

AN INDUSTRIALIZED COMPONENTS APPROACH  
TO HOTEL BUILDING

BY

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requirements for the degree of  
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Department of Architecture

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Thesis Supervisor

Accepted by.....  
Chairman, Departmental  
Committee on Graduate Students



11 May 1973

Dean William Porter  
School of Architecture and Planning  
Massachusetts Institute of Technology

Dear Dean Porter:

In partial fulfillment of the requirements for the  
degree of Master of Architecture, Advanced Studies,  
I hereby submit this thesis entitled AN INDUSTRIALIZED  
COMPONENTS APPROACH TO HOTEL CONSTRUCTION.

Respectfully,

Emmanuel Tripodakis

11 May 1973

Institute Archivist  
Massachusetts Institute  
of Technology

Dear Sir:

This is to acknowledge that the drawings of this thesis do not conform to the standard format set by the Institute.

The author assumes all responsibility for any damages occurring during the binding process.

Yours truly,

Emmanuel Tripodakis

Thesis Supervisor

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Department of Architecture, M.I.T.

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## ABSTRACT

The aim of this study is to develop a hotel construction system using precast concrete components.

The emphasis of the study is placed on the concrete, box type, "bathroom units" which are produced in the factory and subsequently shipped to the site thus achieving obvious reduction in specialized labor requirements as well as construction time.

The first part of the thesis describes the local conditions that initiated and influenced the development of this idea and then proceeds to the description of the proposal.

In the second part the design proposal is explained through drawings illustrating basic plan layouts, proposed bath units, assembly sequence, structural details, alternative layouts, etc.

## INTRODUCTION

The rapidly expanding tourist industry in Greece over the last years accounts for a steadily increasing demand in hotel accommodation of all categories. The rate of growth of tourism constantly surpasses that of new hotel building, and conventional construction methods seem to be unable to meet the requirements for very short construction time of this booming industry. Moreover conventional construction practices have been plagued by rising labor costs and problems of unavailability of skilled labor in locations somewhat removed from densely populated urban areas as often is the case with tourist installations. Significantly enough hotel construction was one of the very first areas in the Greek building industry where prefabrication methods were applied.

The purpose of this study is to develop a hotel building system using industrialized components as a partial solution to the aforementioned problems.

## DESCRIPTION OF SYSTEM

The aim of the present proposal was the development of a hotel construction system using precast concrete components. These industrialized components could be produced either in the factory or at the site.

Reinforced concrete was selected as structural material for being by far the cheapest building material available in Greece and also the most widely used and familiar.

Two types of structural systems are proposed:

- 1) Precast columns, beams, and room size slabs also forming the balconies. The room dividing walls are non-bearing made out of porous lightweight concrete or possibly other materials.
- 2) Precast concrete bearing walls (room dividing) and room size slabs.

In both systems concrete box type bathroom units are used which will be extensively described later on. These units become integral parts of the general structure contributing largely to the stringent building earthquake specifications which are required.

In both cases the structure supporting the first floor is formed out of poured-in-place concrete believed to be the

most practical way at the present stage for meeting the ground floor requirements in terms of various architectural layouts and widely different topographies. This type of continuous poured-in-place structural frame also contributes greatly to the overall rigidity of the building. The system has been studied for application to buildings up to ten stories high.

Starting from the realization that bathroom interior finishing, fixture installing, plumbing, etc. required a great deal of on site skilled labor and also accounted for a sizeable percentage of the total construction time, it was felt that significant results could be achieved by transferring those operations from the site to the factory.

Thus the bathroom box type precast concrete unit was conceived comprising two adjacent bathrooms divided by the same utilities chase. These units can be completely factory finished including installation of all fixtures, mirrors, tiles, hung ceiling, doors, etc. Furthermore individual room air conditioning units can be installed at the factory in the space over the hung ceiling of the unit and achieve this way greater efficiency in transportation and further reduction of on site installation costs.

A variety of bathroom unit types has been developed in

compliance with the minimum width and square footage requirements for A, B, and C category hotels of the Greek National Tourist Organization.

Some types of vertical circulation areas are proposed ranging in width from two to four room modules. Also included in the study are some hotel layout variations including L shaped or staggered configurations. Possible facade configurations with the use mainly of precast concrete components were also examined.

#### Mechanical System

As mentioned previously heating and air conditioning is individually available to each room through the use of fan coil units placed in the adjacent bathroom unit.

This configuration has the advantage of eliminating extensive ductwork save for the length from the unit to the room wall in addition to providing greater flexibility to the contractor allowing for installation of individual units at a later stage if so required.

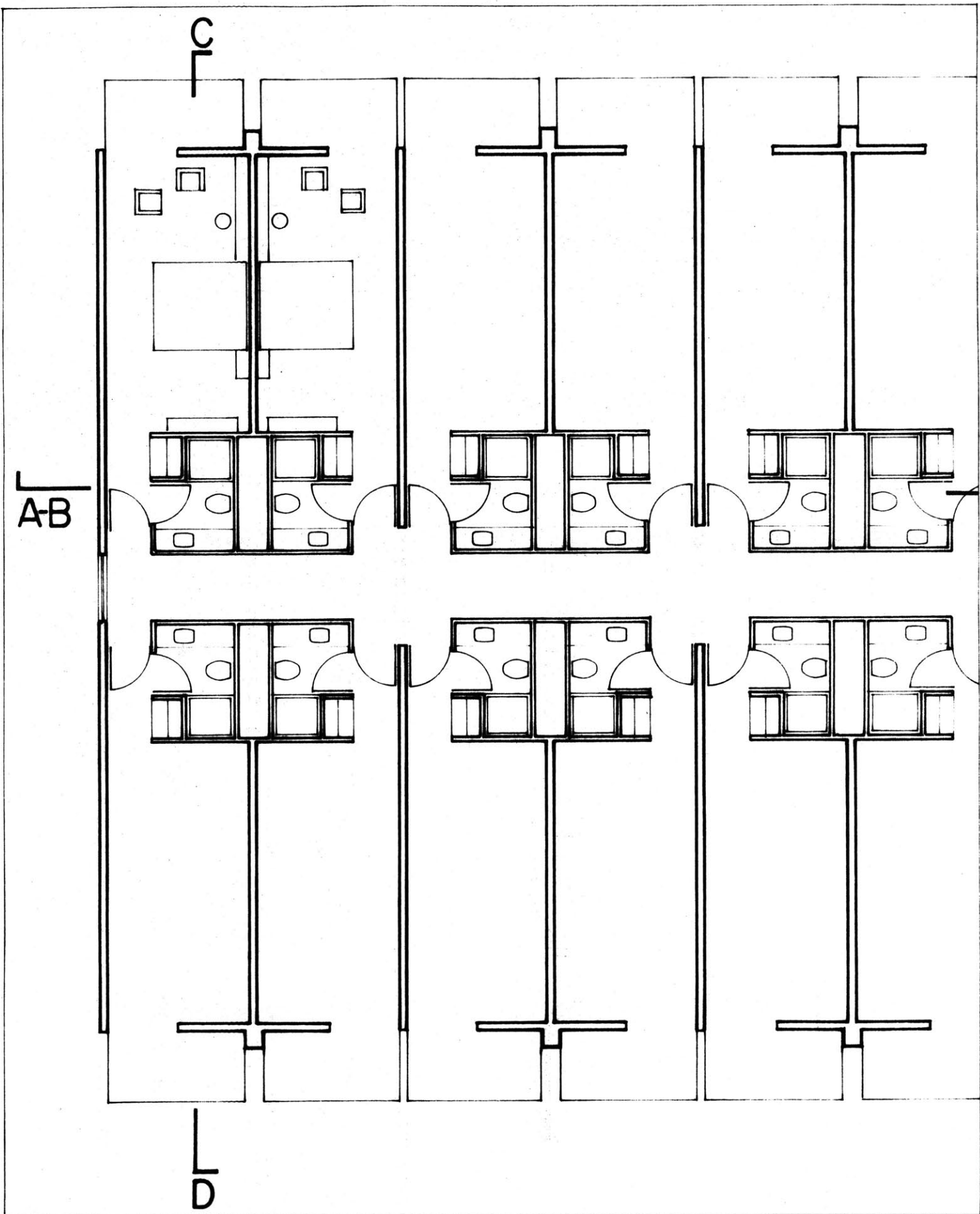
Access to the units is provided through removal of the snap-on type bathroom ceiling elements.

Bathrooms are naturally ventilated through the utilities chase with the possible assistance of an extractor type fan.

All pipes and electrical conduits are run through these utilities chases and are directly accessible through openings from the corridor for ease of maintenance and repair work.

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8. Thomas Schmid and Carlo Testa. SYSTEMS BUILDING
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TYPICAL HOTEL LAYOUT

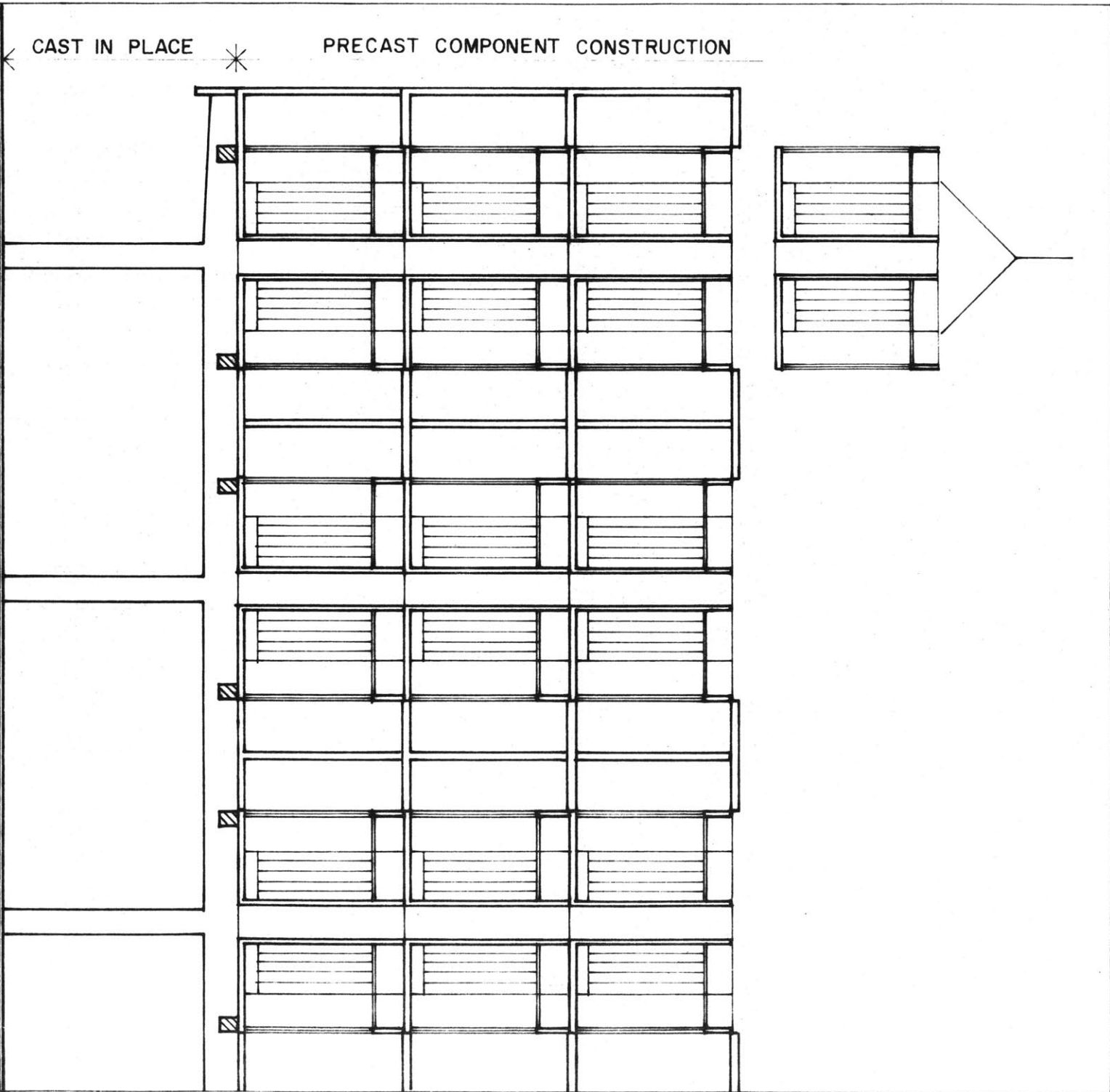
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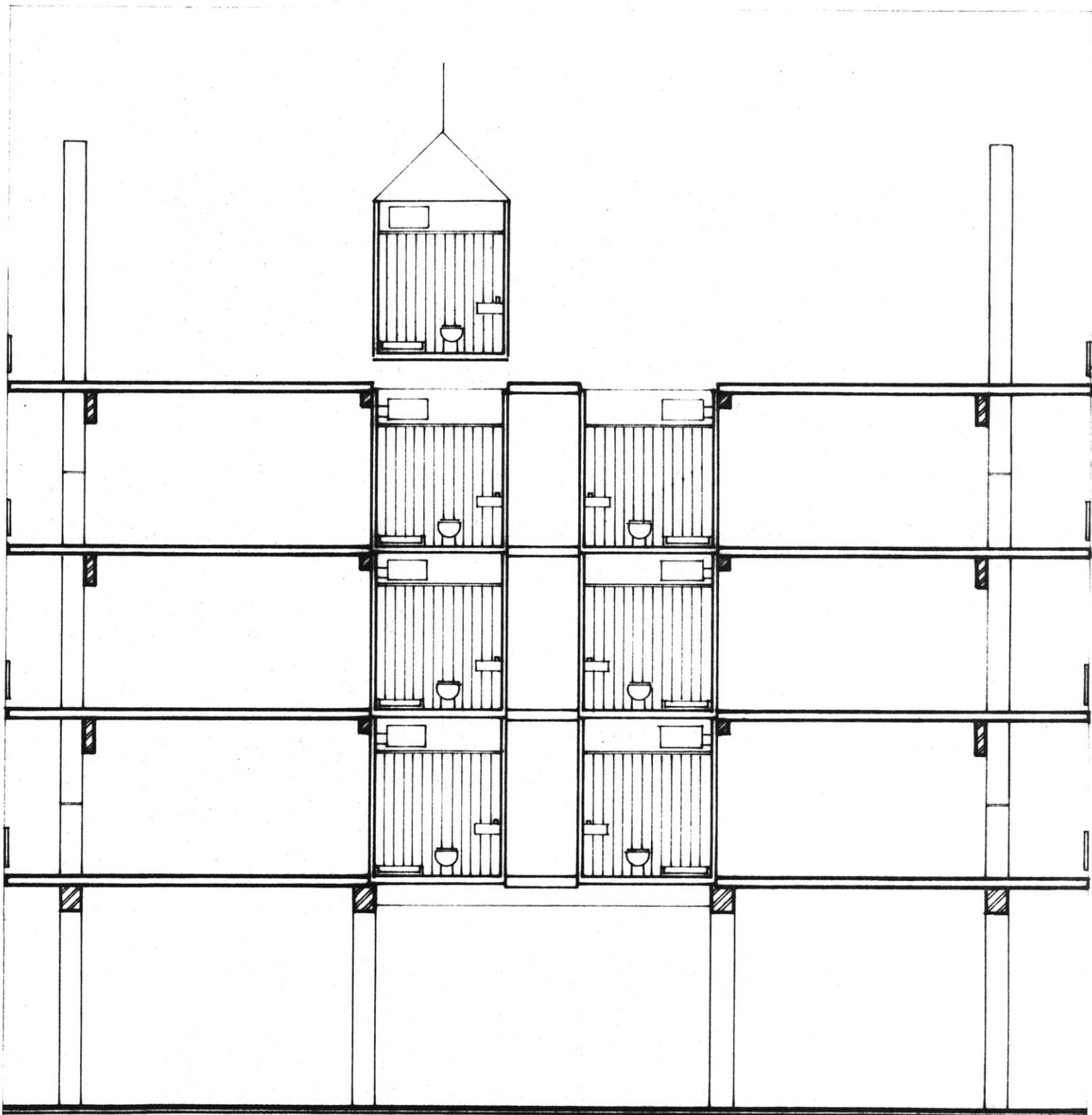
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SECTION A-B

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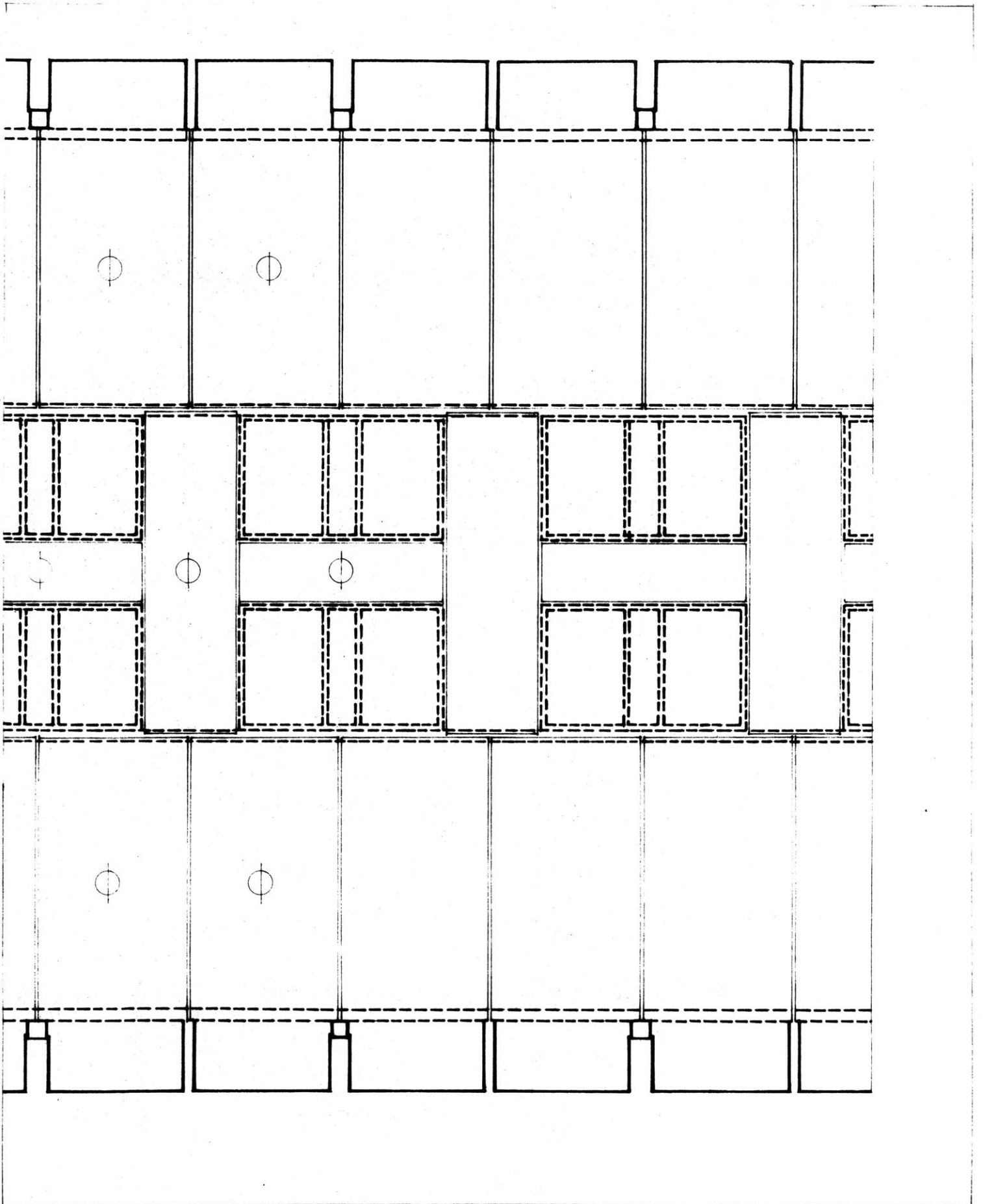
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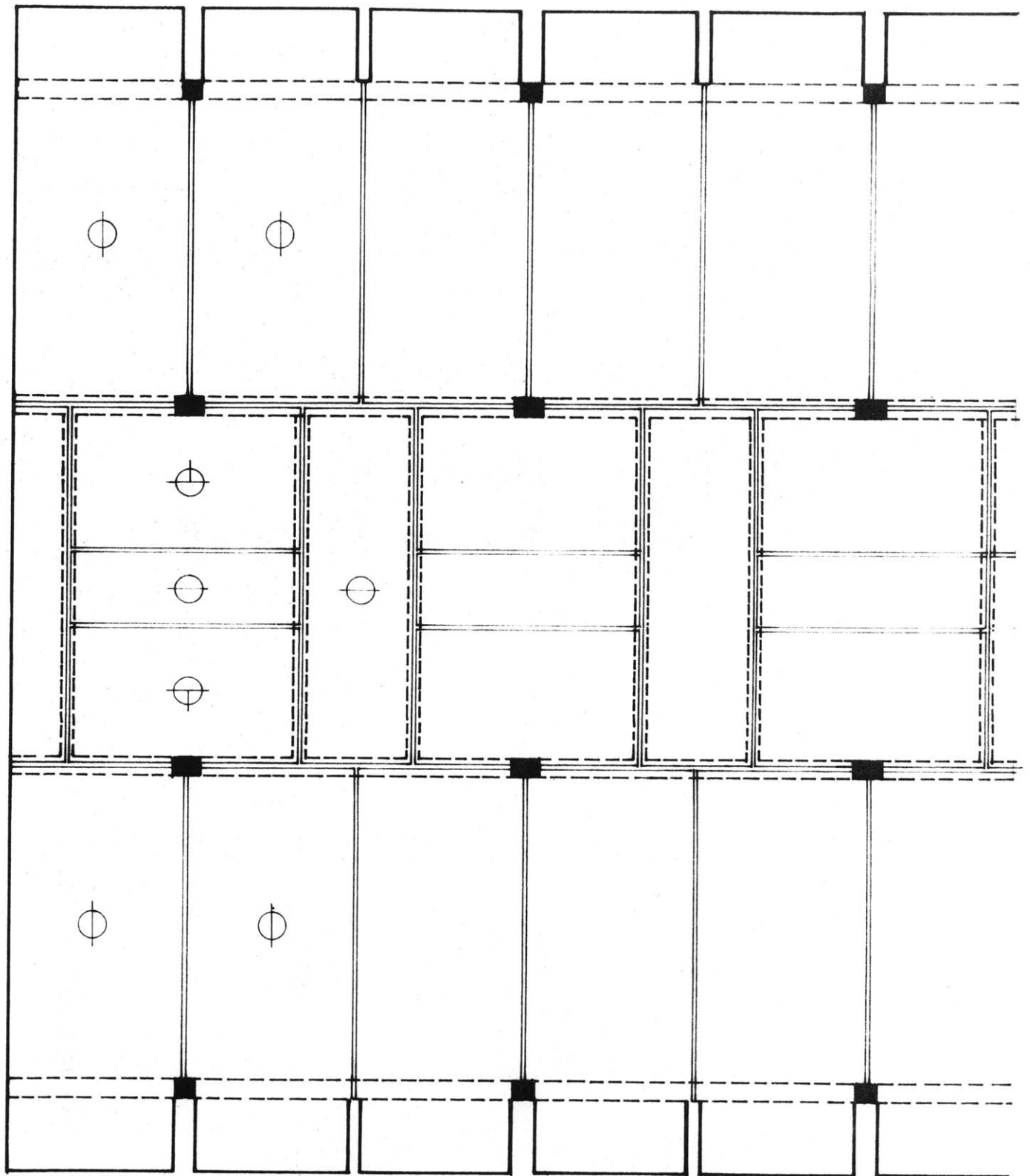
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SECTION C-D



