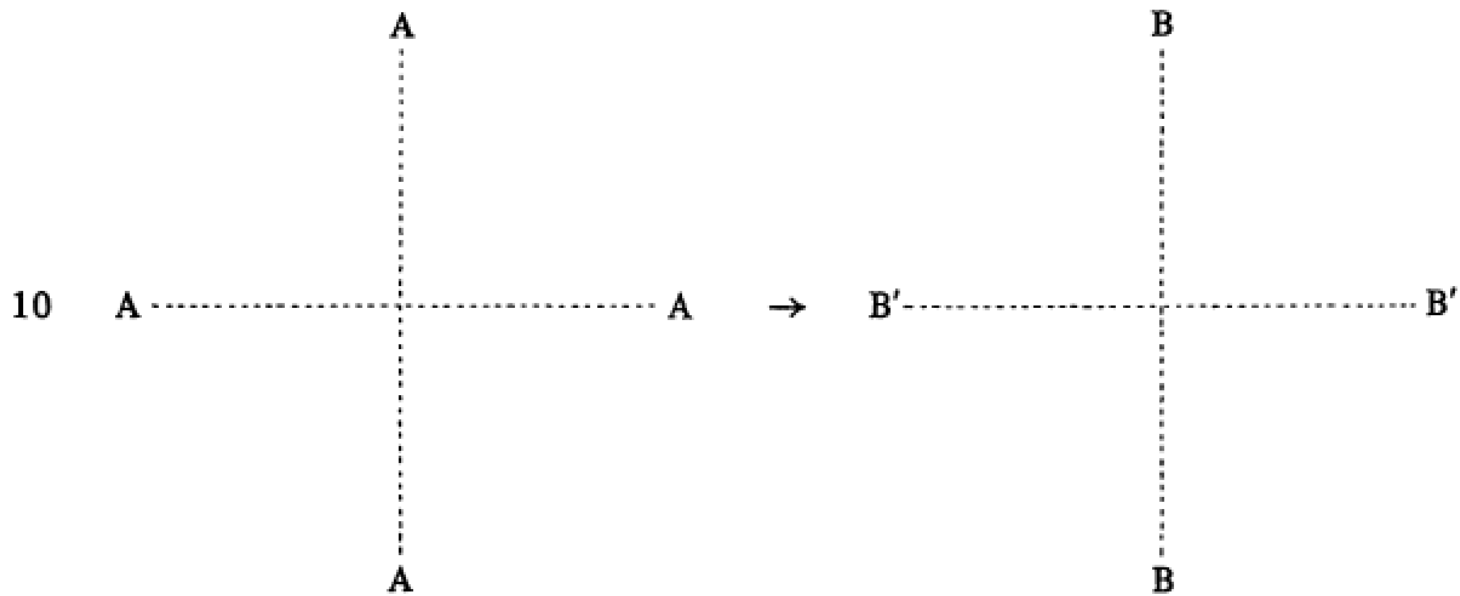


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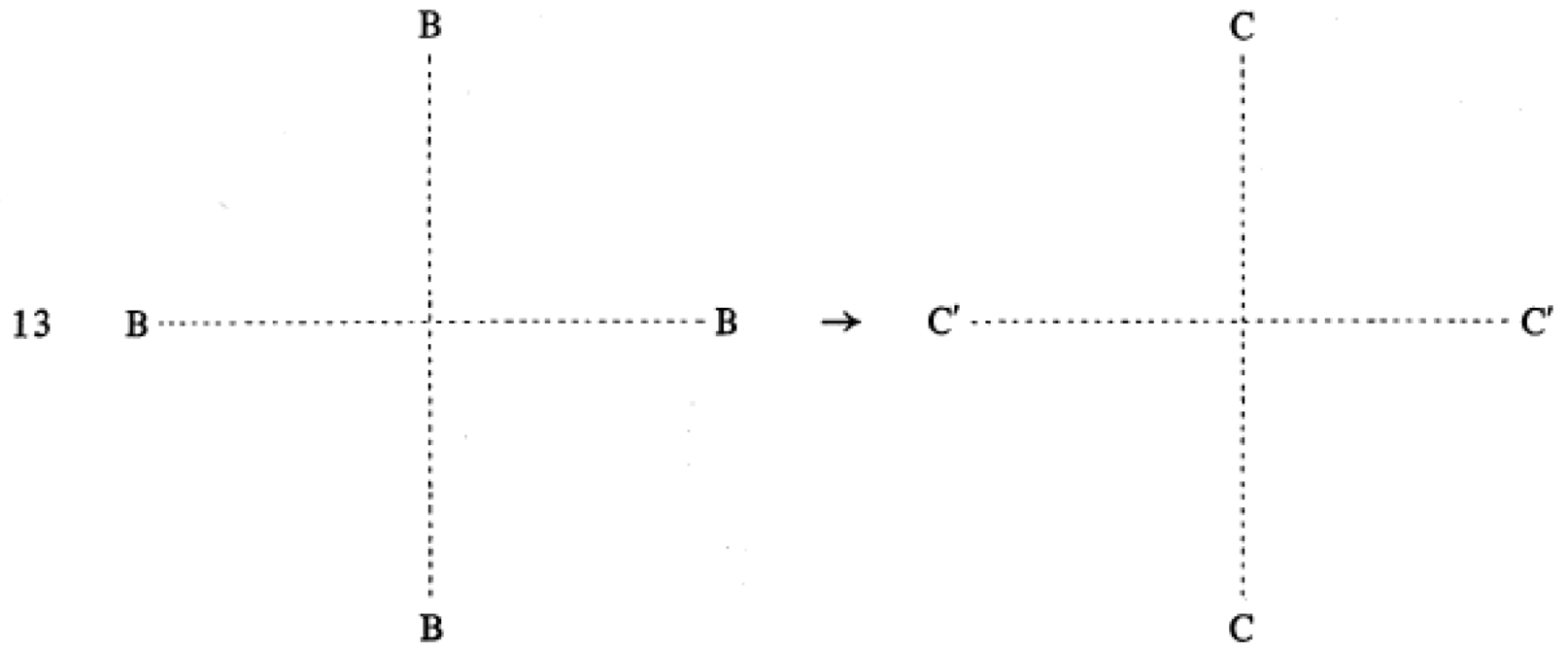
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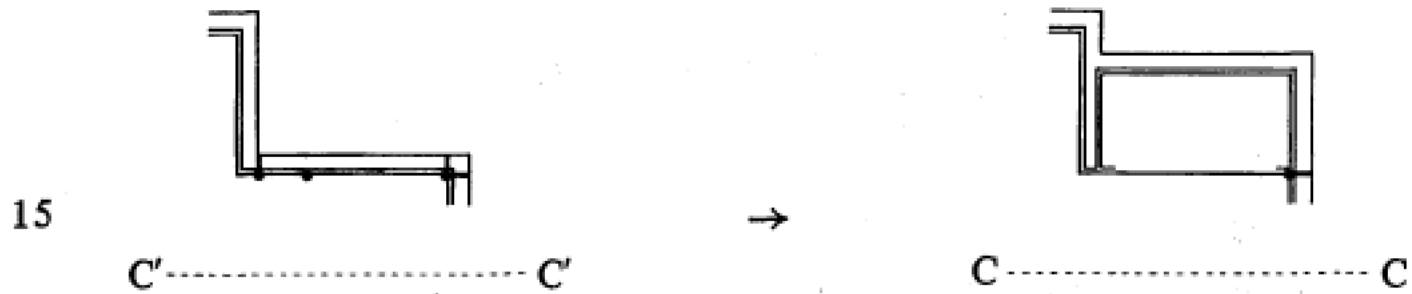
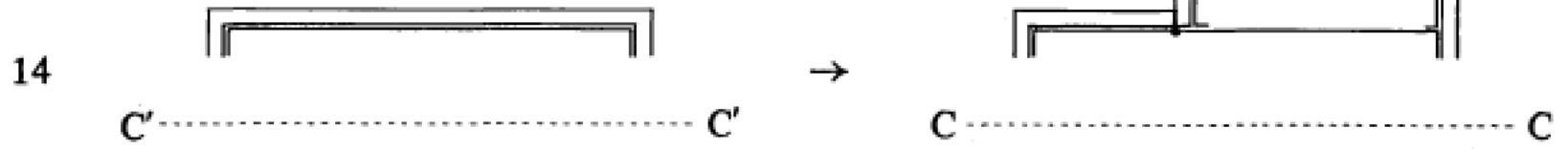