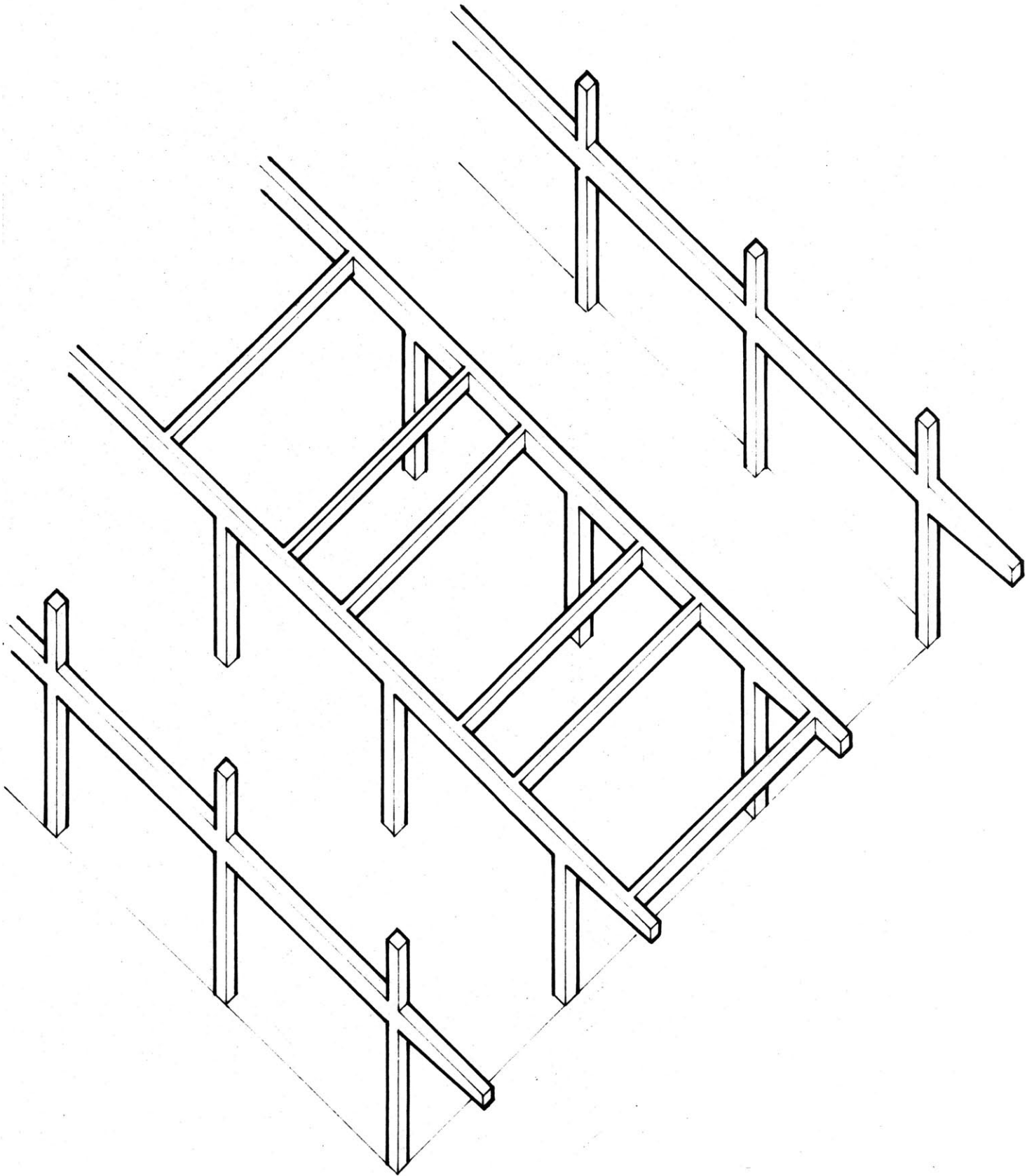
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STRUCTURE

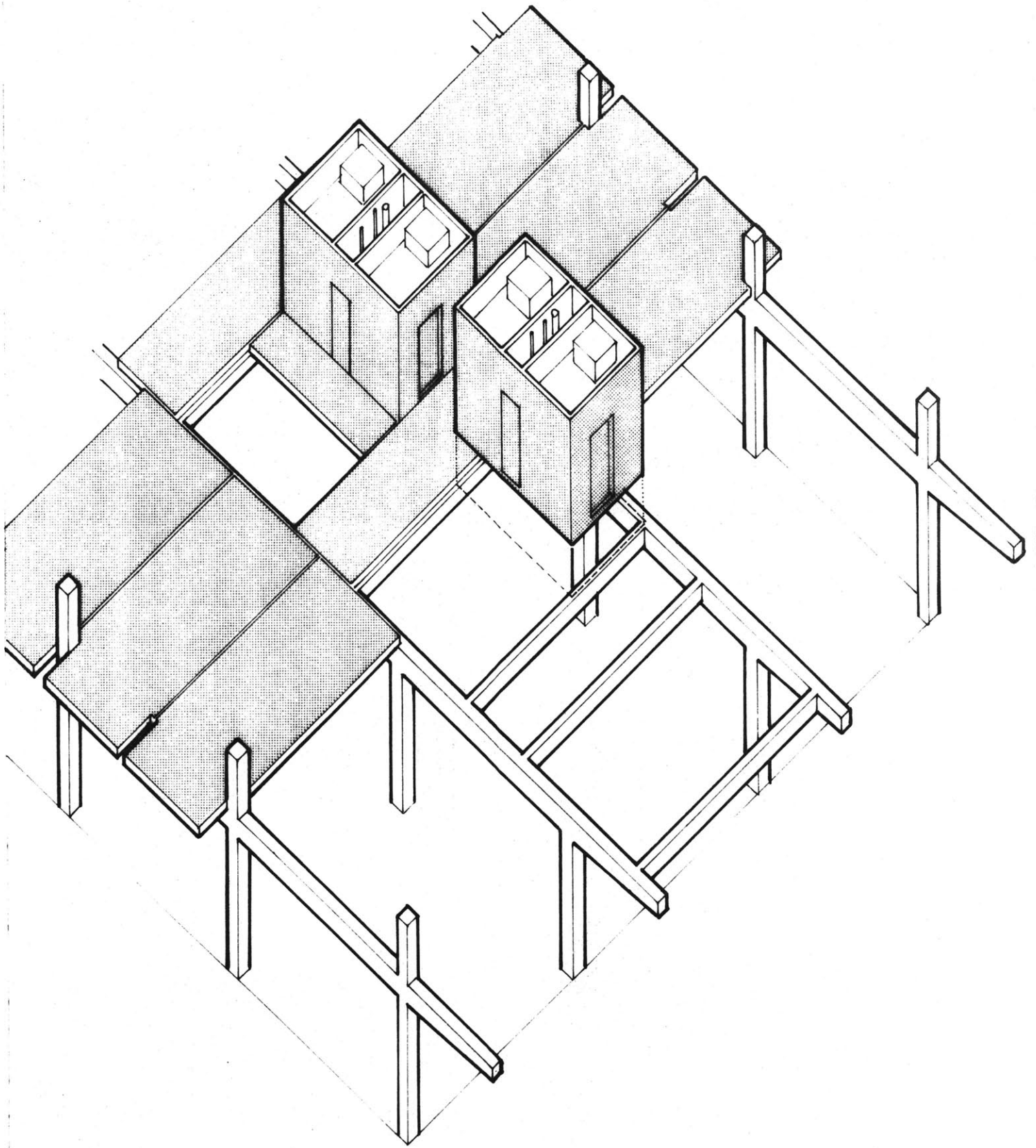


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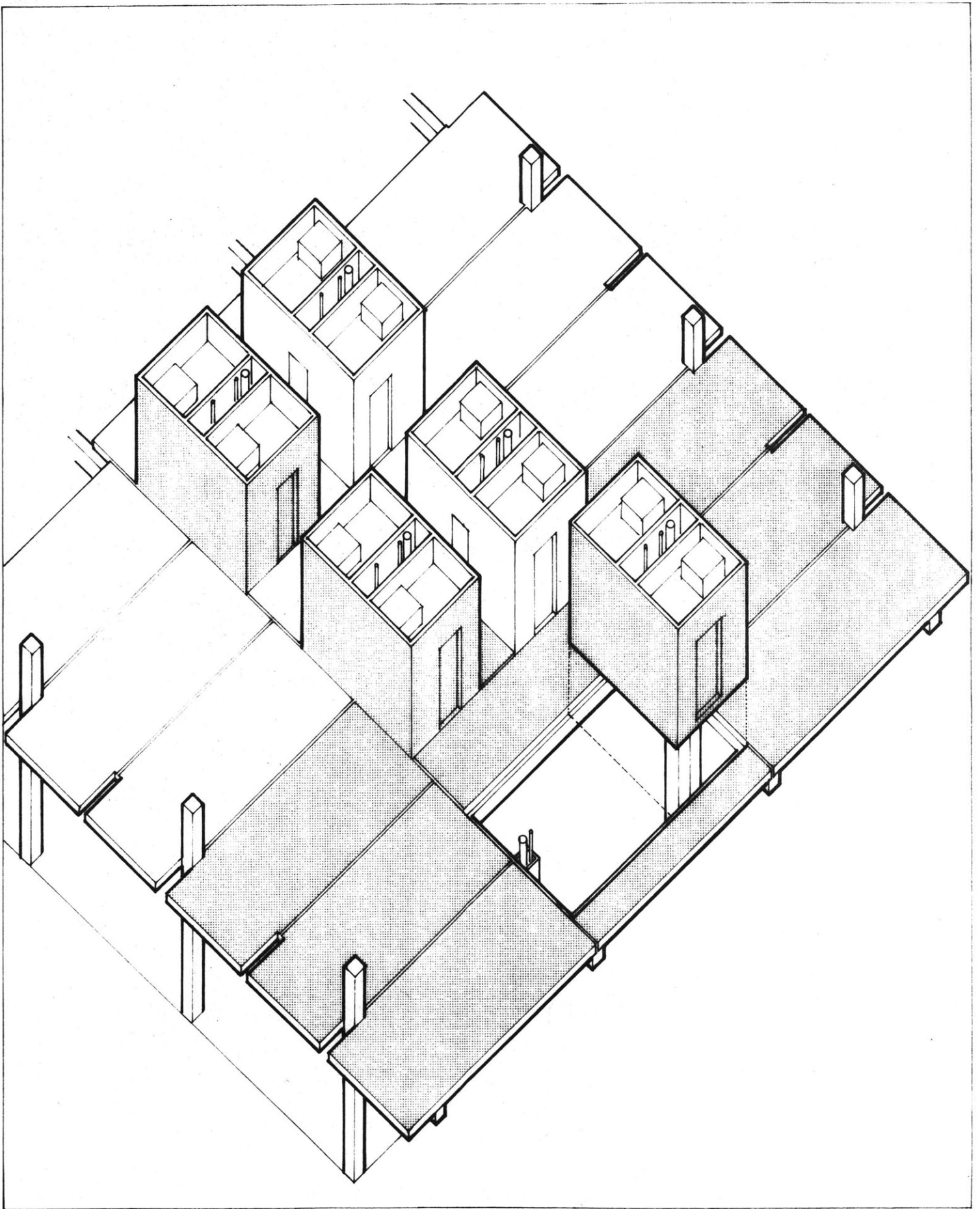
GROUND FLOOR STRUCTURE



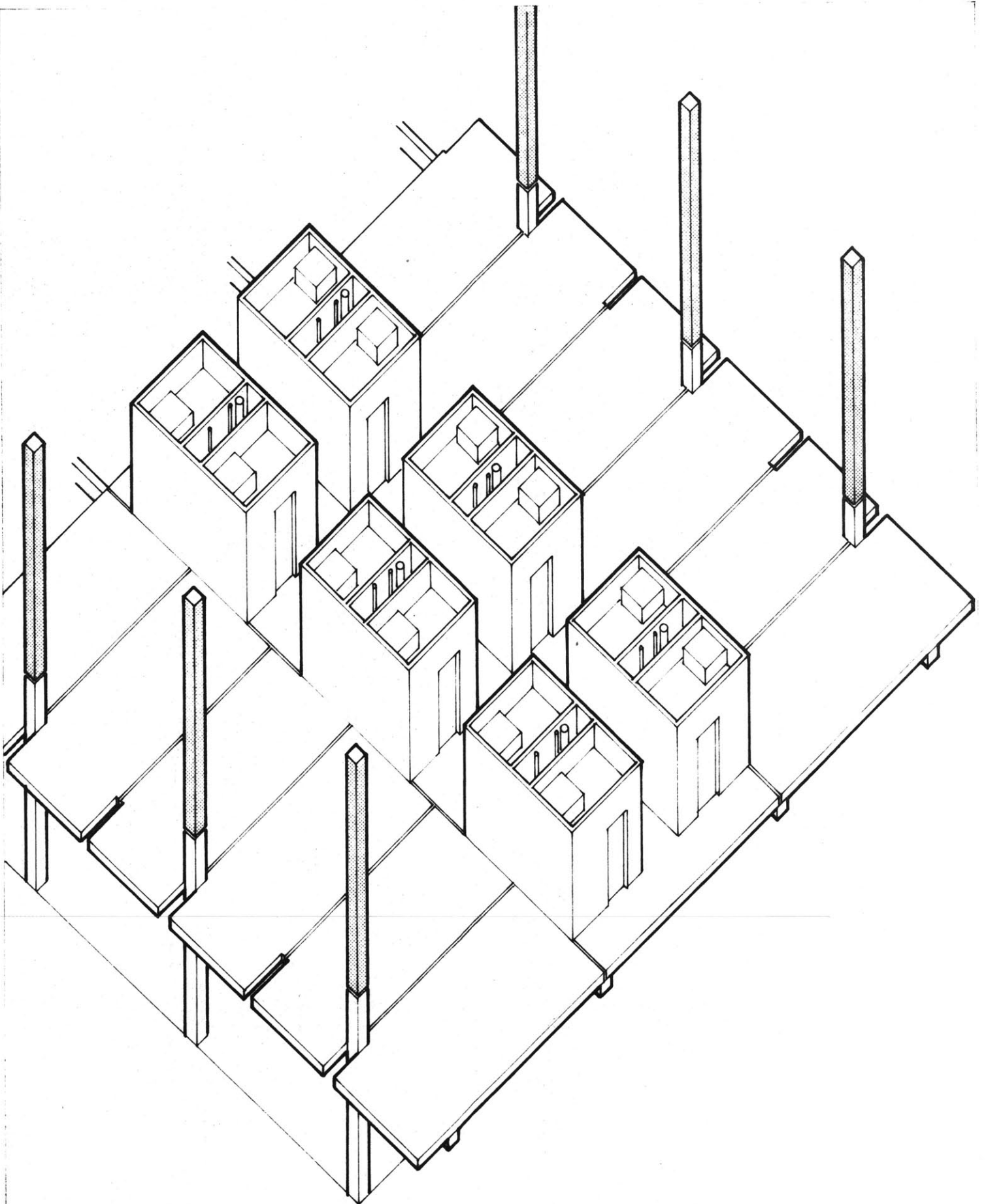
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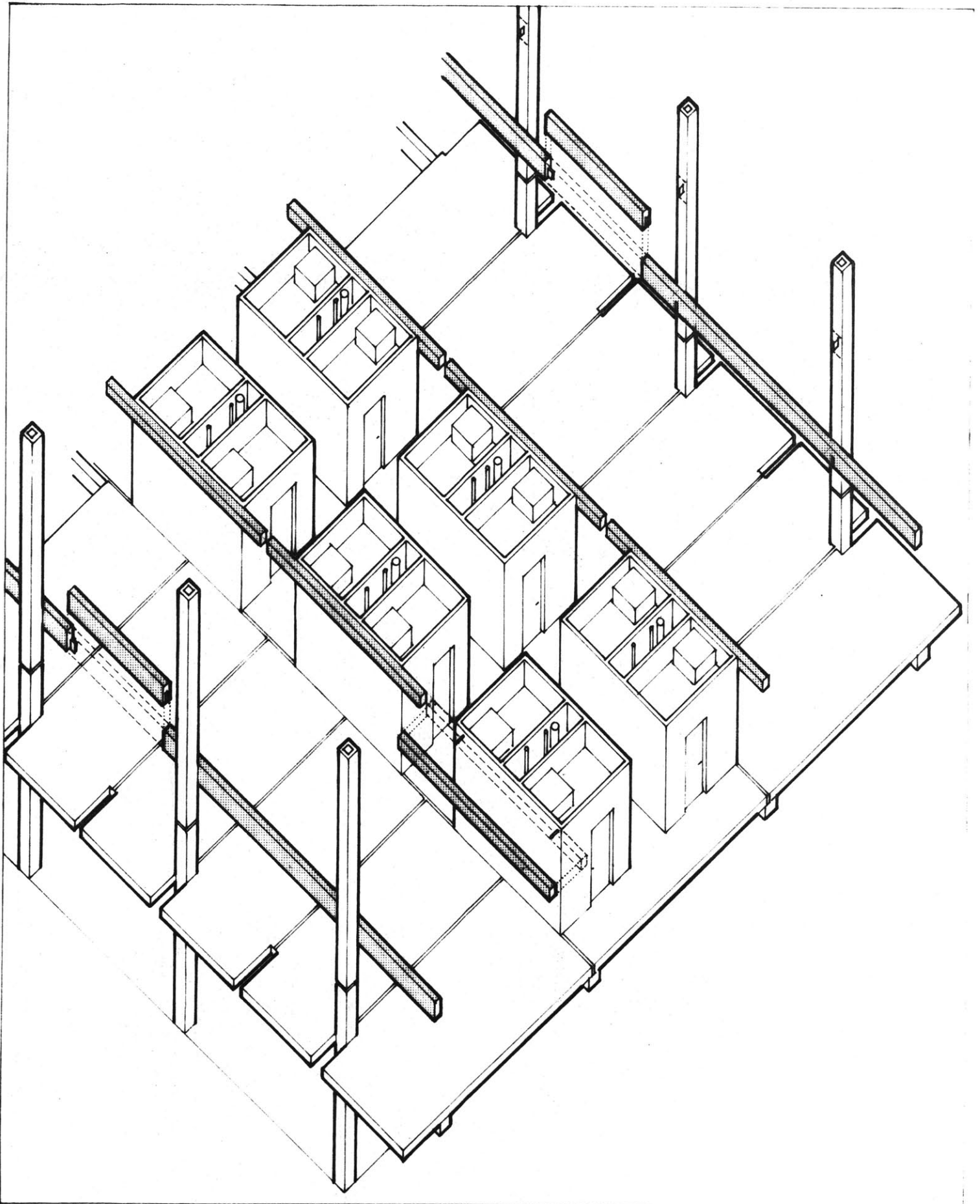
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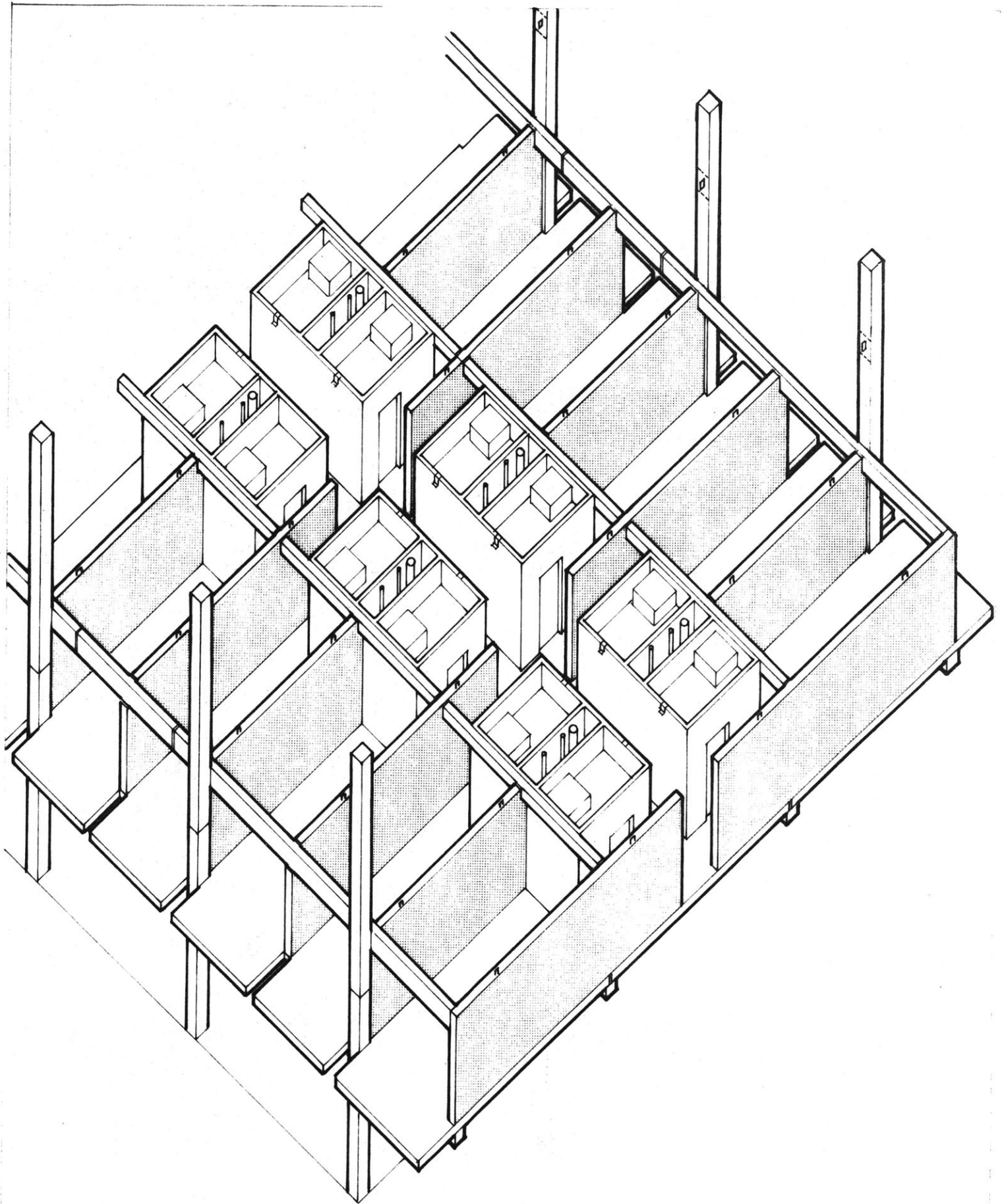
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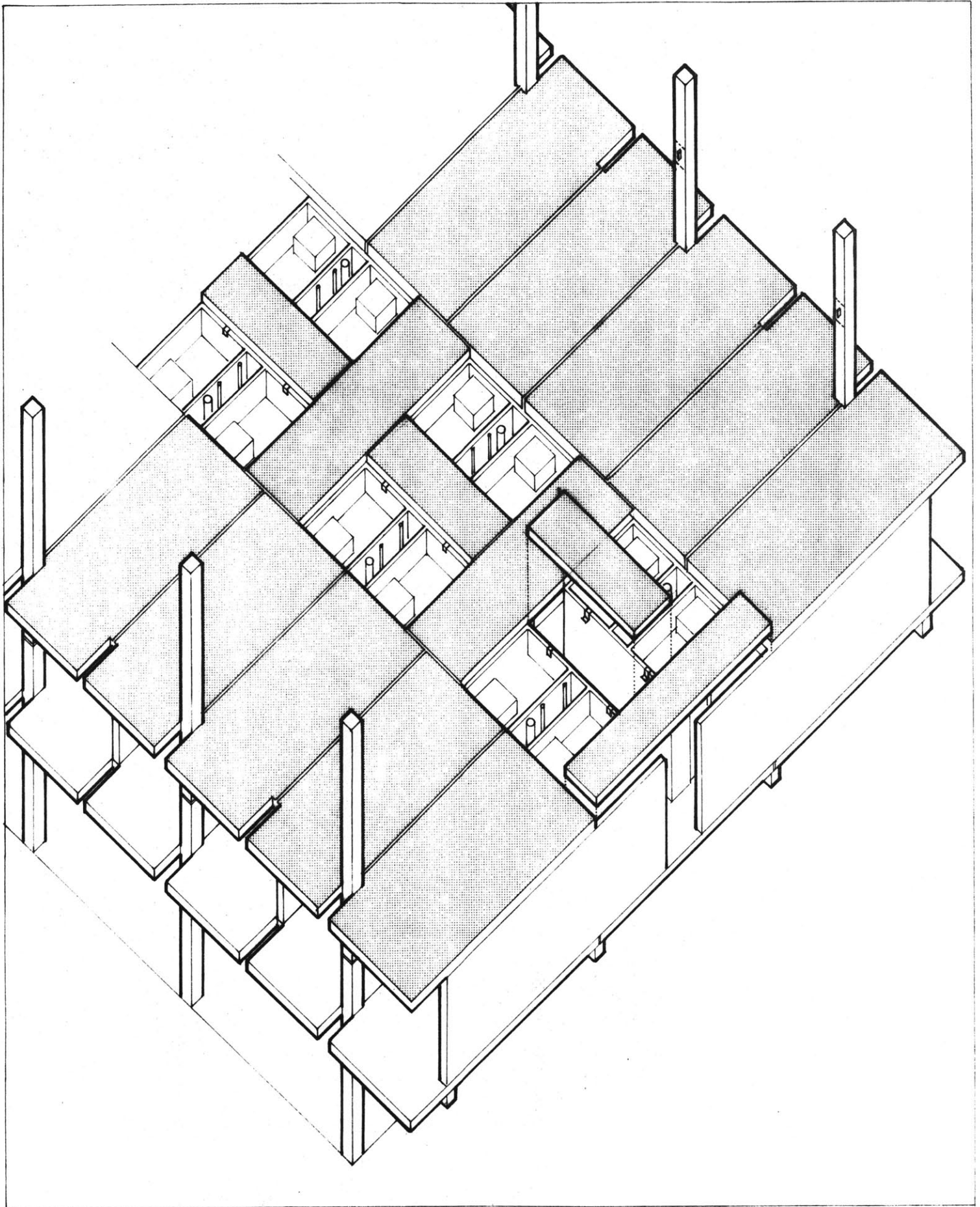
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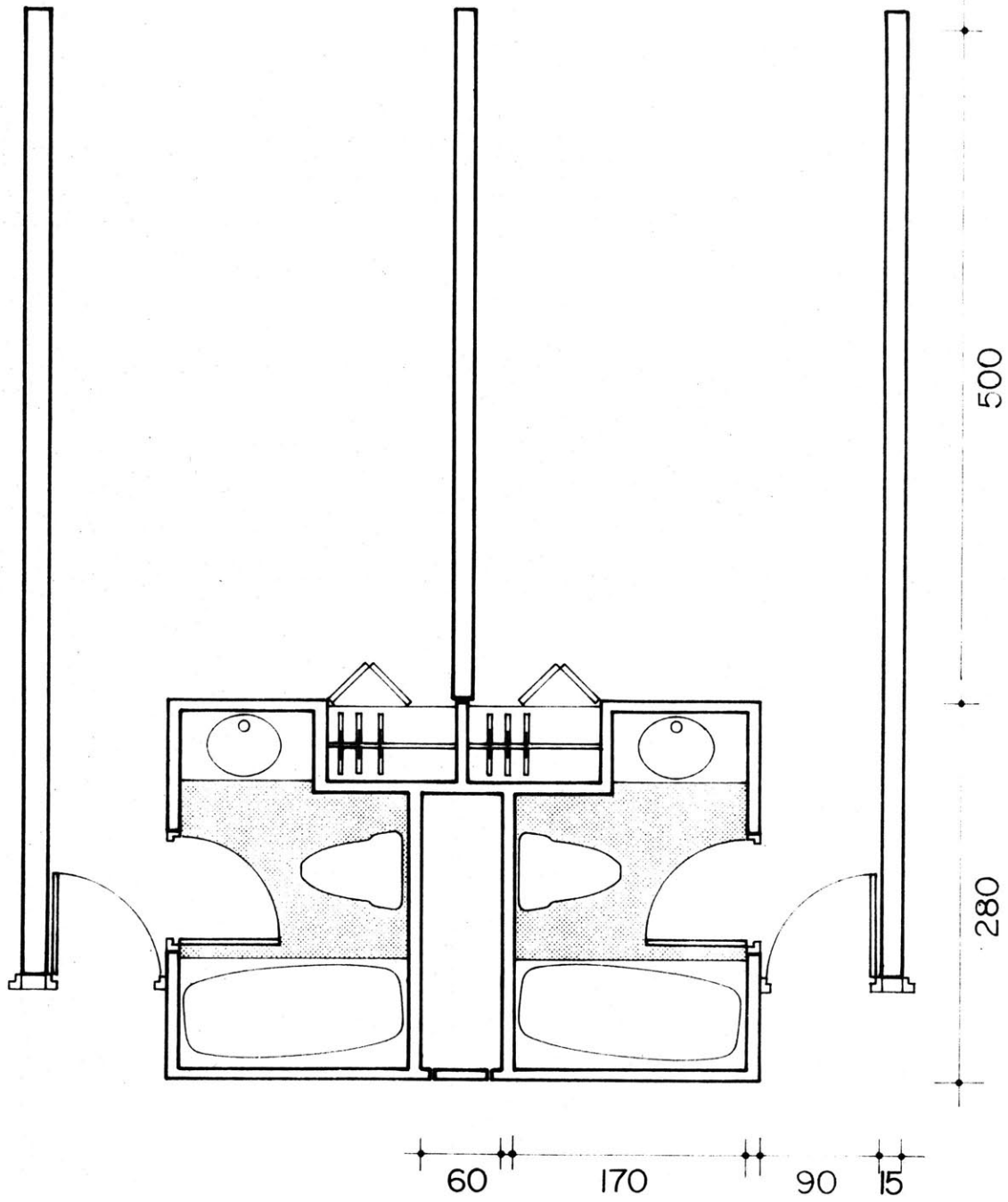
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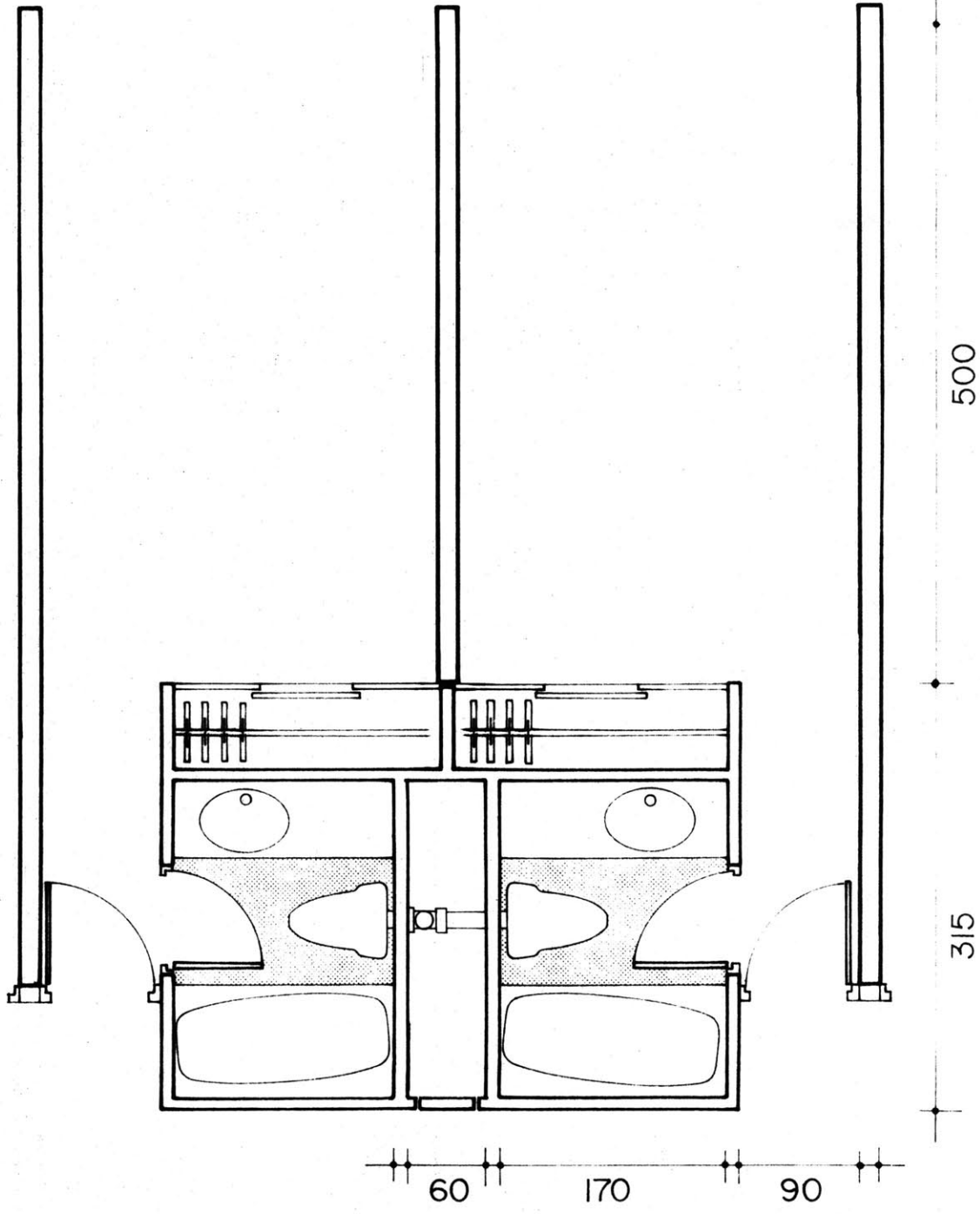
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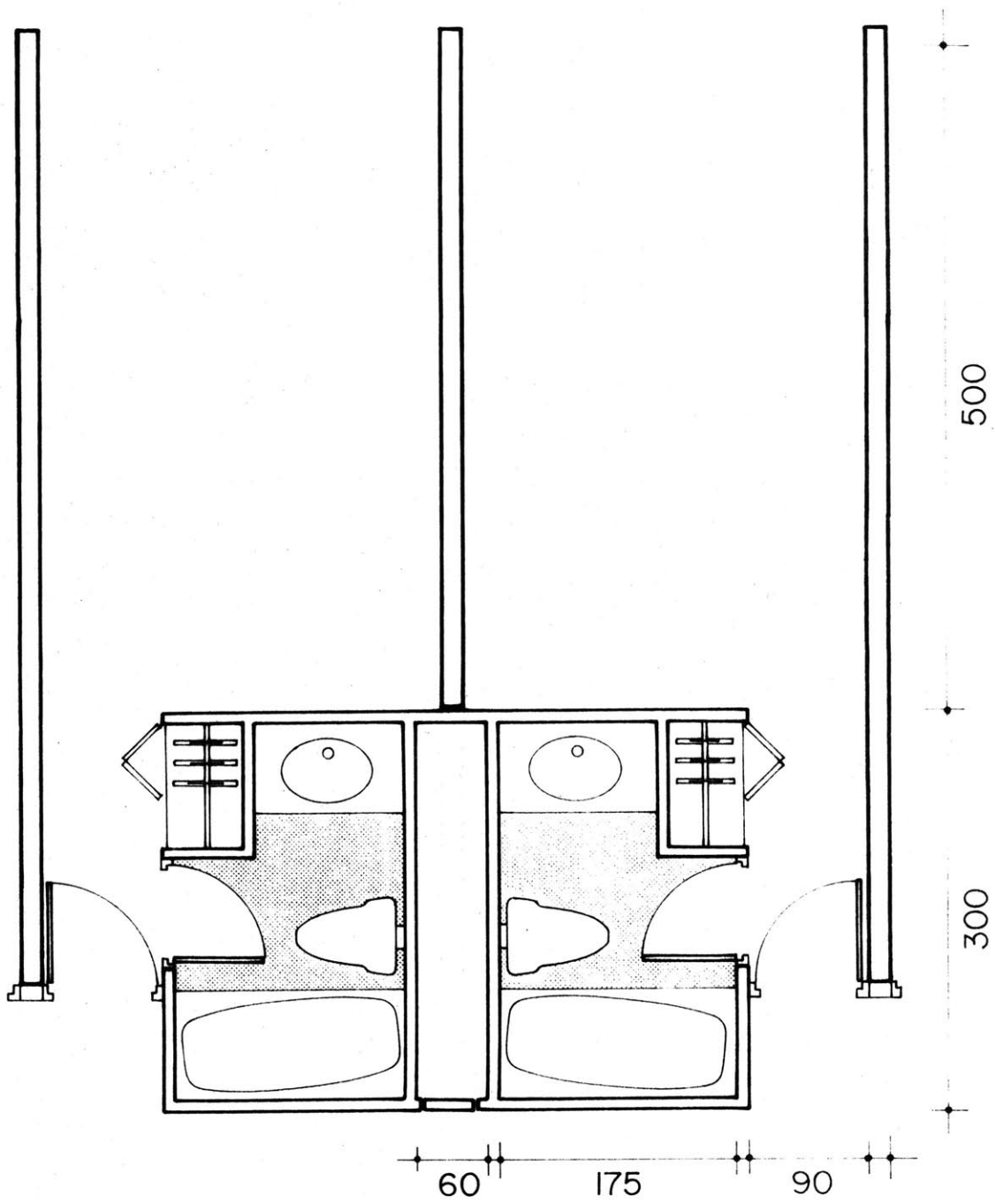
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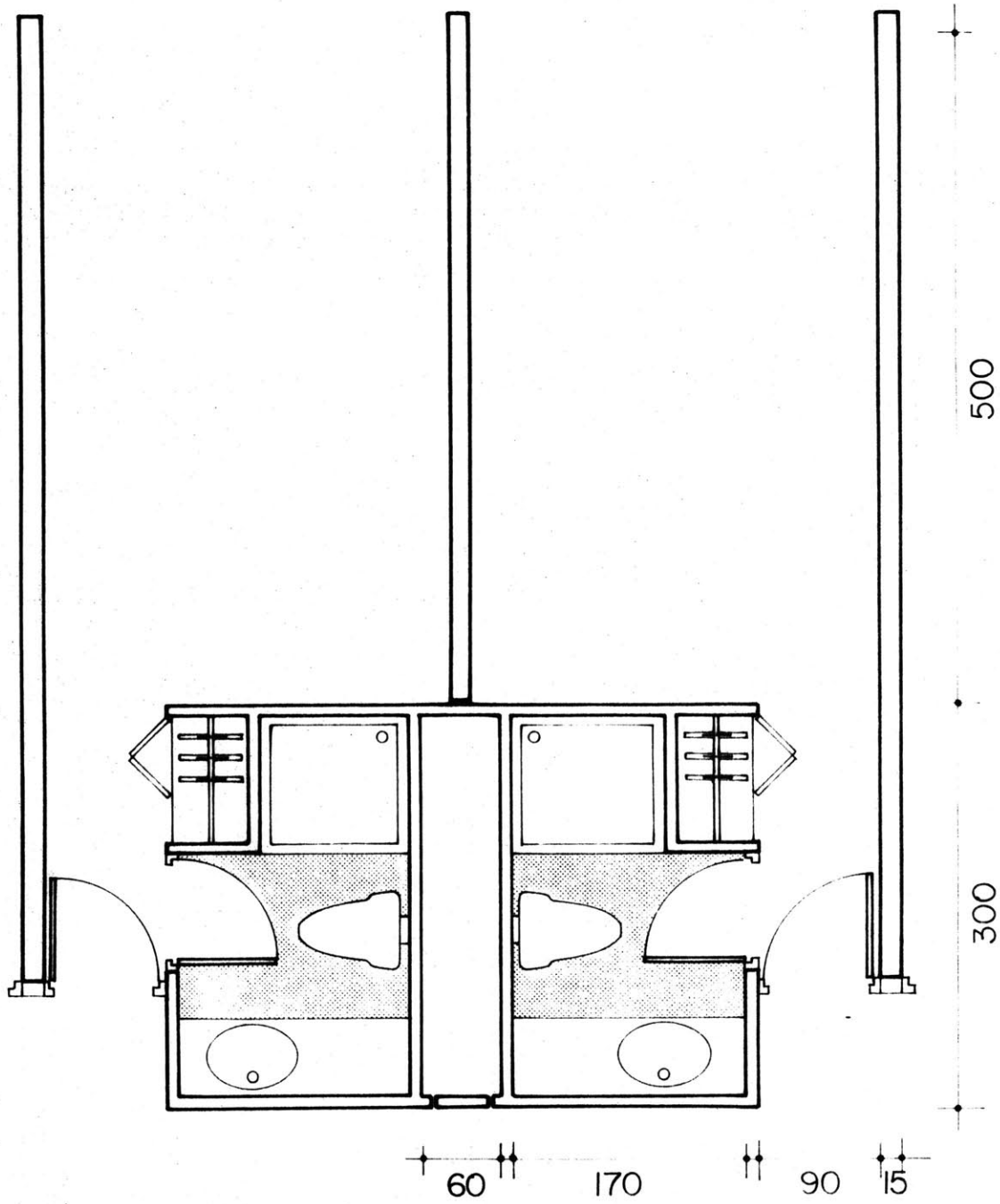
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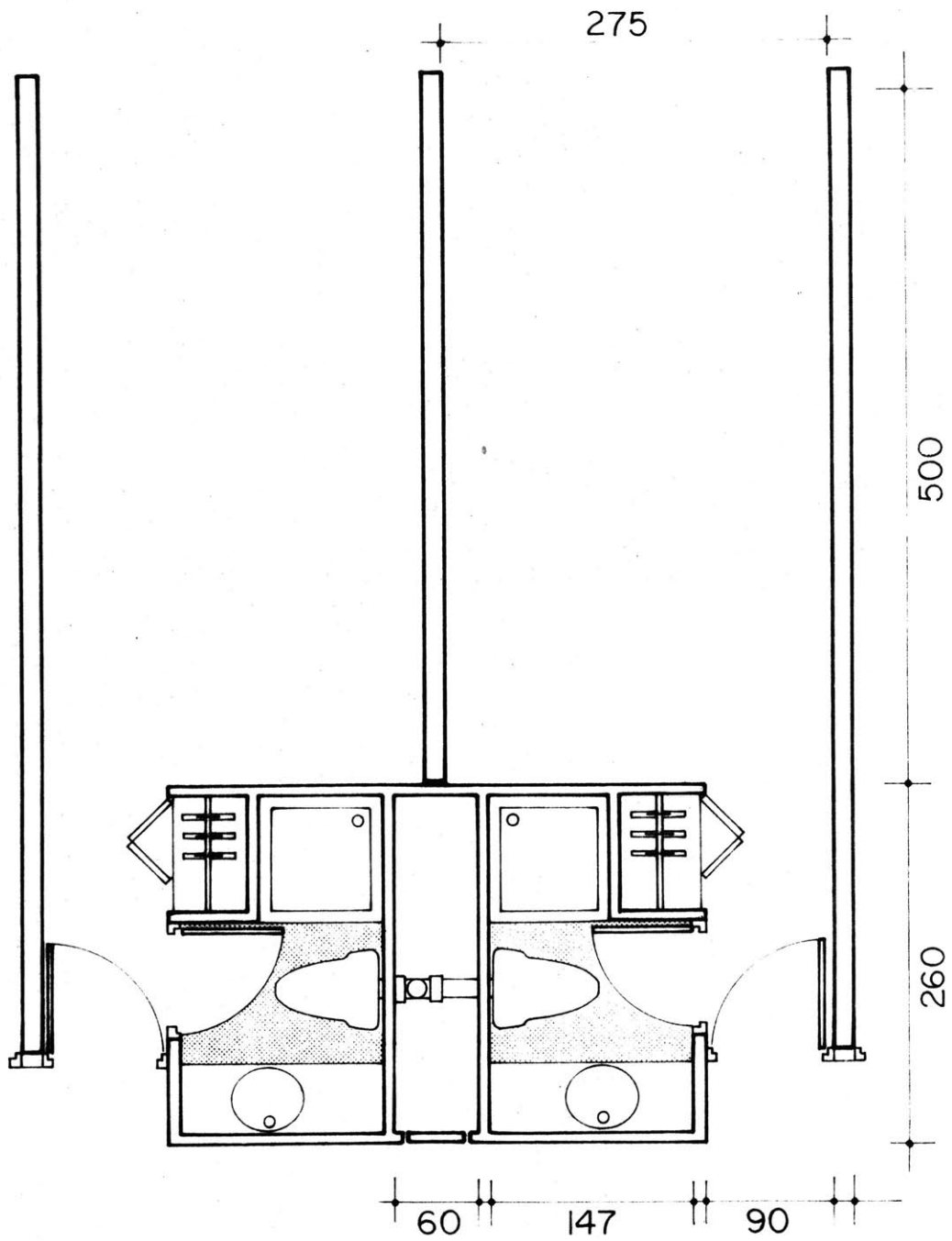
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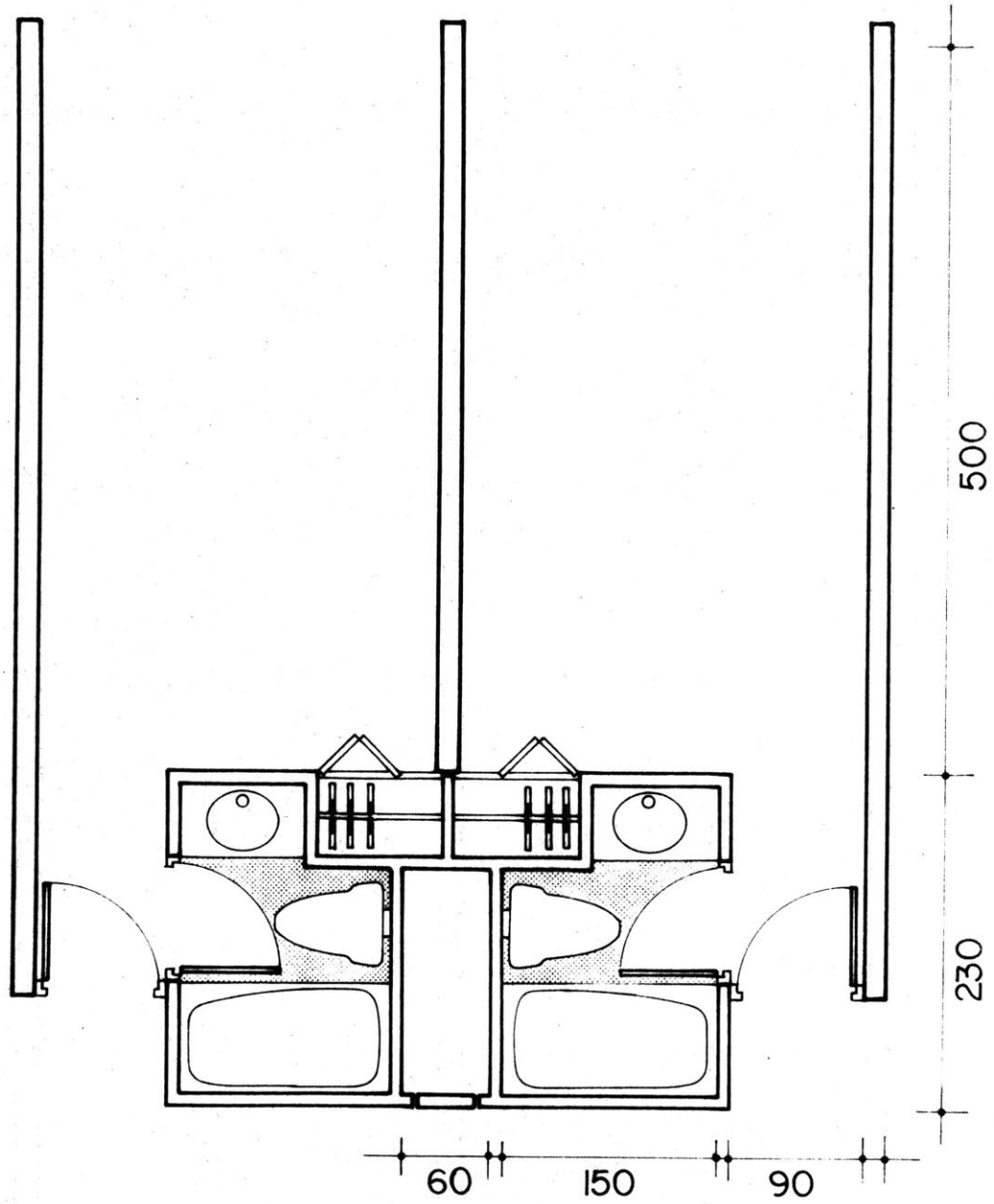