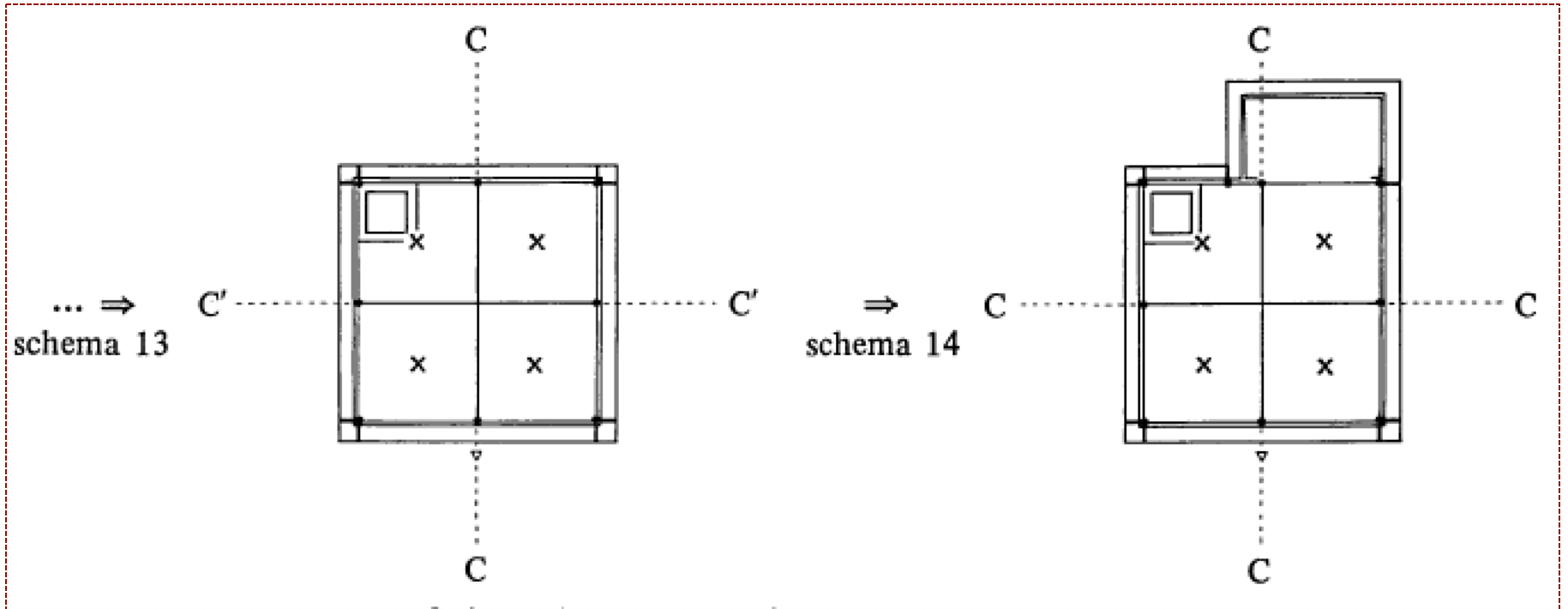
adding a *daime*, *sodekabe*, *nakabashira*, *tana*, and *ro*





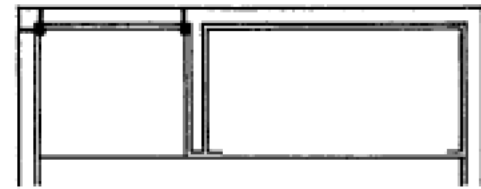
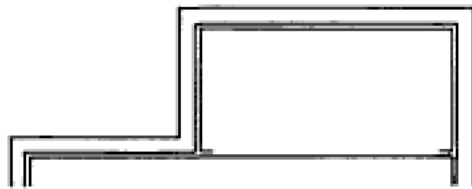
*Adding a tokonomo*