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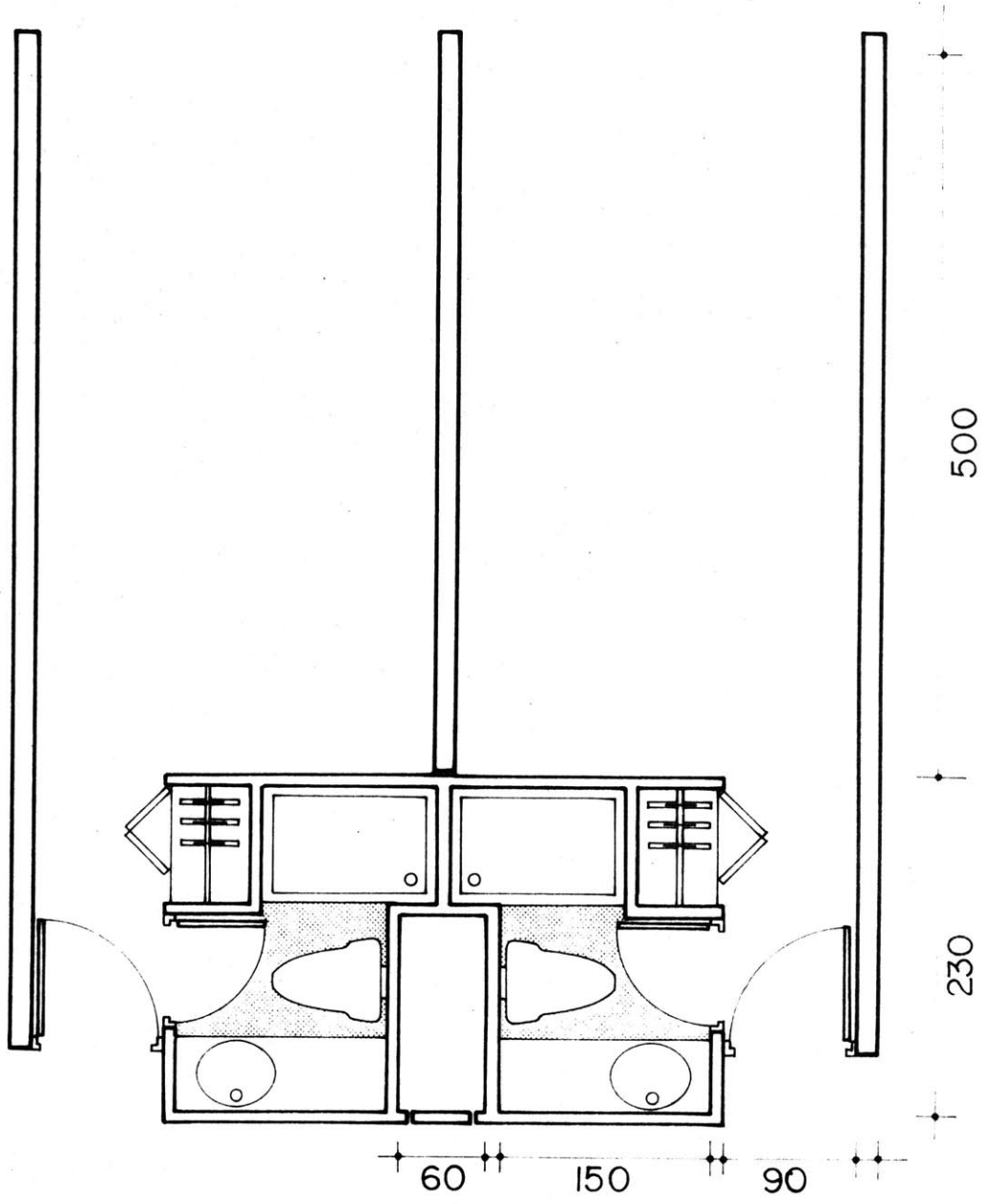


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 BATH 300M2 WIDTH 120M

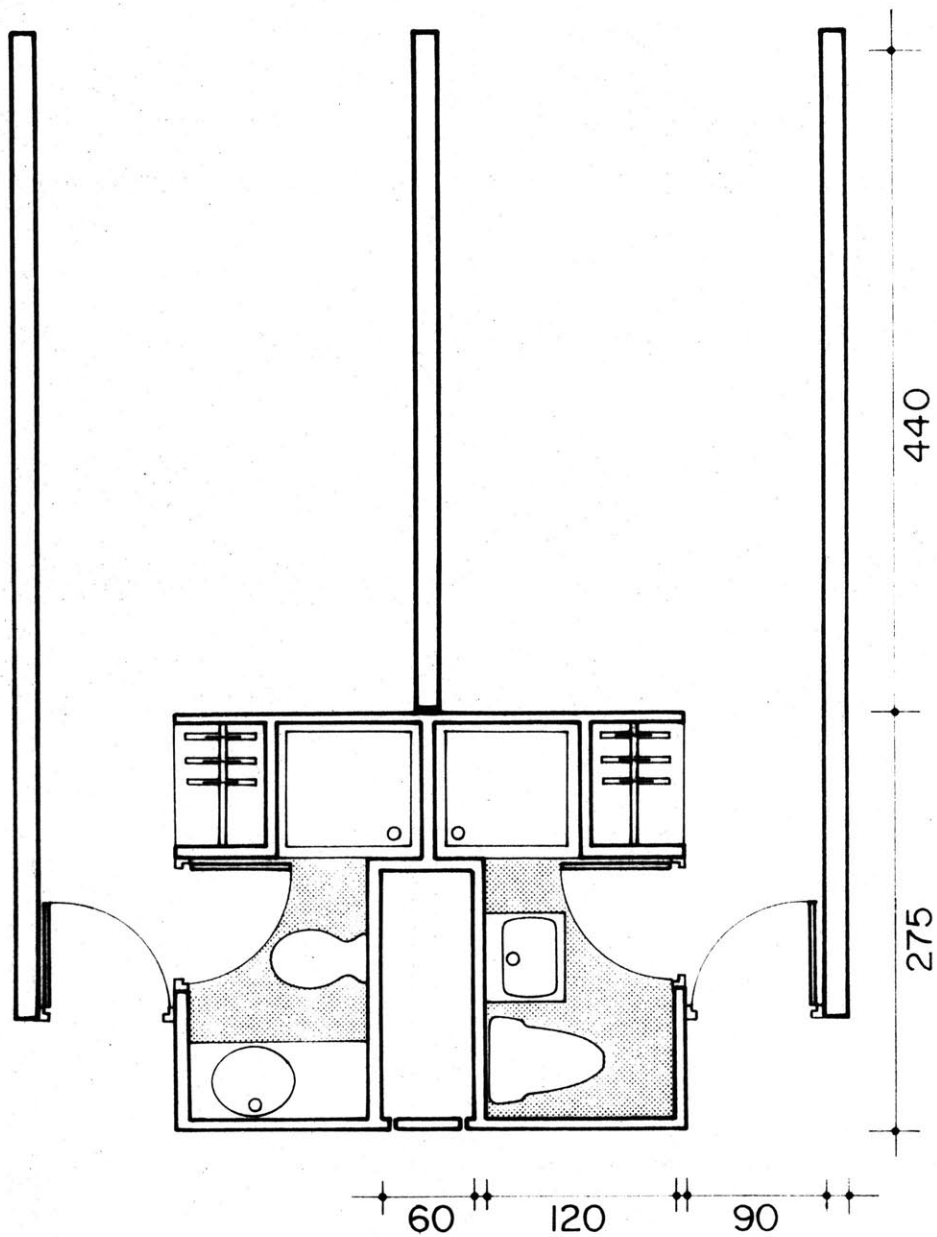
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CLASS **BB** BATHROOM UNIT TYPE

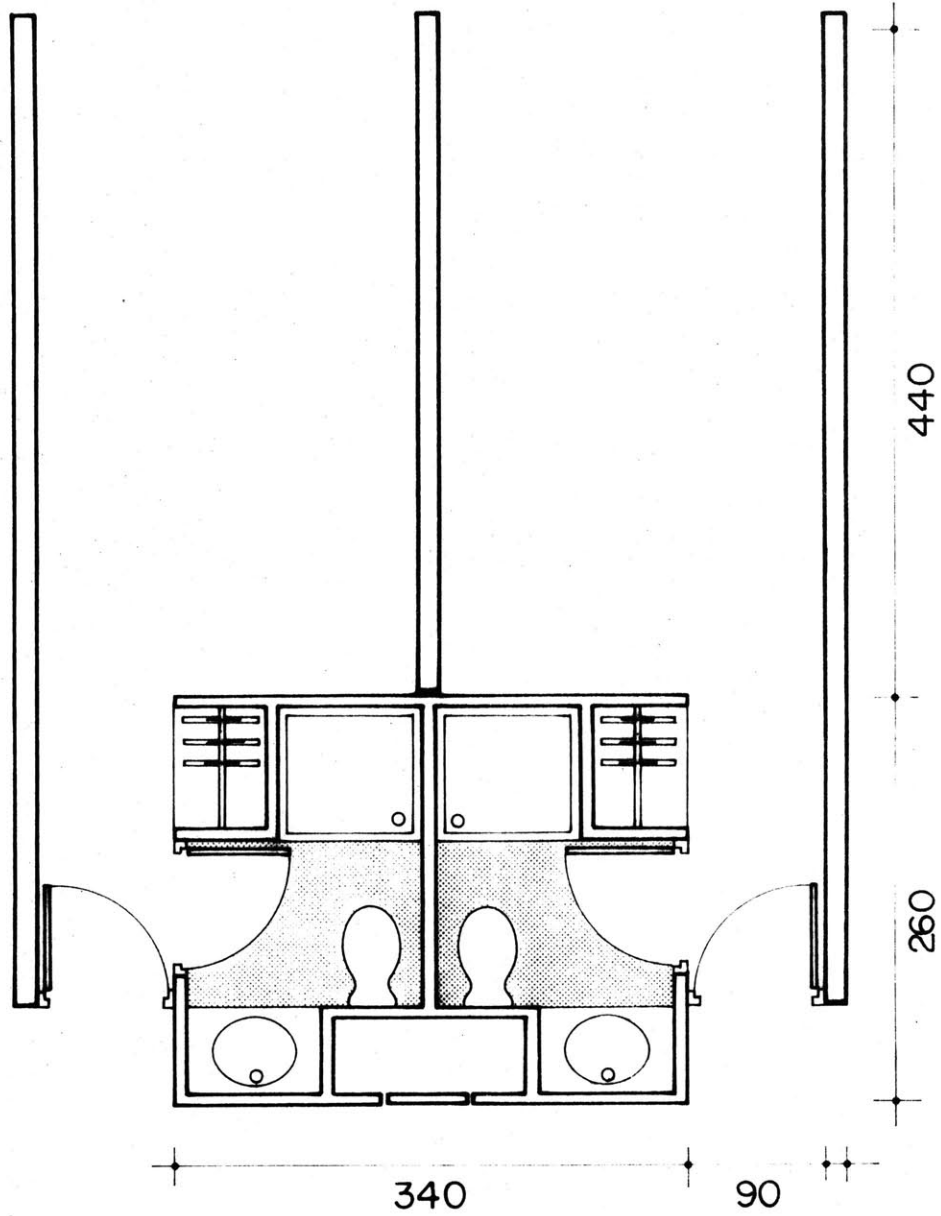


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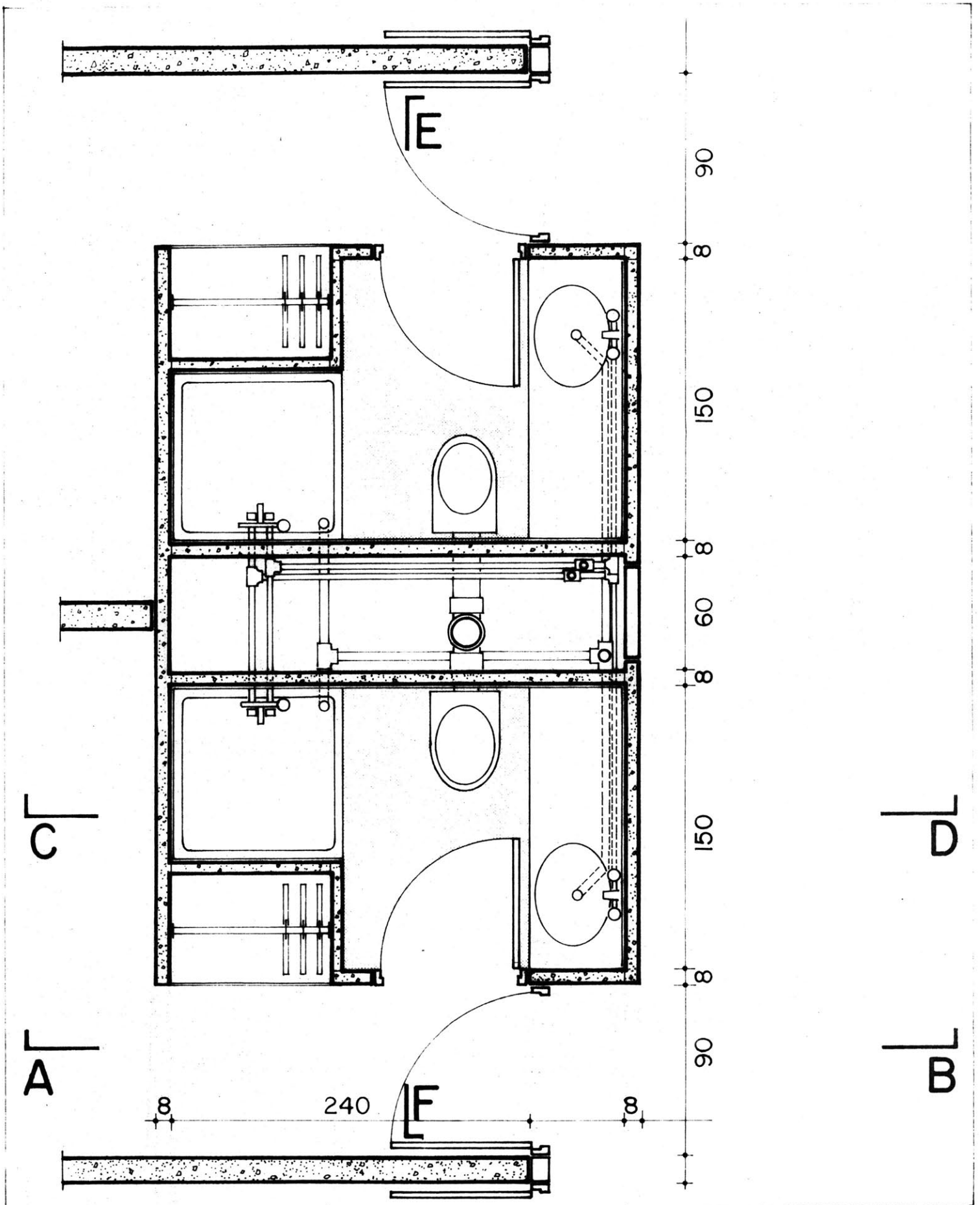


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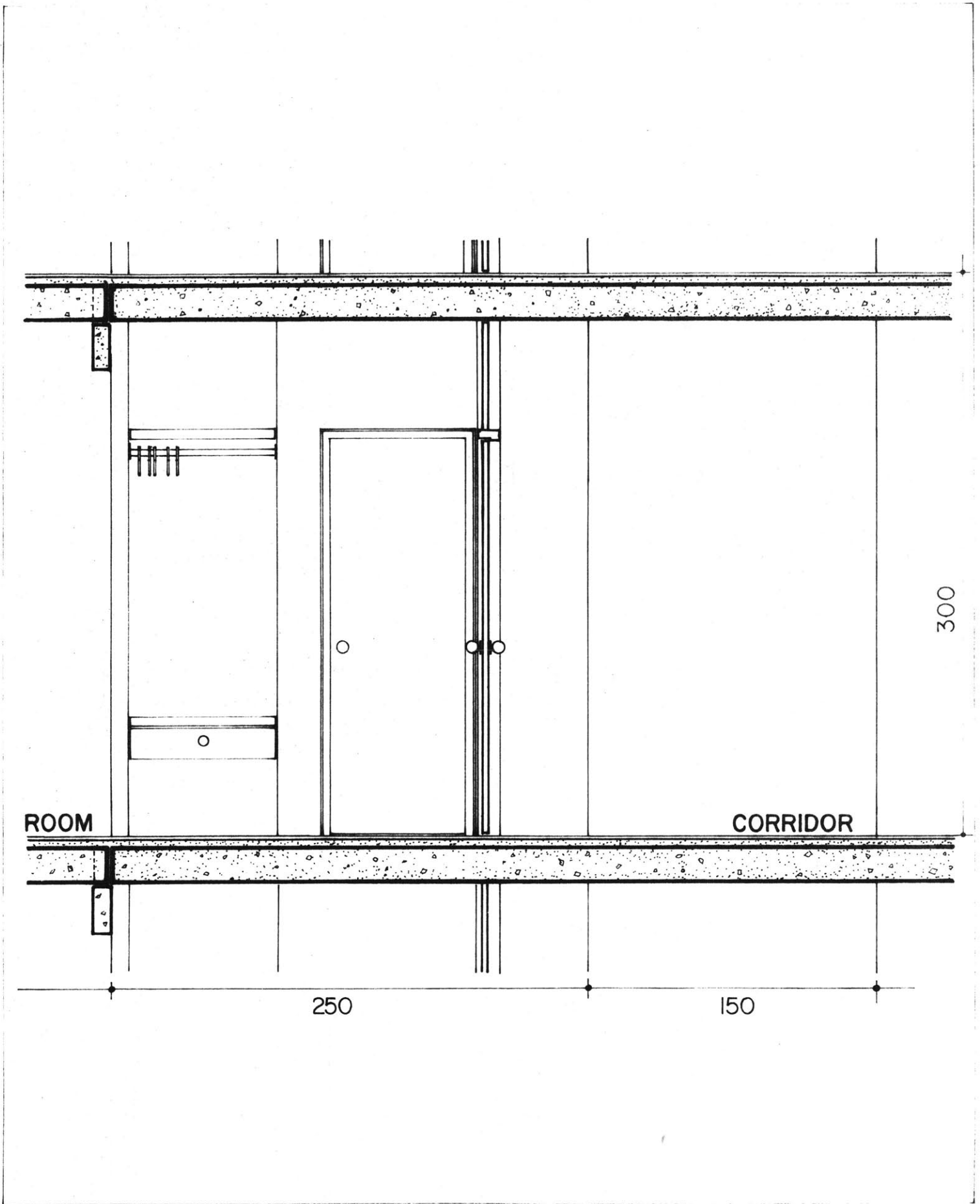


CLASS **CB** BATHROOM UNIT TYPE



**BA** BATHROOM UNIT

PLAN



ROOM

CORRIDOR

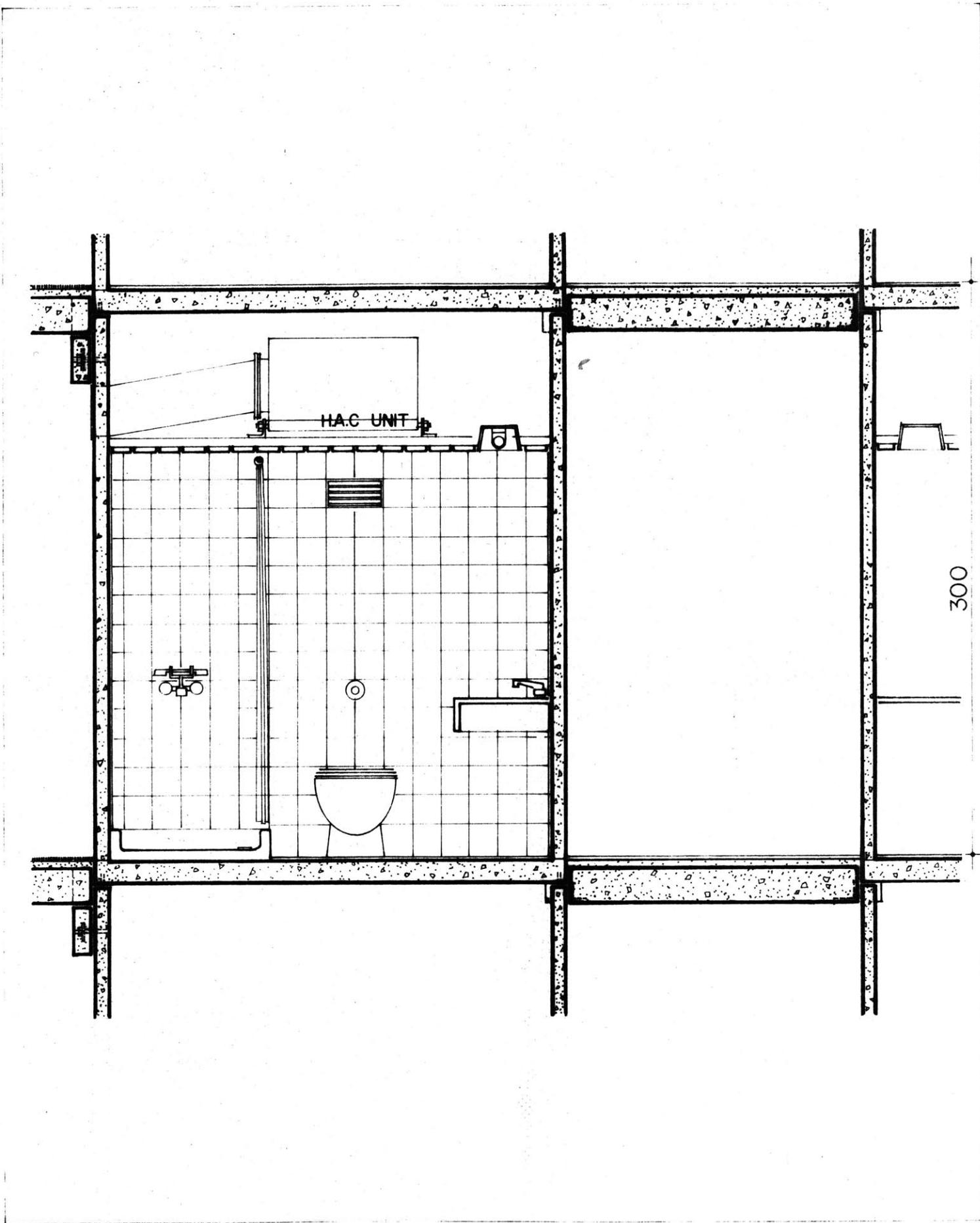
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150

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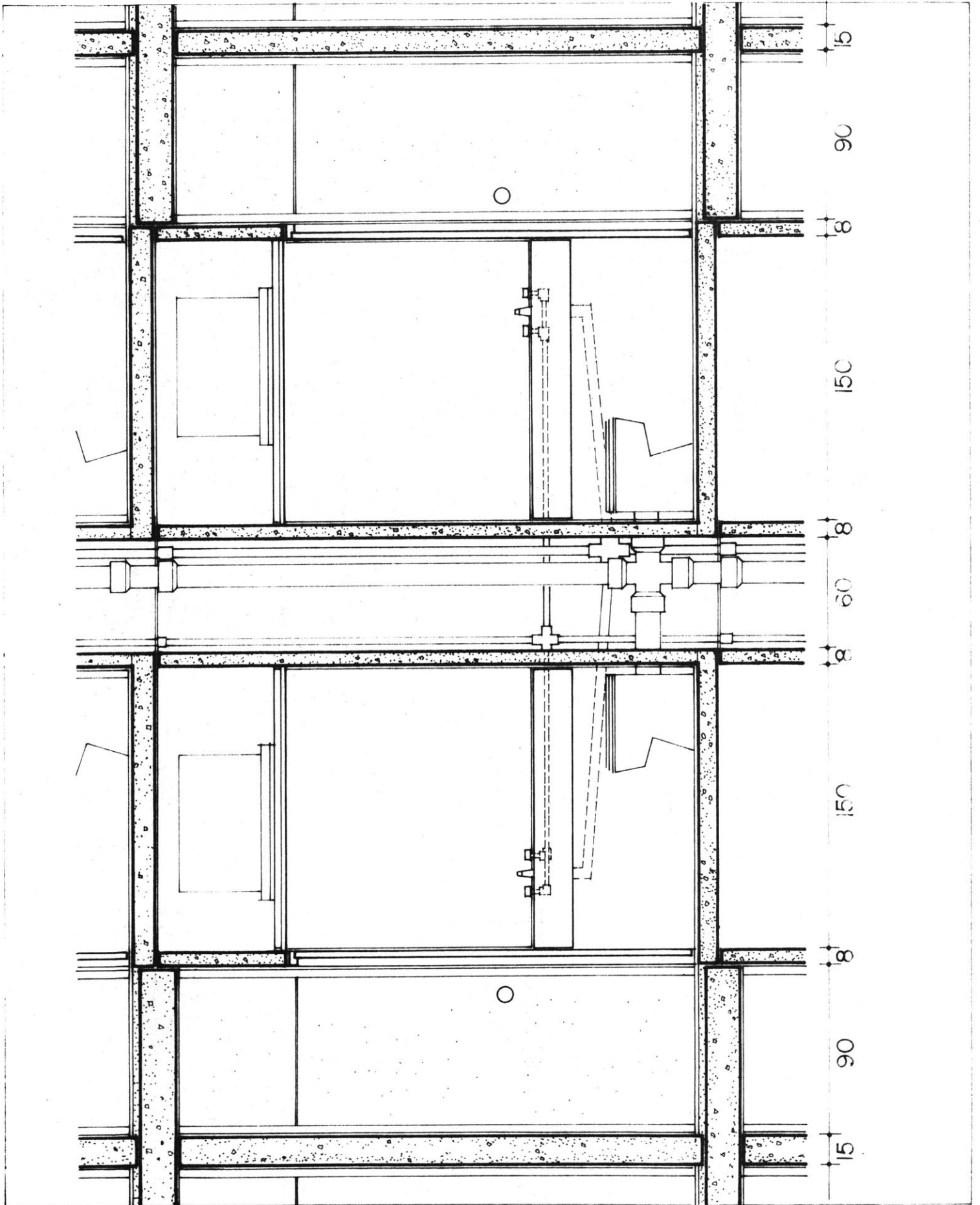
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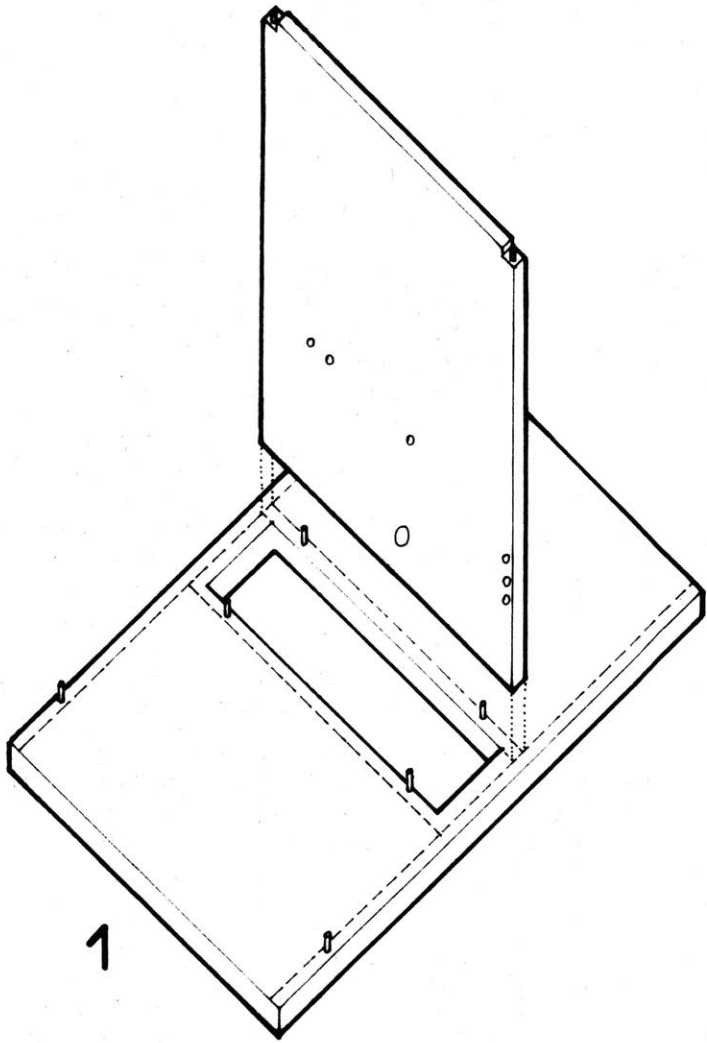
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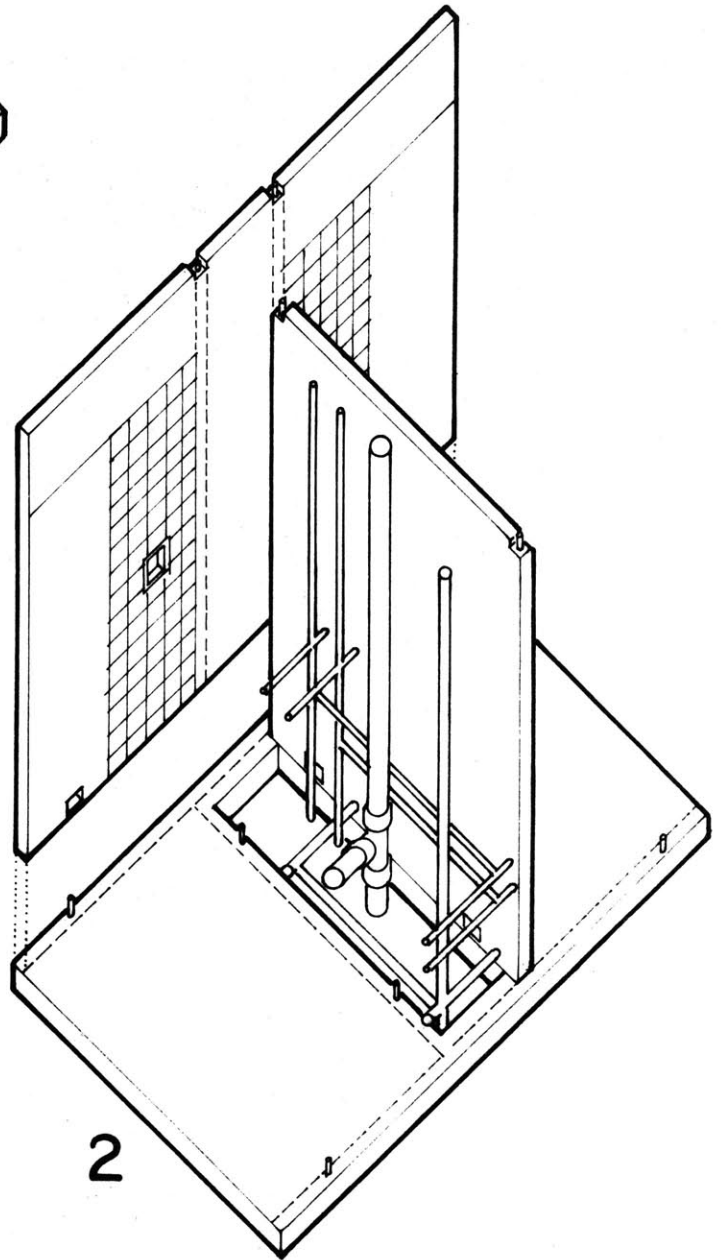