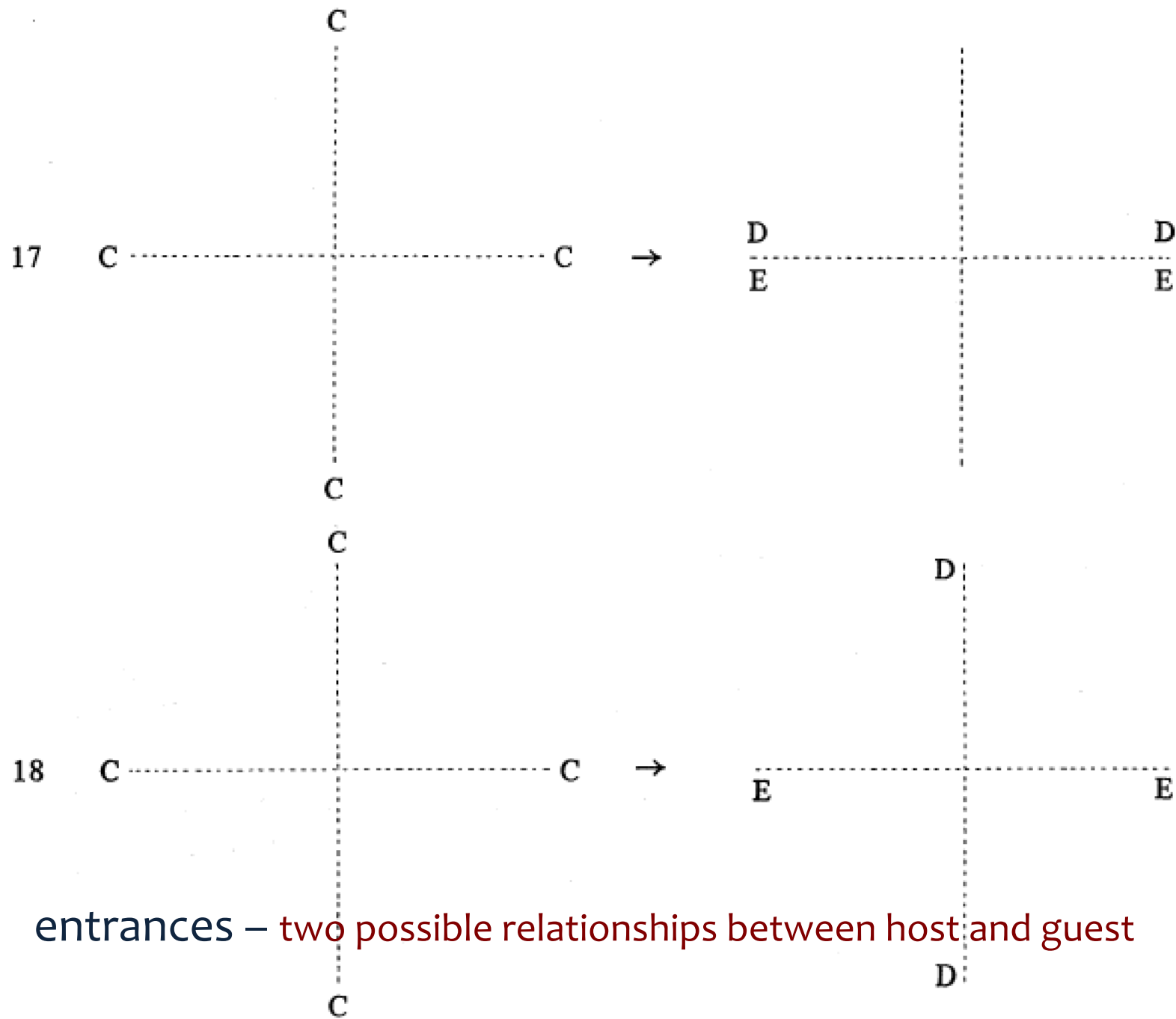


Placement of the *tokonoma* in the *Tai-an* tearoom.

16

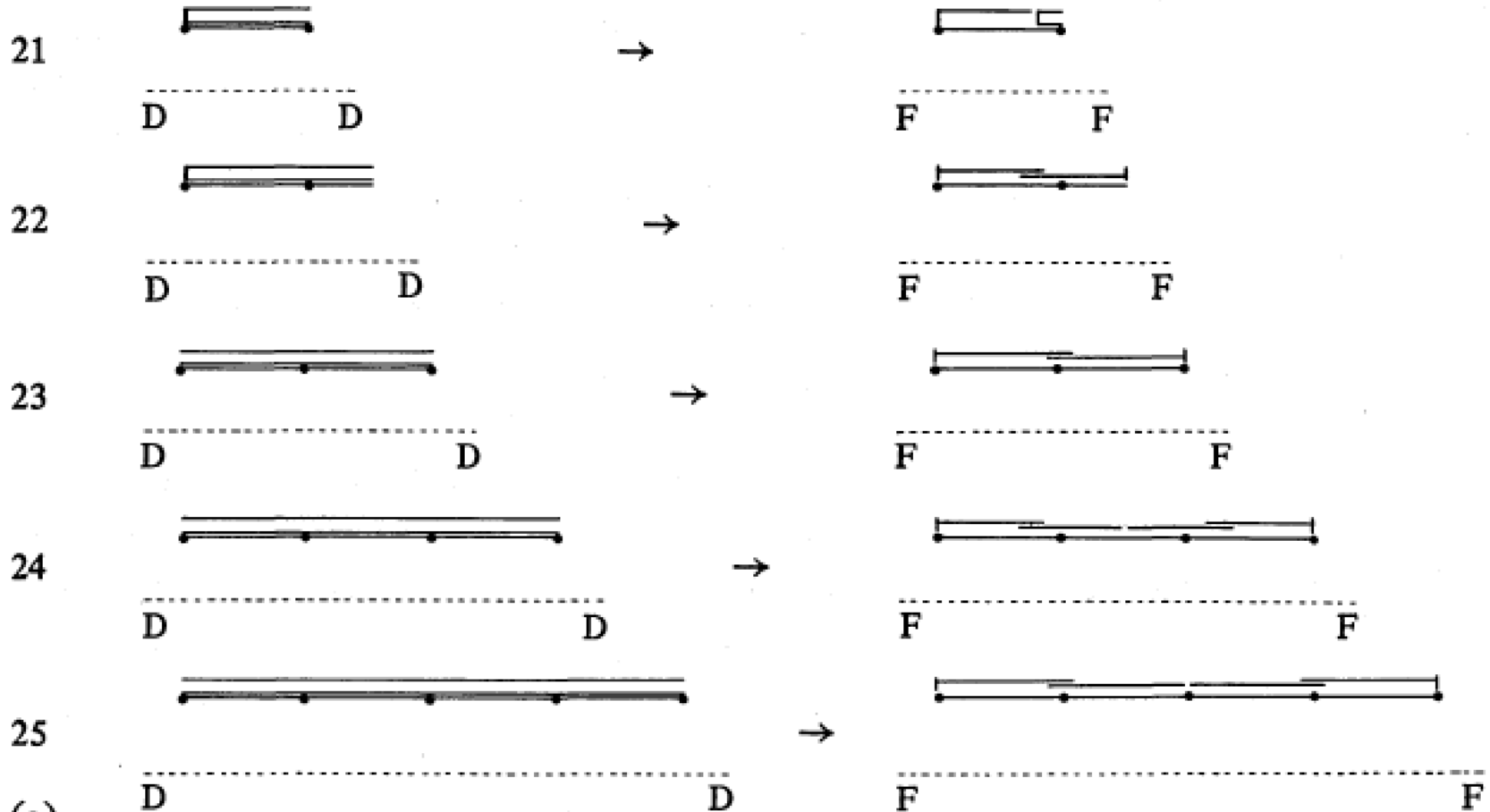


Adding a space adjacent to the *tokonoma*





entrances



(a) host entrances

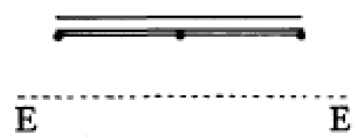
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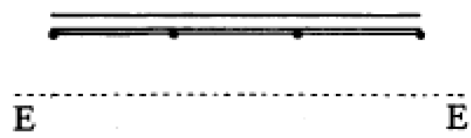
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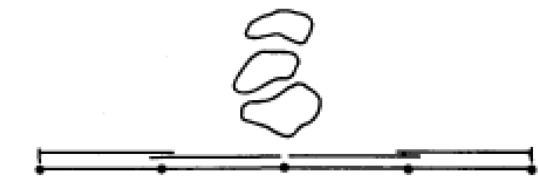
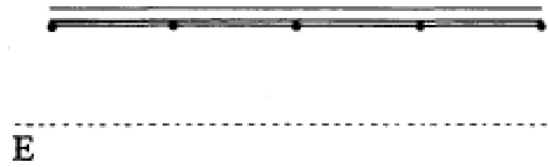


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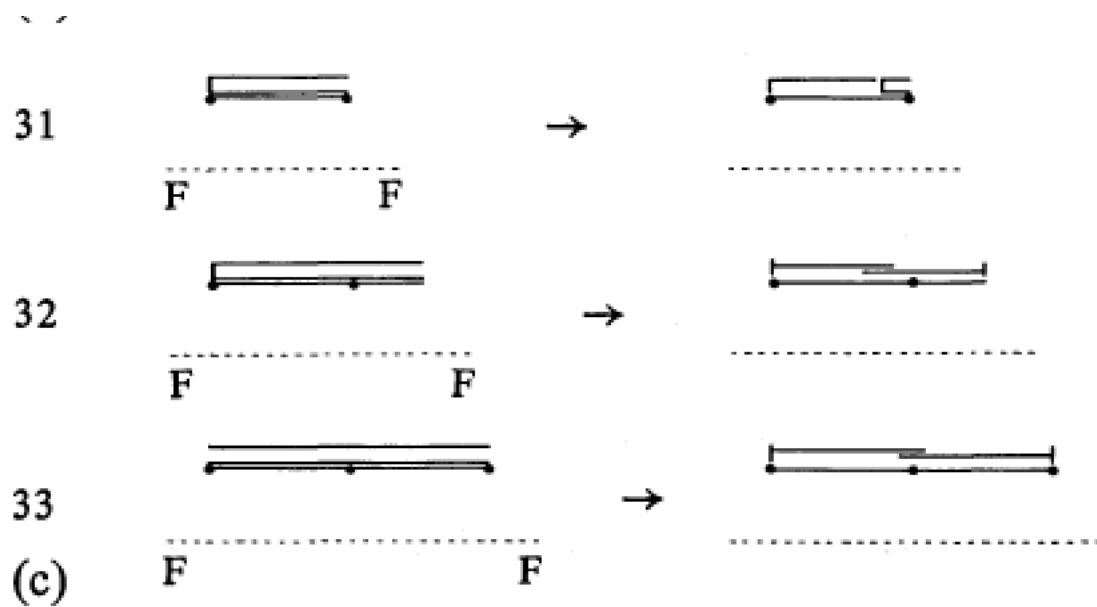


guest entrance

30



(b)