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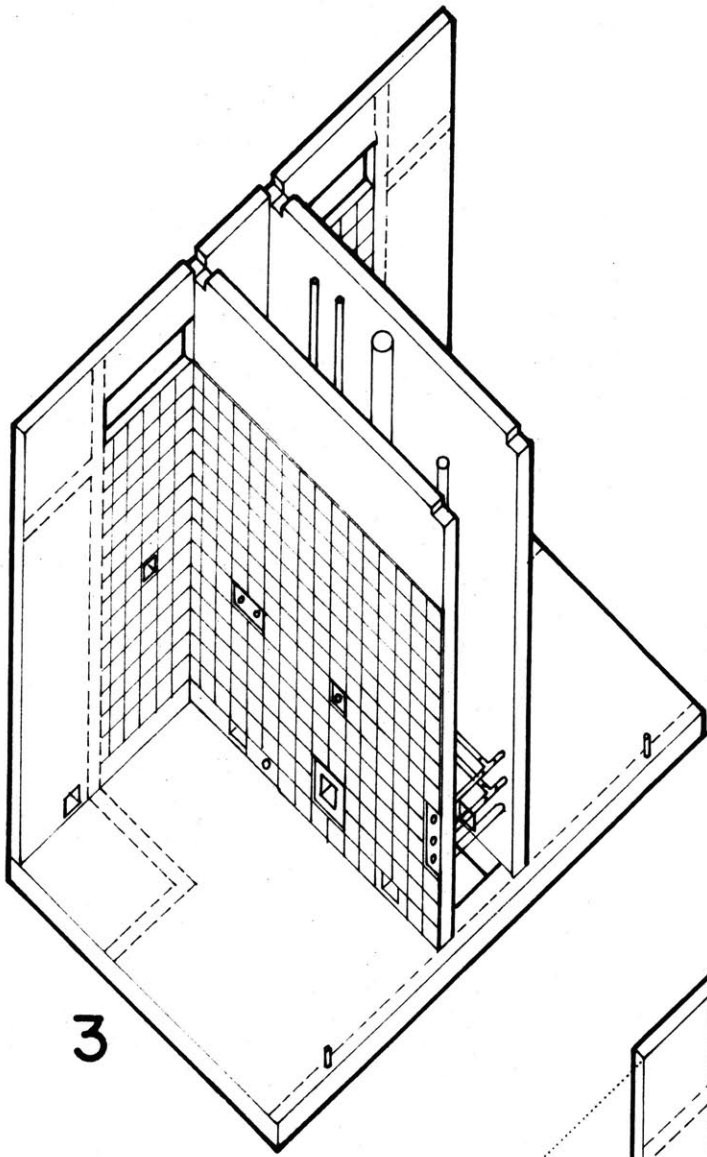
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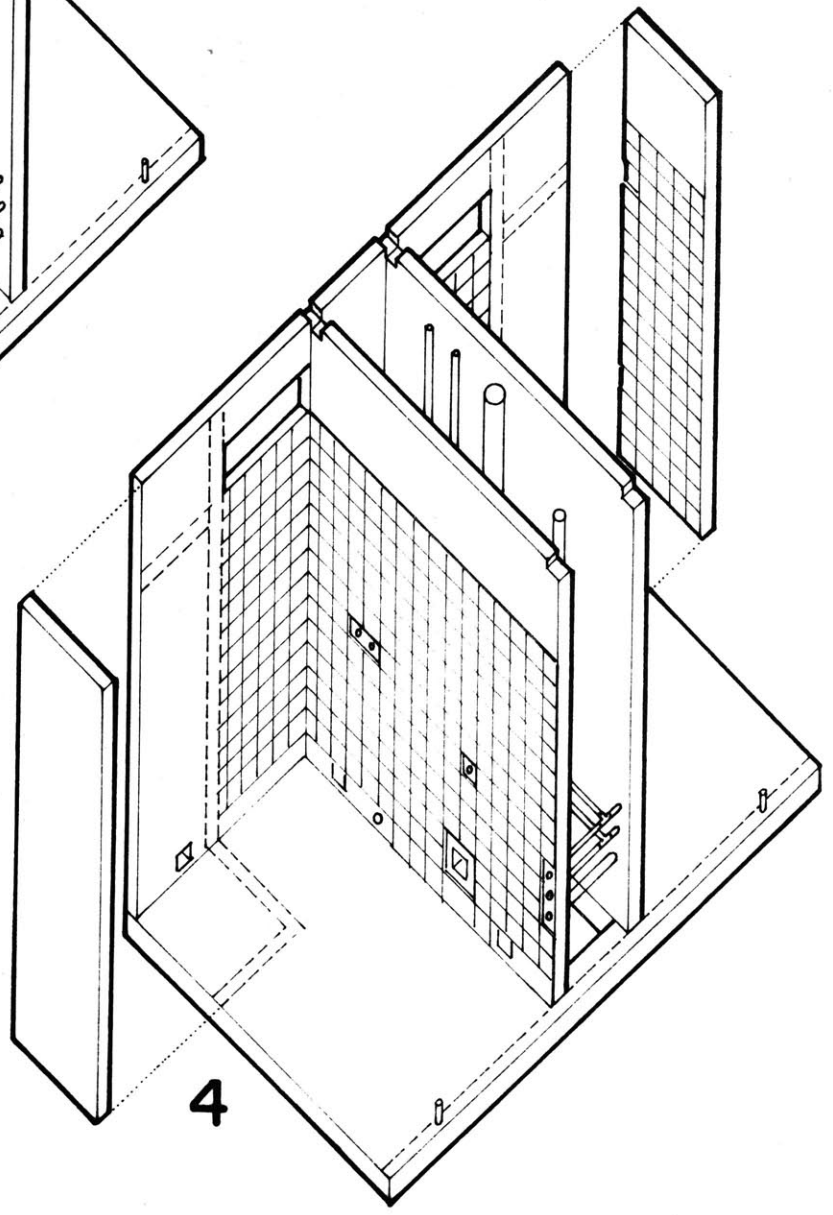
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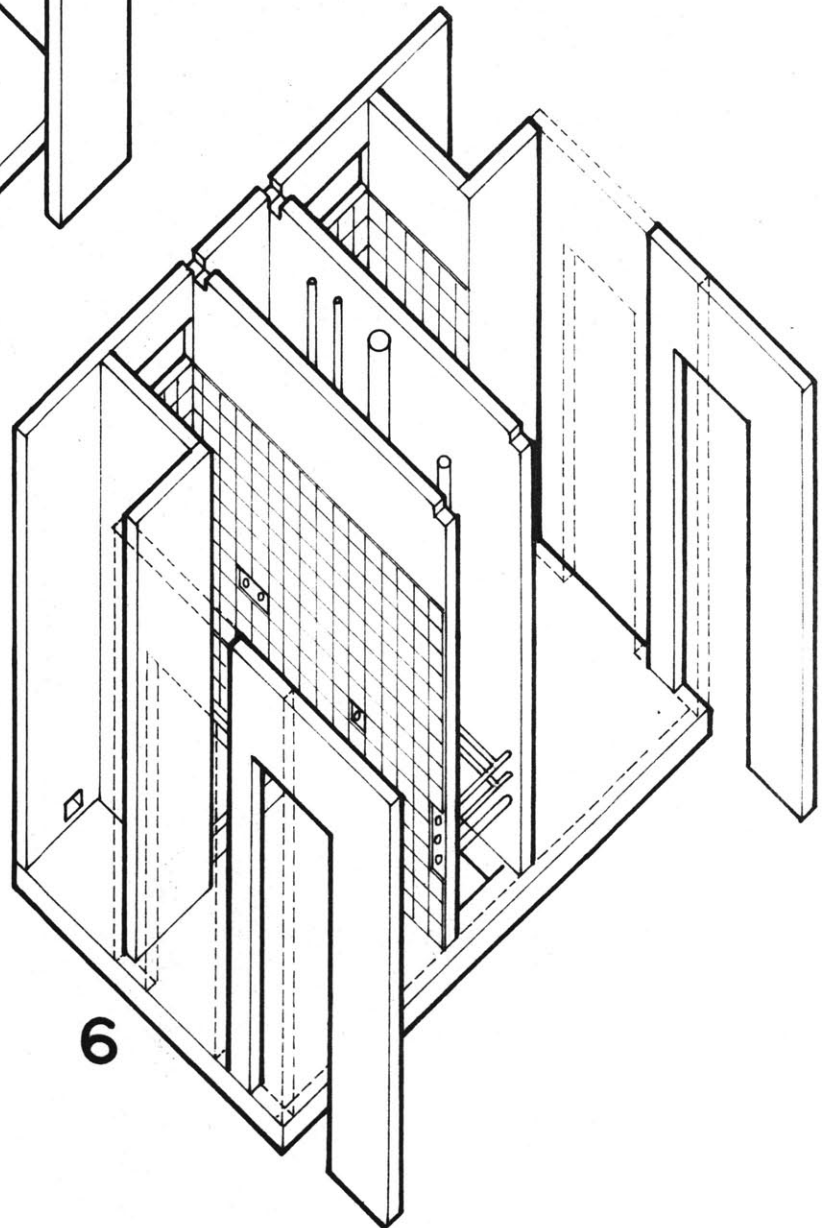
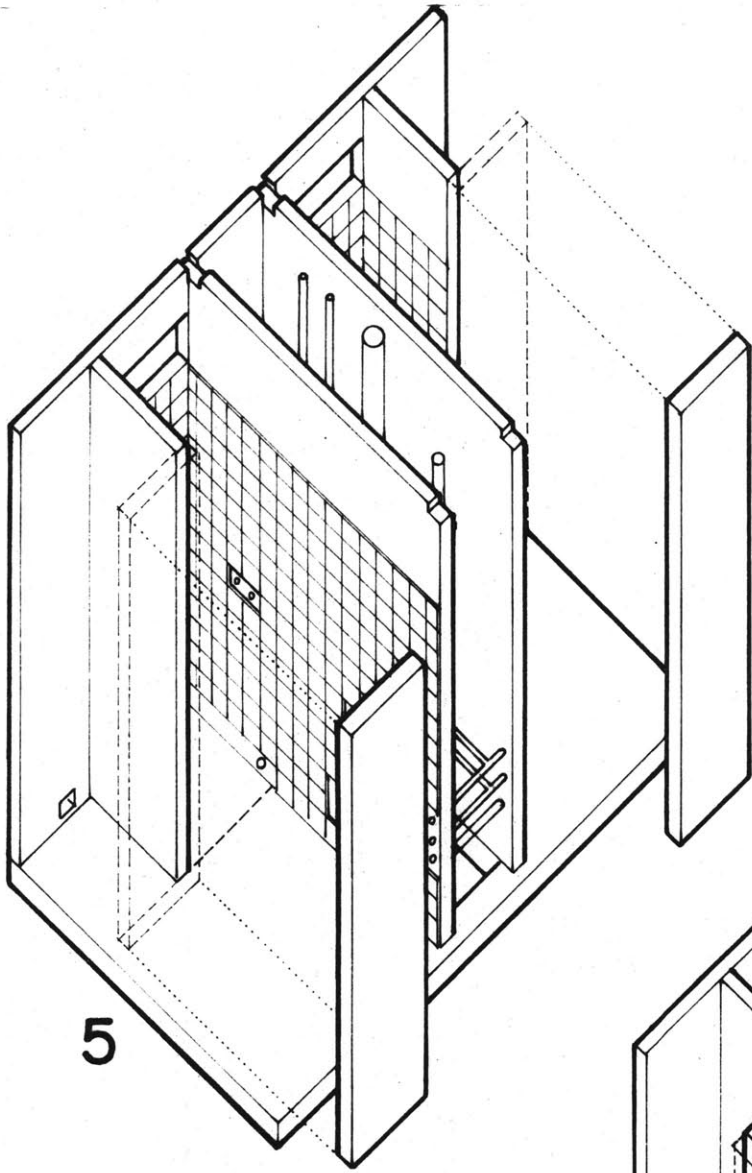
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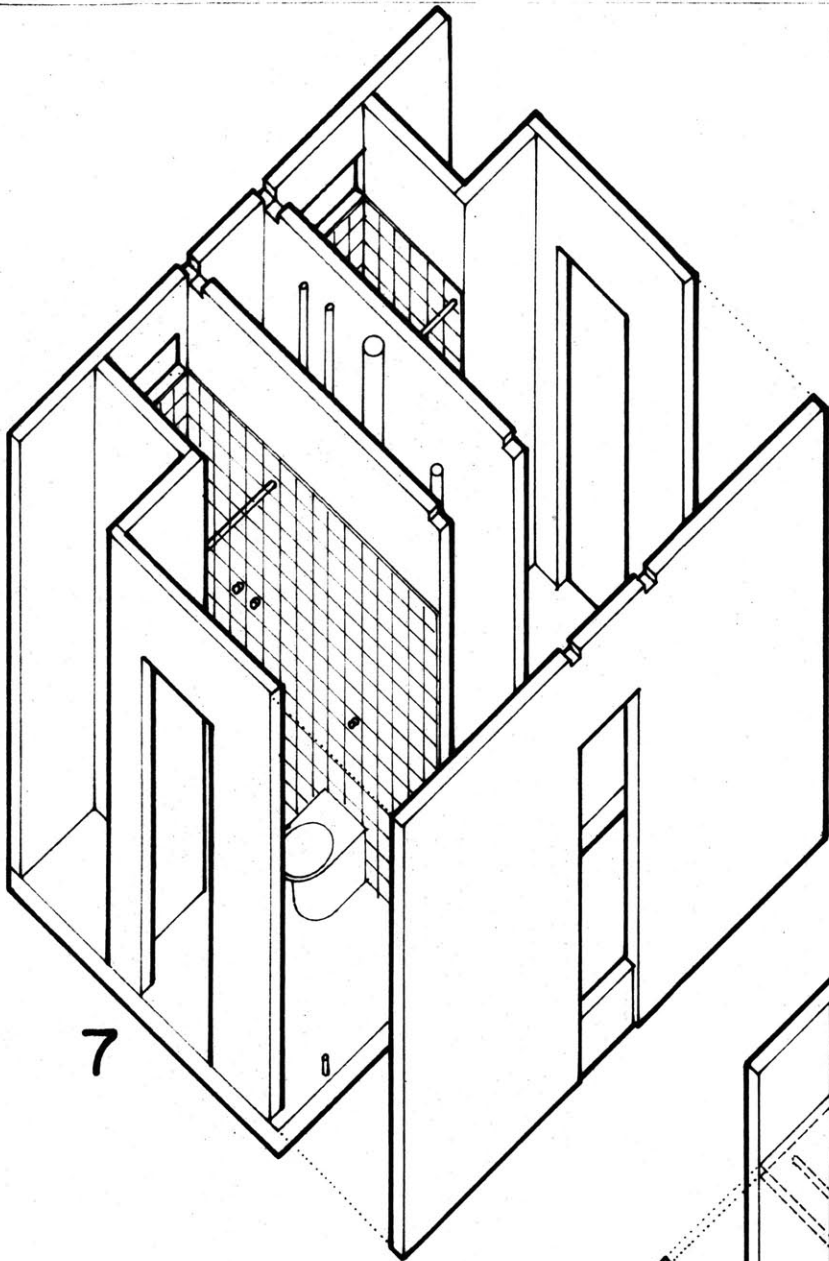
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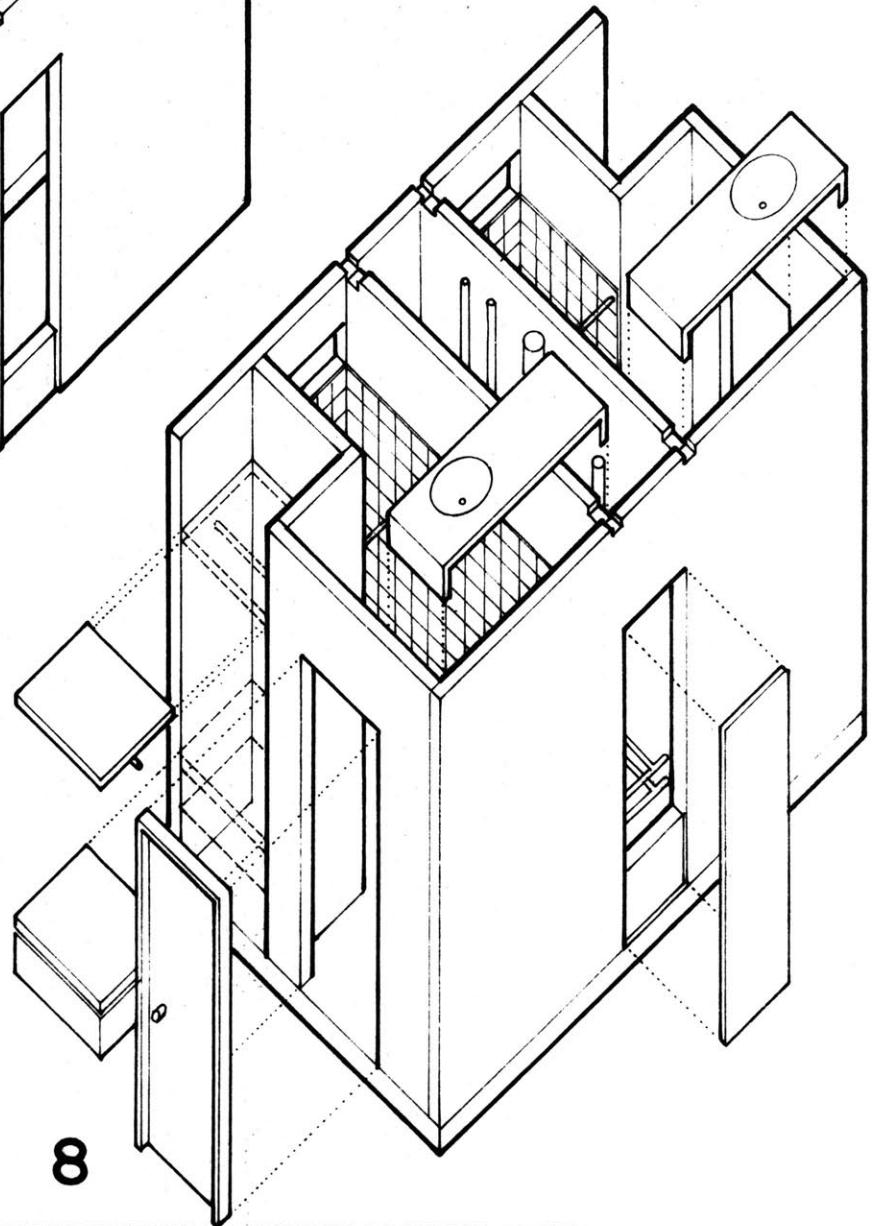