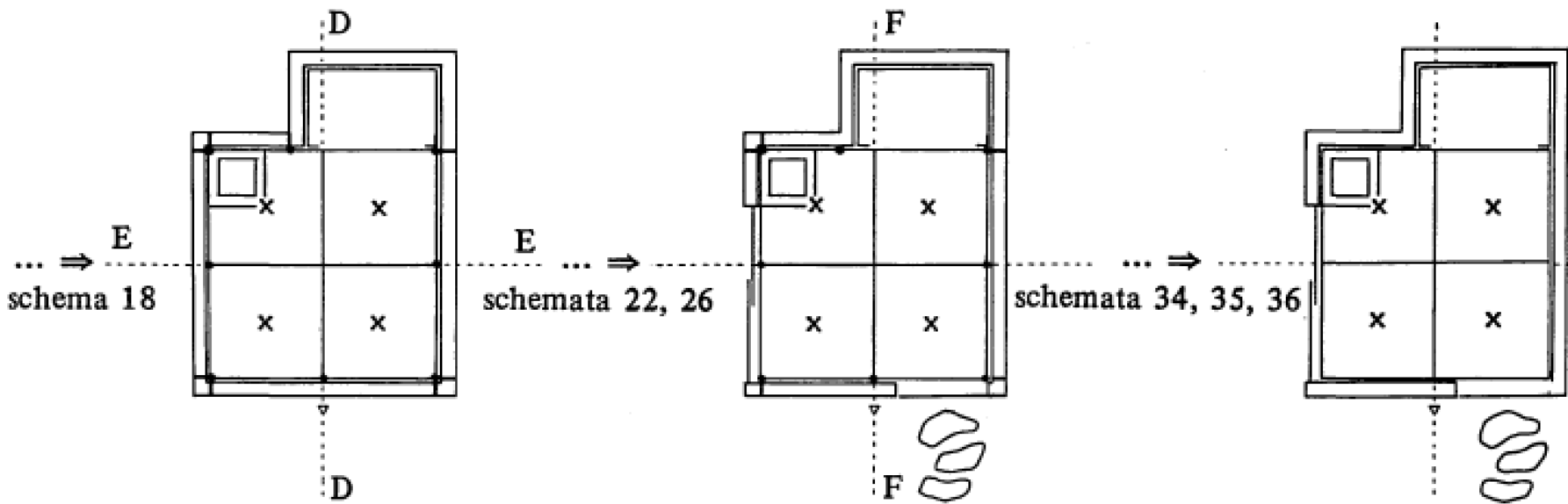
34  $\langle s_\phi, \{(0, 0):F\} \rangle \rightarrow \langle s_\phi, \emptyset \rangle$

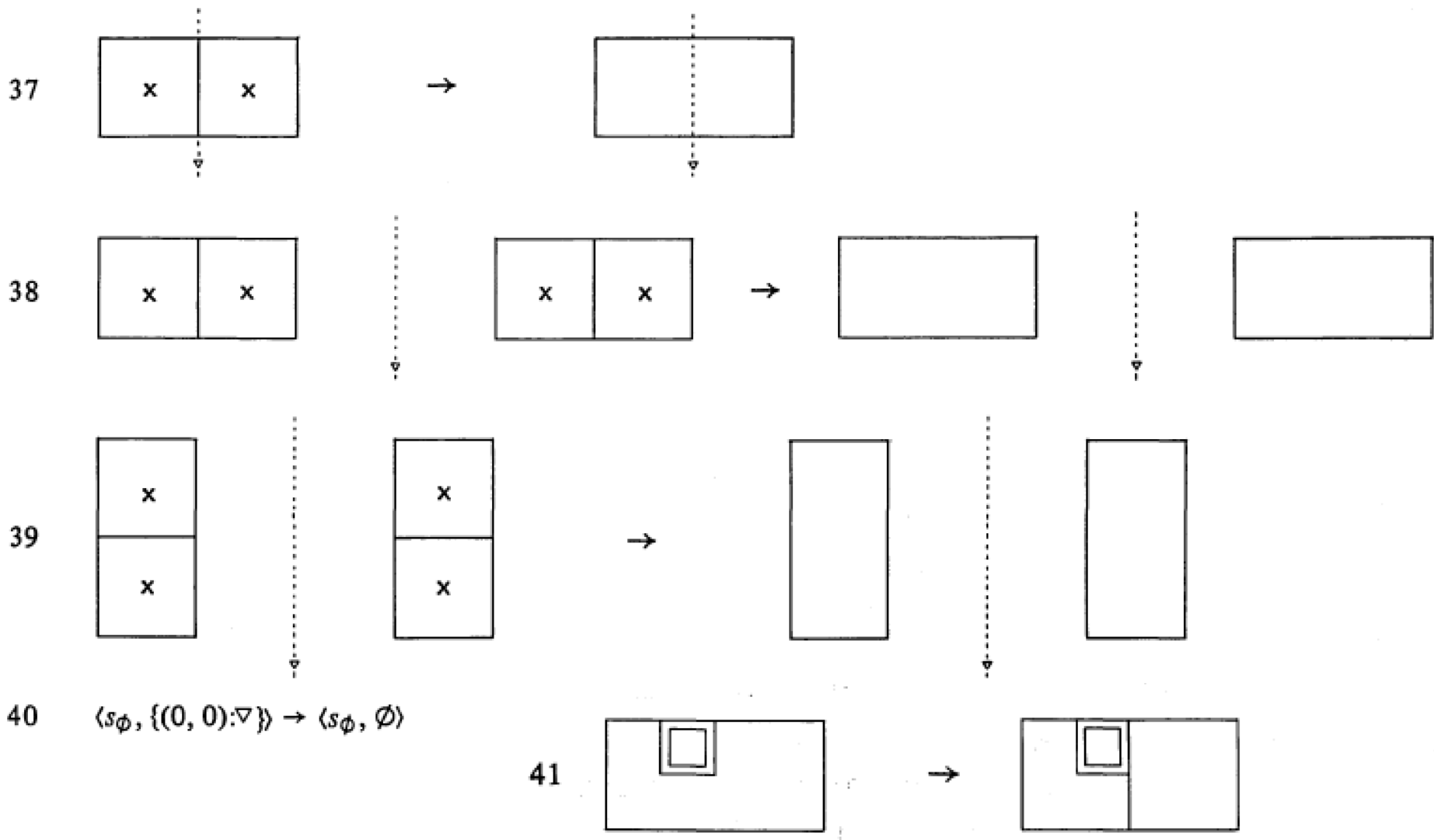
35  $\langle s_\phi, \{(0, 0):\bullet\} \rangle \rightarrow \langle s_\phi, \emptyset \rangle$

36  $\langle s_\phi, \{(0, 0):I\} \rangle \rightarrow \langle s_\phi, \emptyset \rangle$

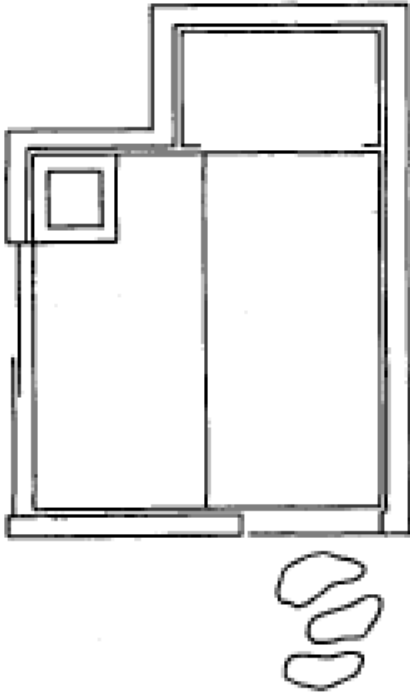
servants entrance & termination







placing *tatami* mats



The *Tai-an* tearoom

A tearoom plan has relatively little complexity.

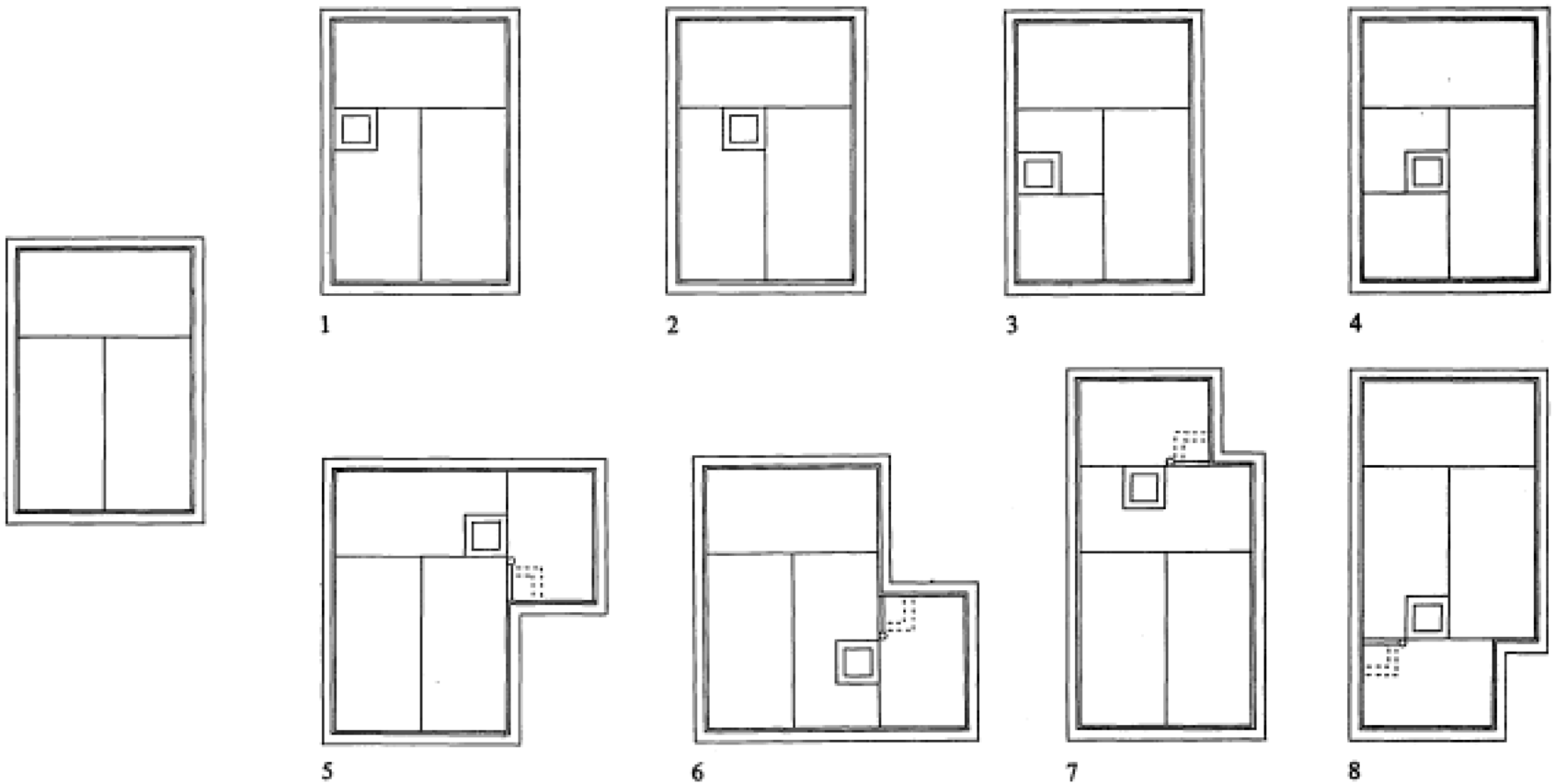
It consists, basically, of a rectangle with variously proportioned rectangles (ro, daime, and tokonoma) added to it.

The mat arrangement within this rectangle usually exhibits the most rudimentary type of symmetry—bilateral symmetry.

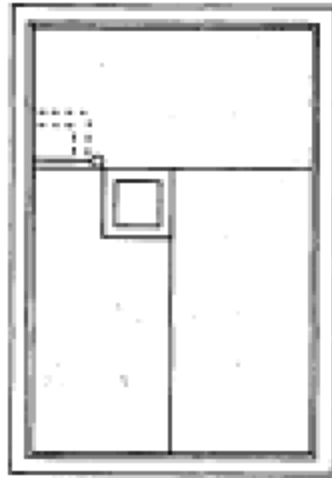
Tearoom plans show only a minimum of variety

By means of a shape grammar, one could quickly and easily enumerate all possible tearoom plans for any standard room size