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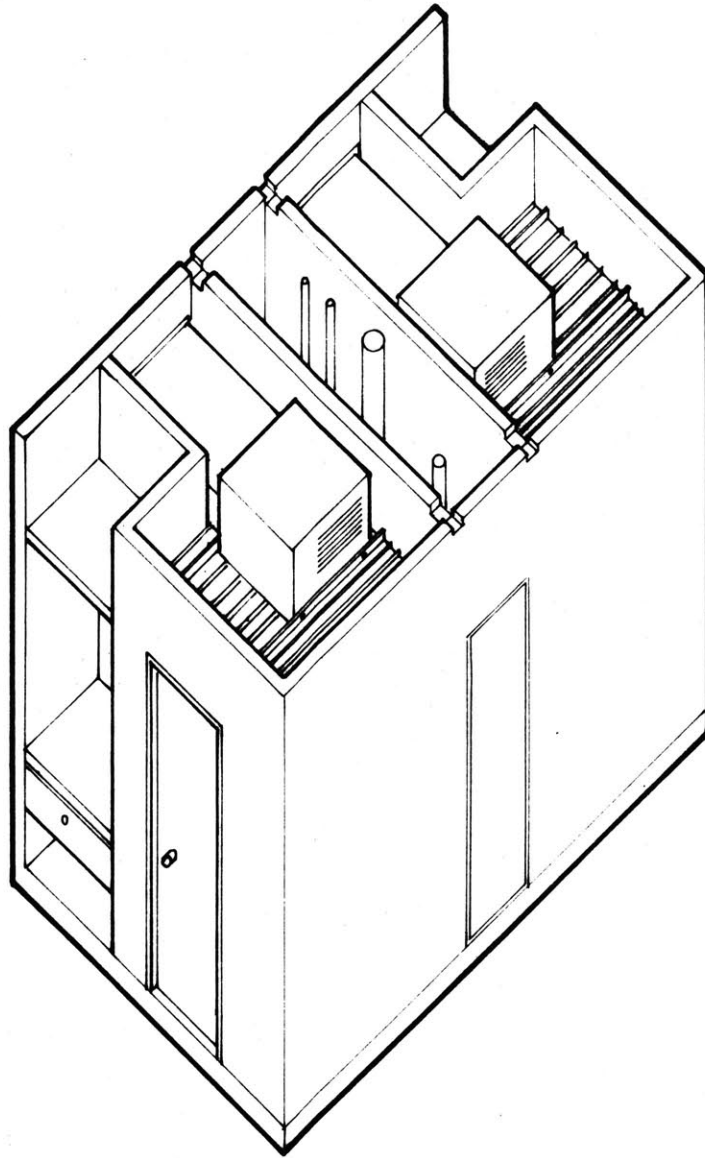
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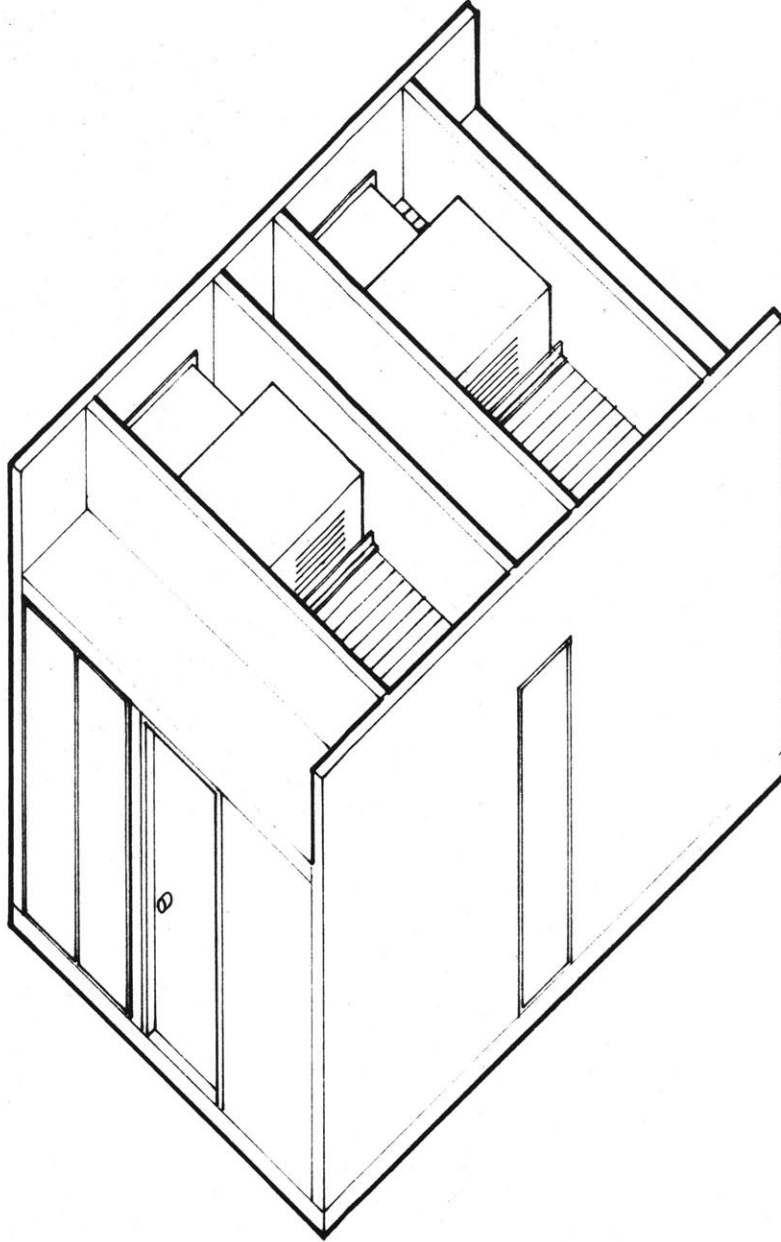
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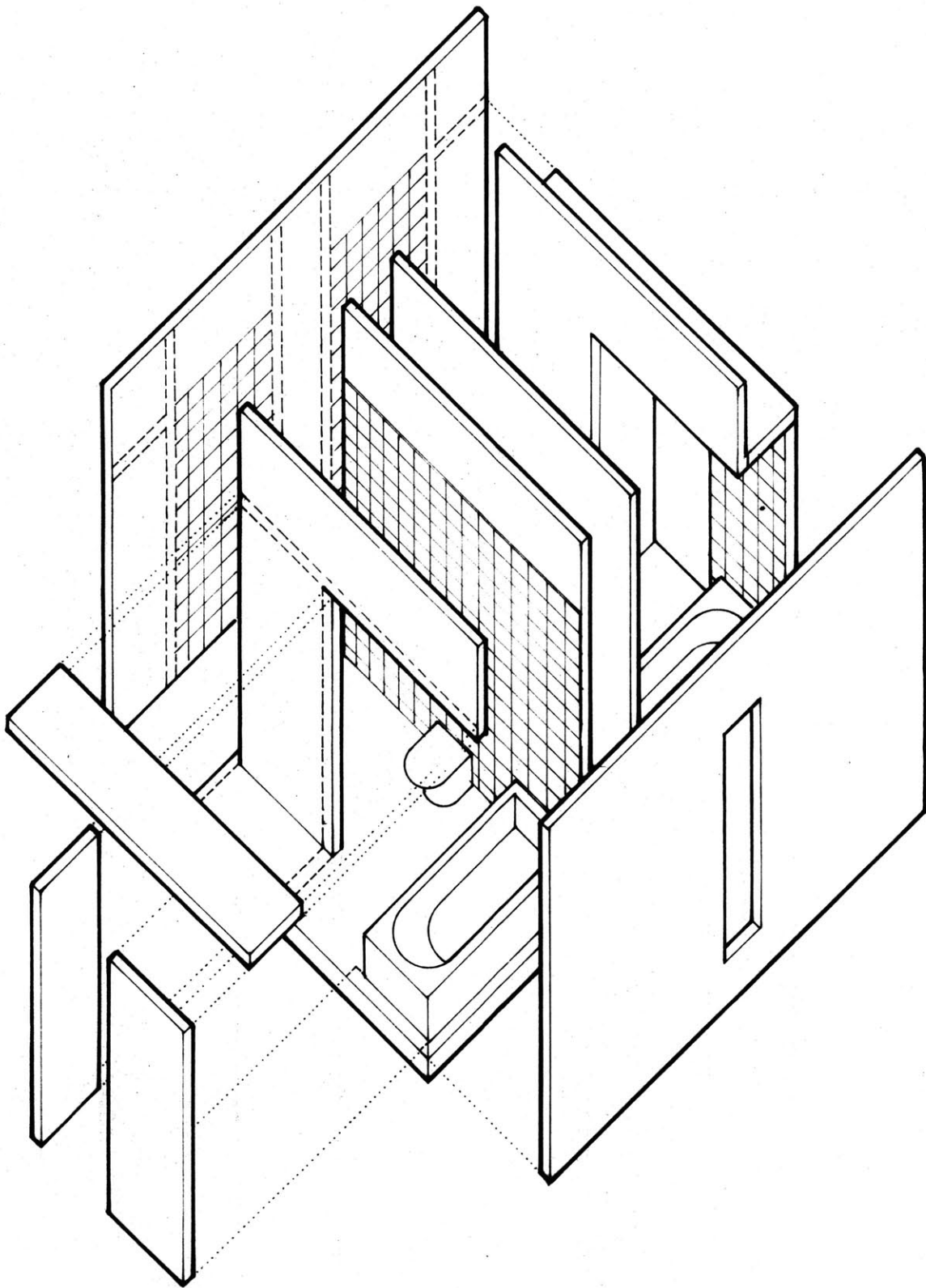
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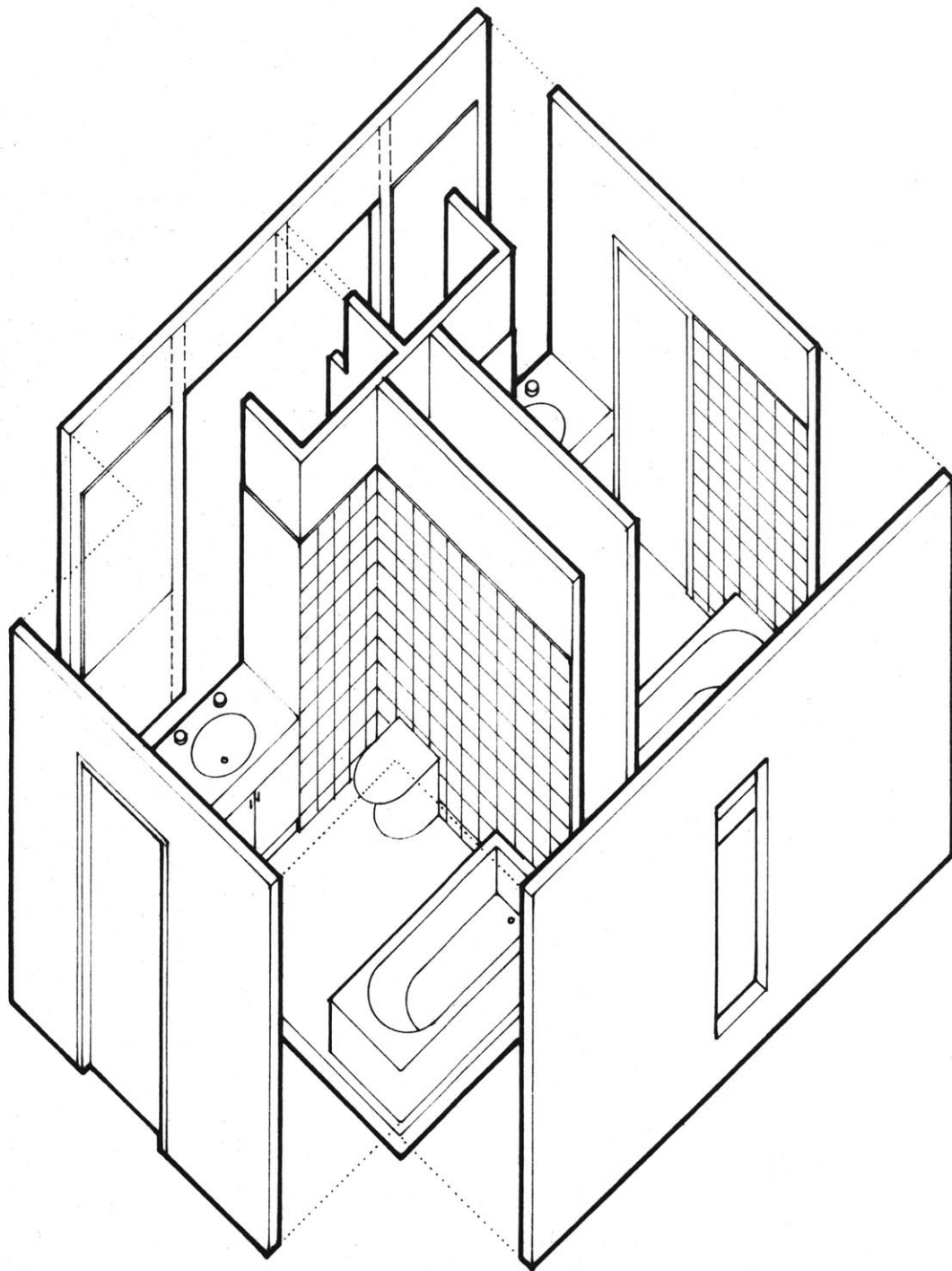
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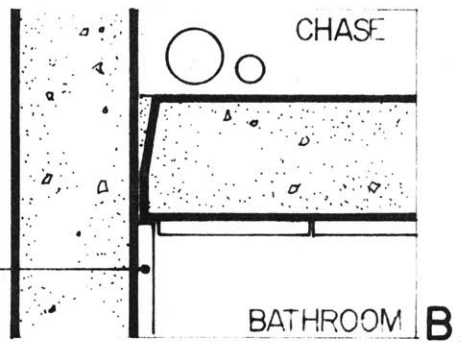
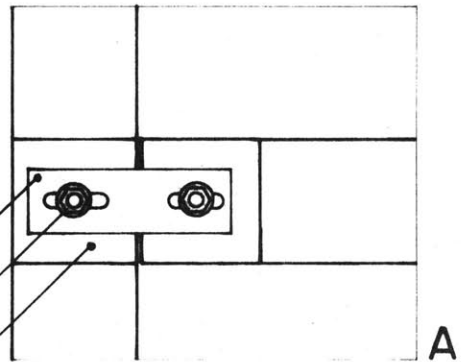
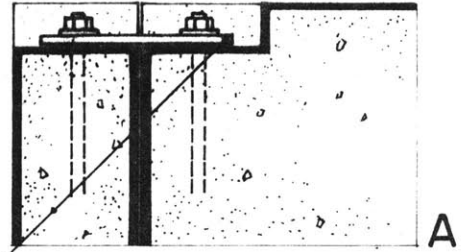
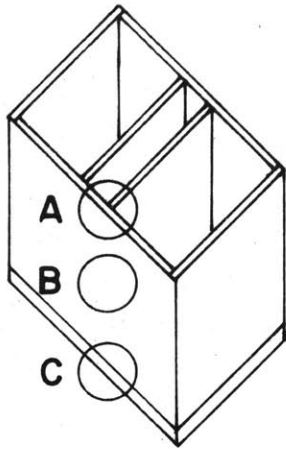
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EXPLODED VIEW



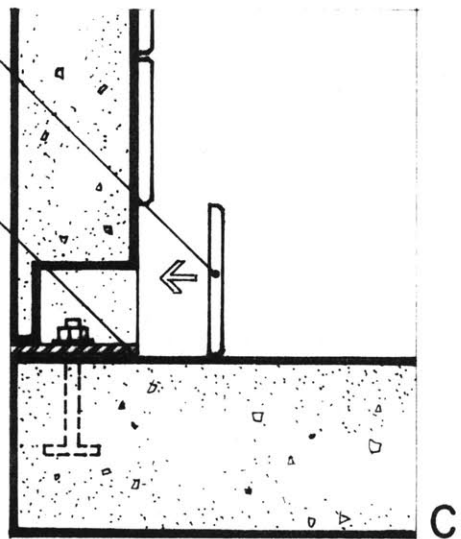
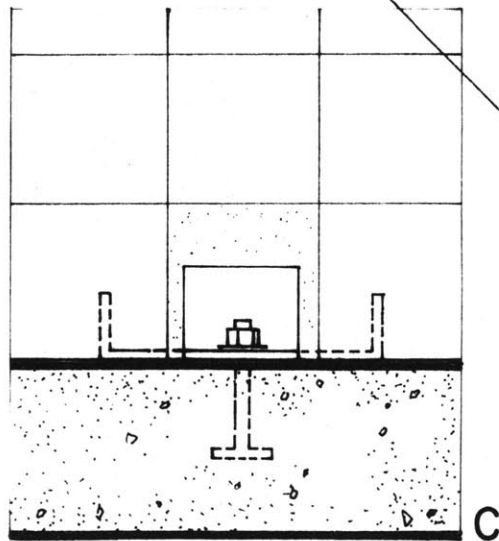
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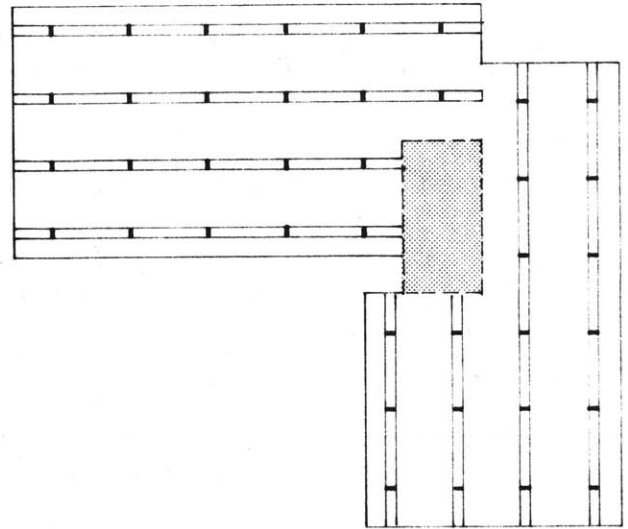
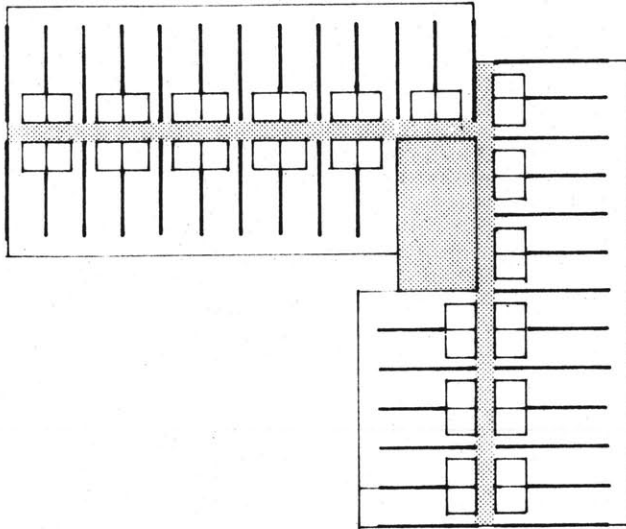
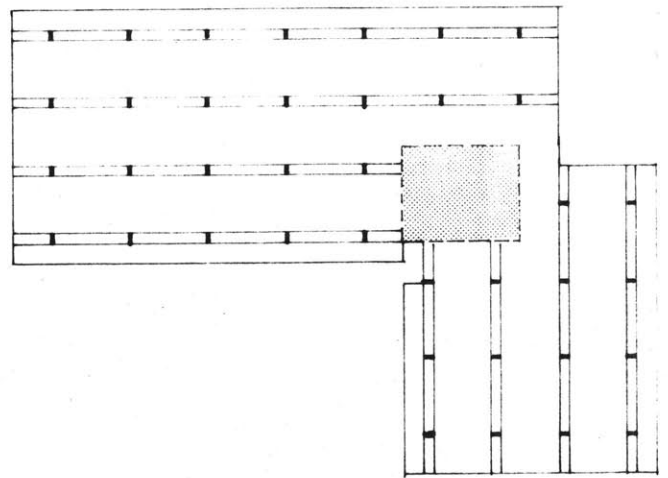
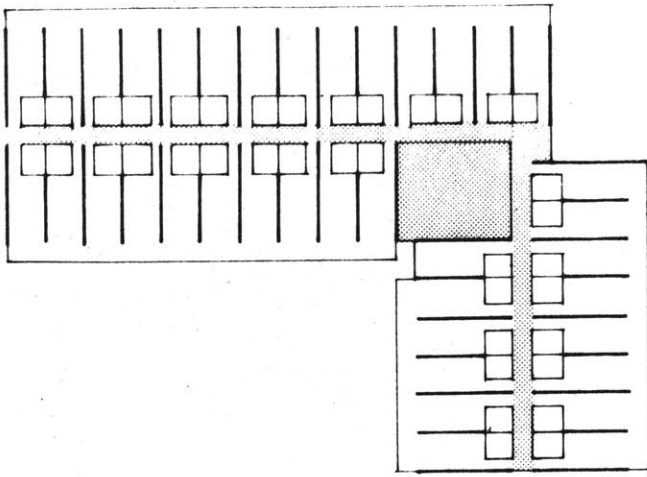
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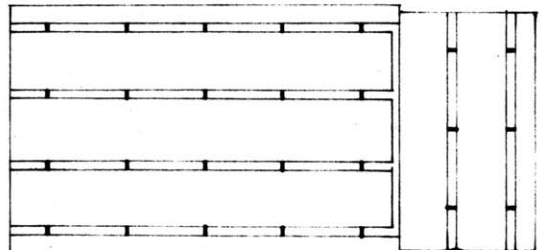
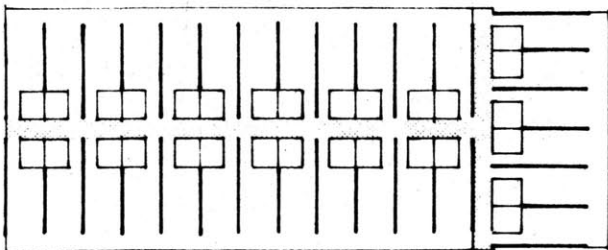
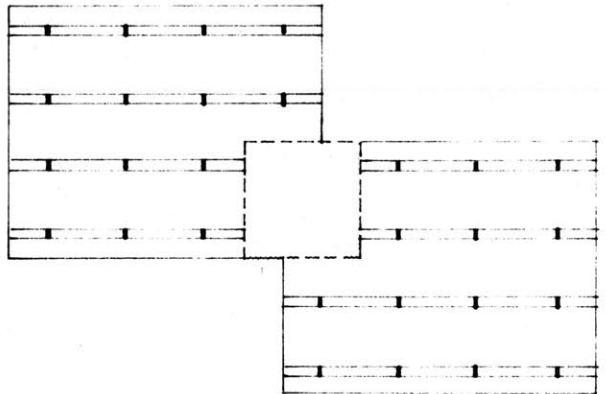
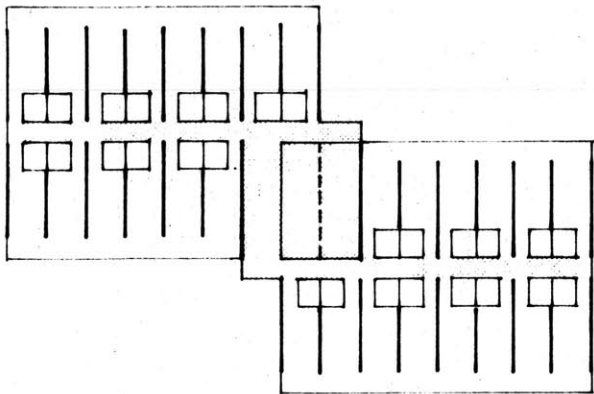
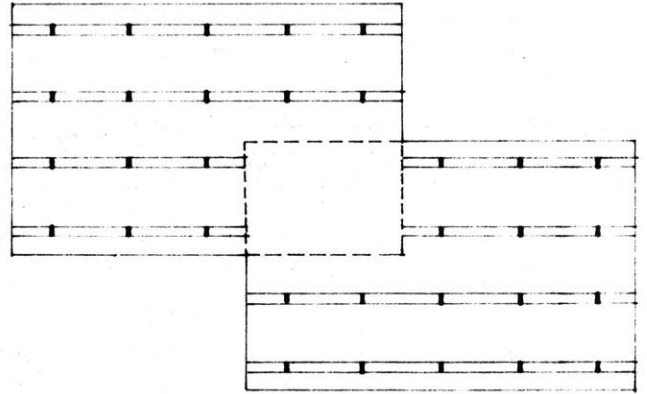
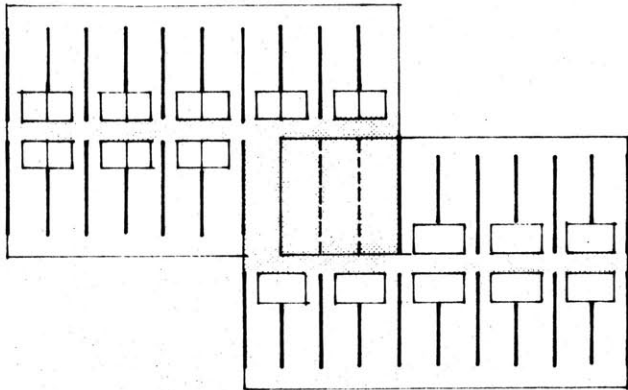
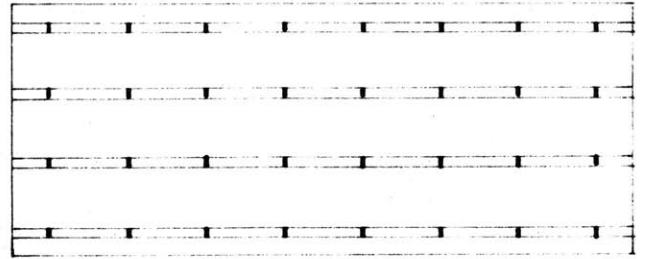
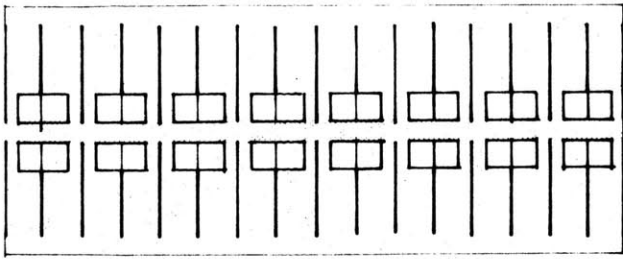
**STEEL PLATE**  
**1/2" BOLTS**  
**GROUT FILLING**