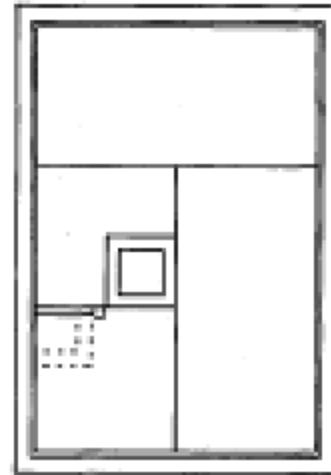
about Japanese Tea rooms



Locating a *ro* in a three-mat room



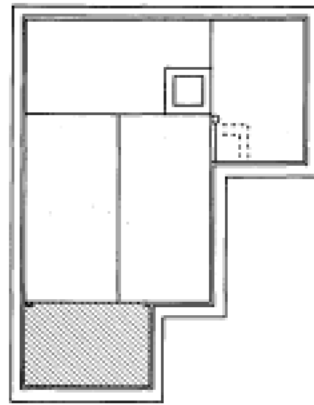
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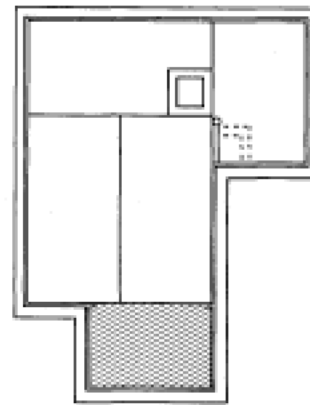
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Locating a *sodekabe*, *nakabashira*, and *tana* in a three-mat room

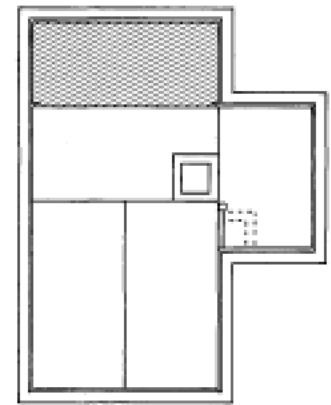
Locating a *tokonoma* in a three-and-three-quarter-mat room.



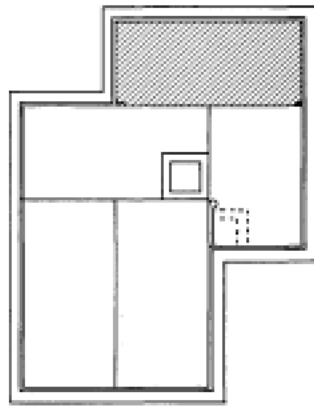
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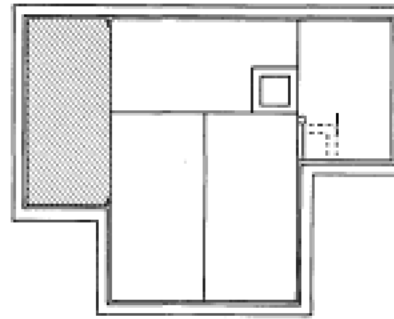
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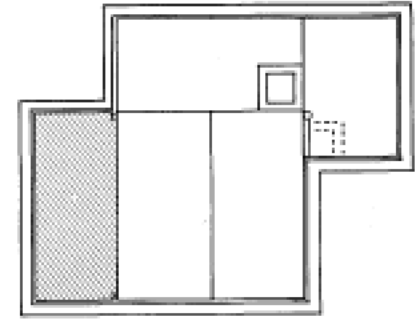
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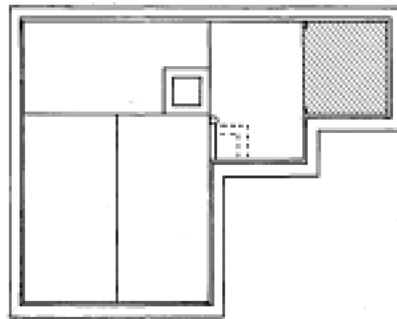
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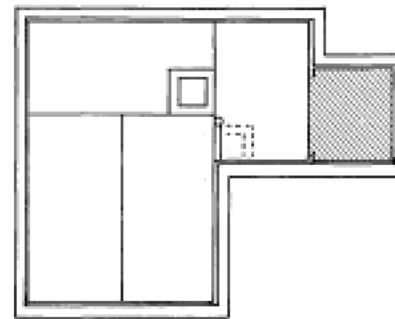
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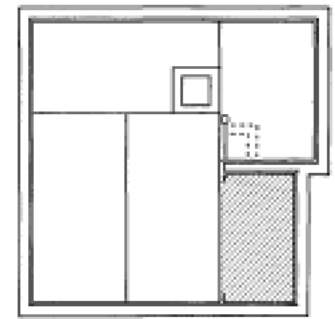
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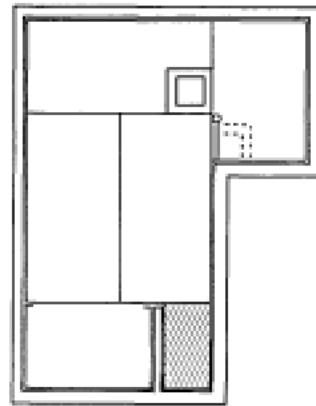
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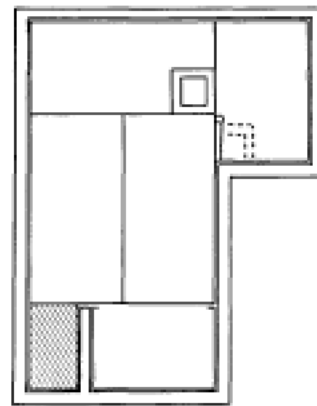
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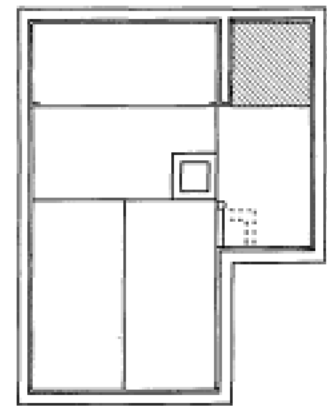
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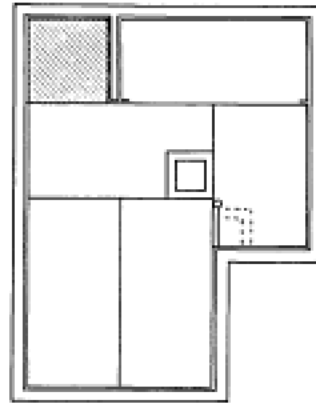
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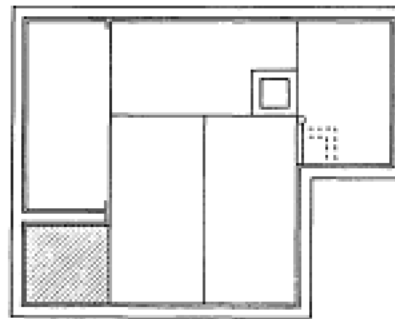
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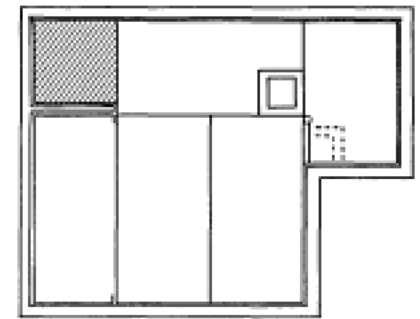
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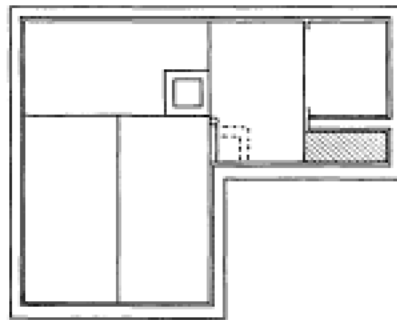
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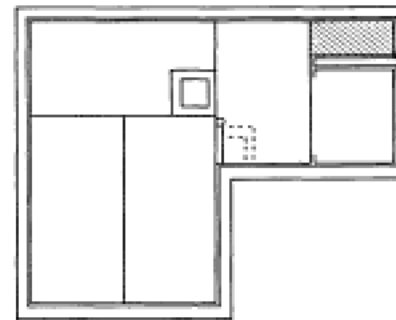
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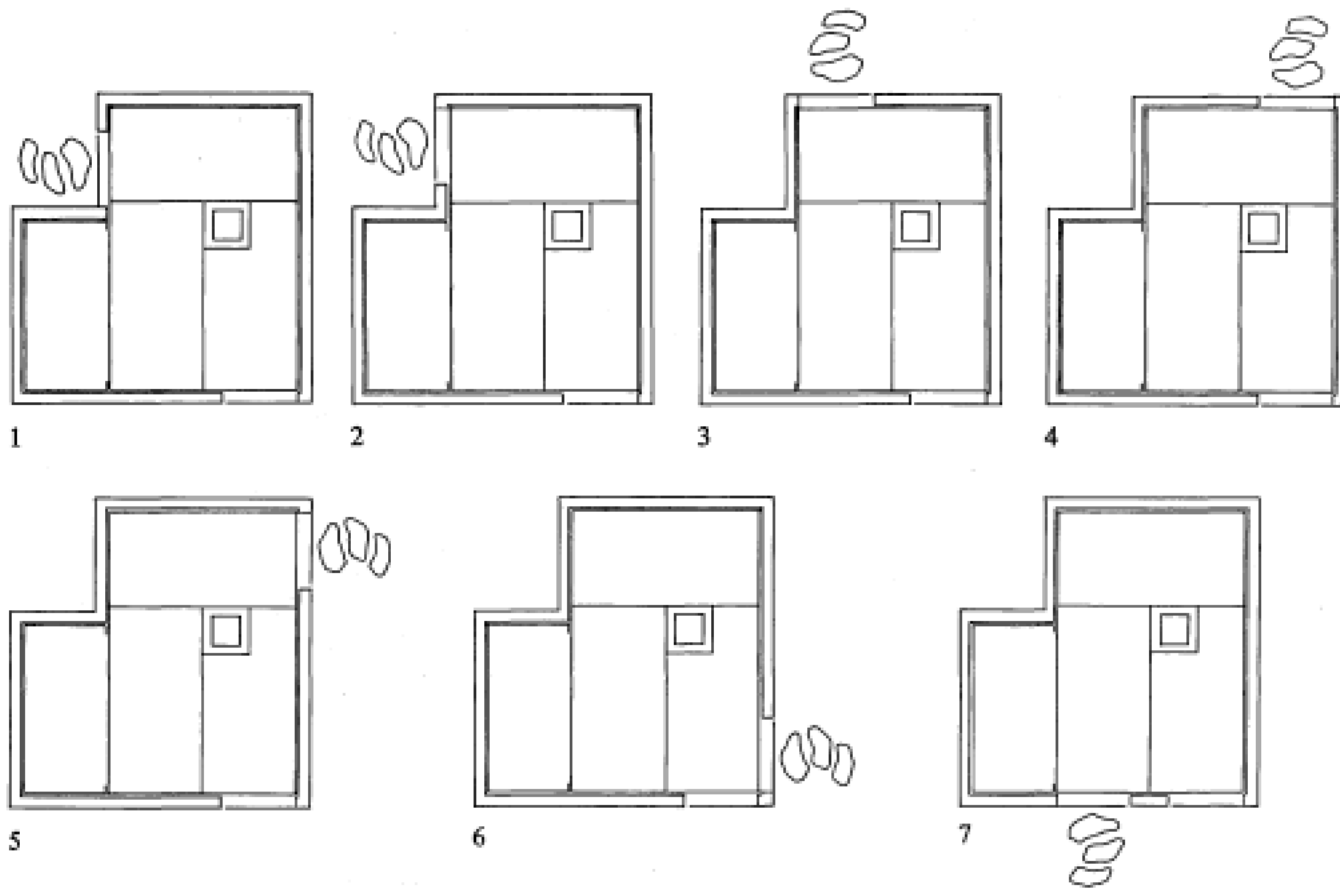
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8

Adding a space adjacent to the *tokonoma*





Locating host and guest entrances

*Simplicity is an integral part of the tea ceremony;* this is certainly reflected in the plan of the room

*The plan is just one element of the design*

The beauty and mystique of a tearoom is derived from the combination of plan, elevations, and decorative effects such as color, texture, lighting, setting, and craftsmanship.

*All these elements contribute towards the proper atmosphere for the tea ceremony*

The Japanese Tea Room