**TILES**  
**TILE TO COVER CONNec.**  
**STEEL PLATE**

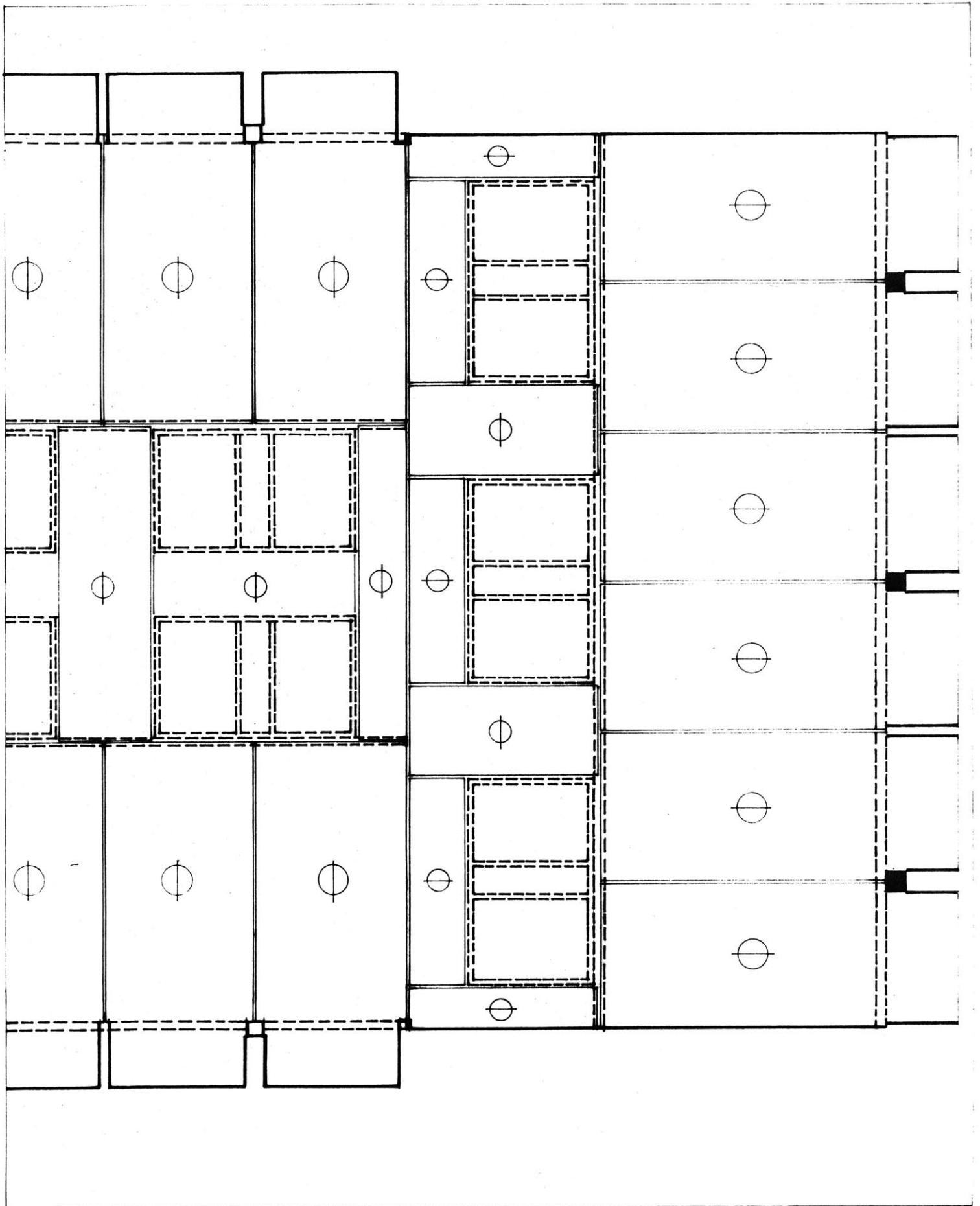




HOTEL LAYOUTS- CORRESPONDING GROUND FLOOR STRUCTURES

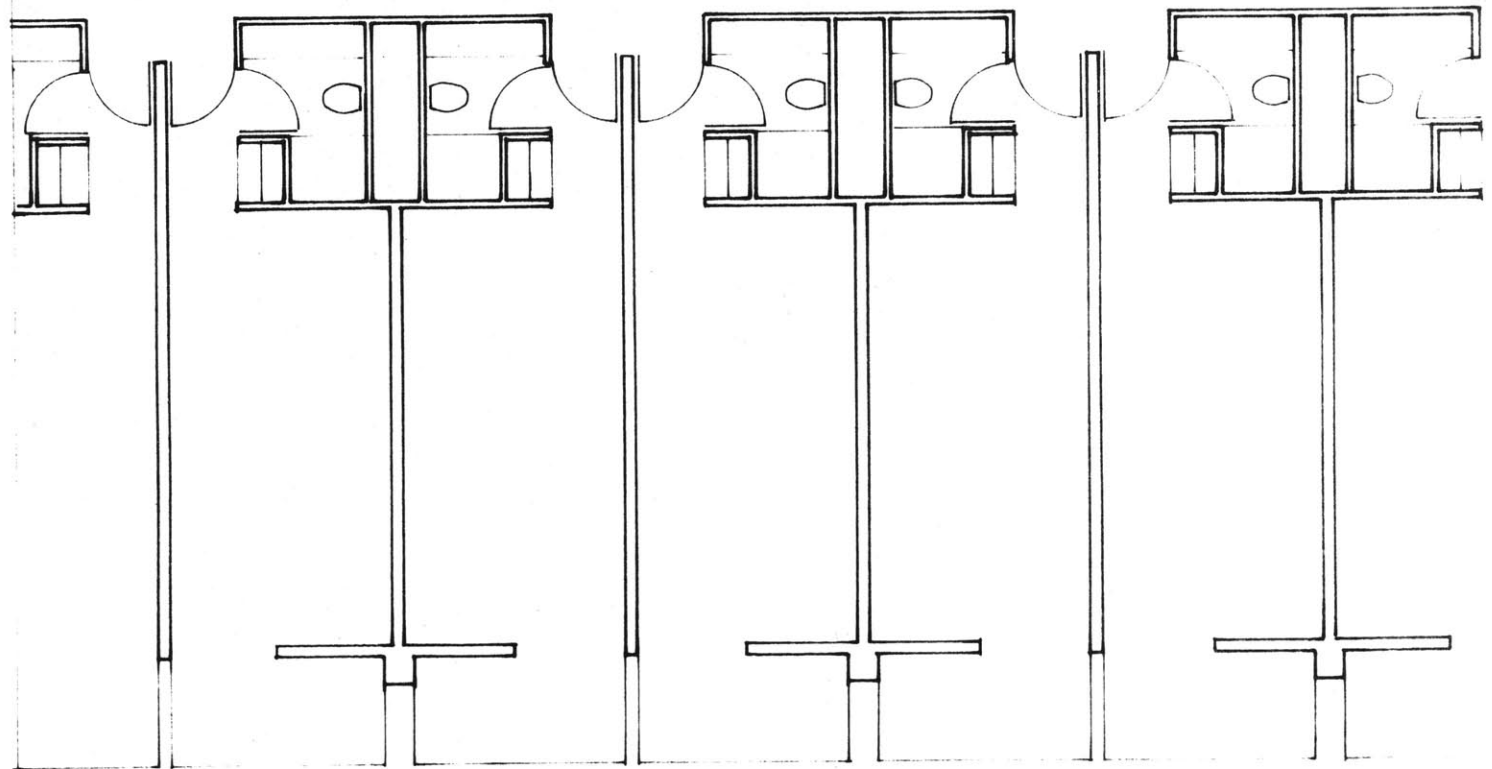
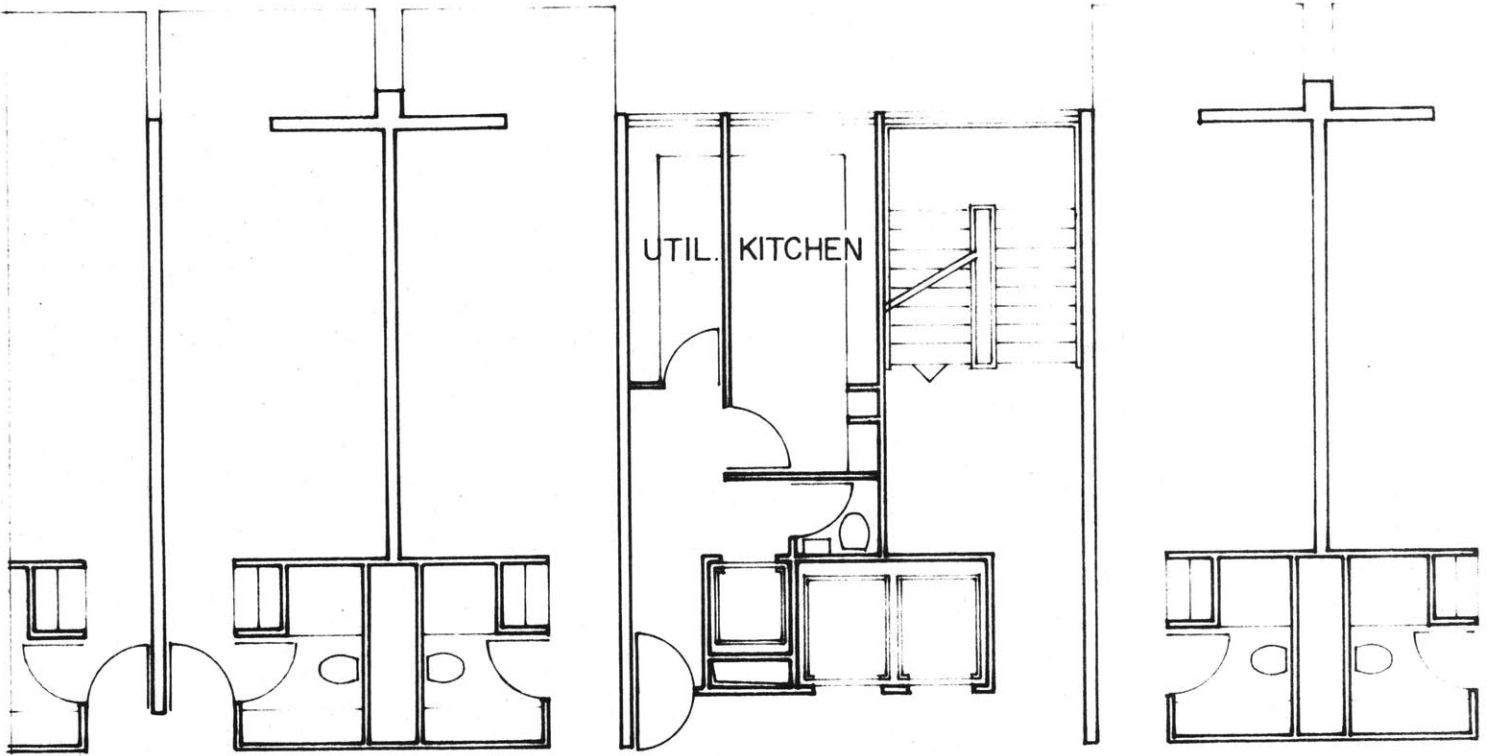


HOTEL LAYOUTS - CORRESPONDING GROUND FLOOR STRUCTURES



POSSIBLE END CONFIGURATION

STRUCTURE



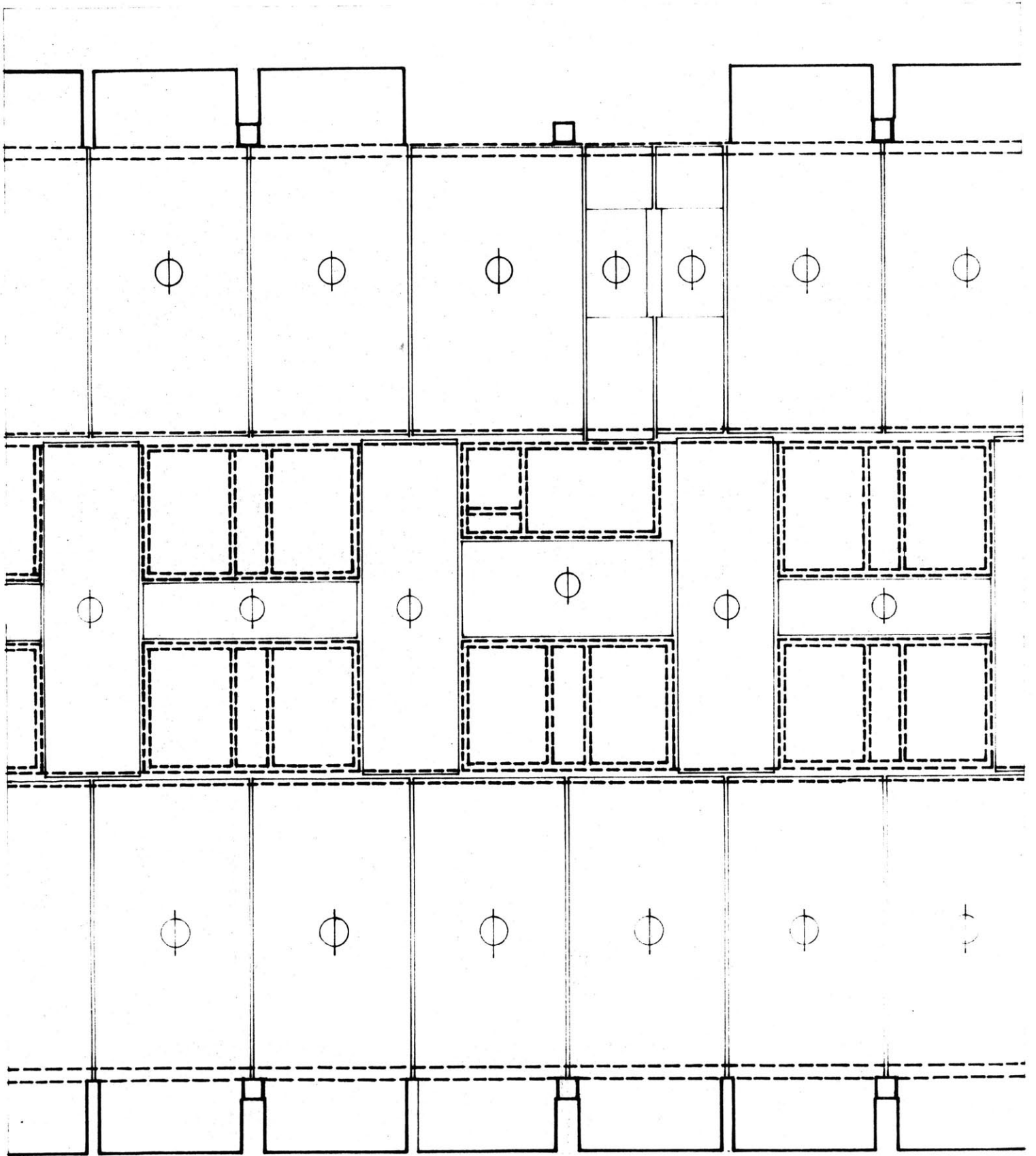
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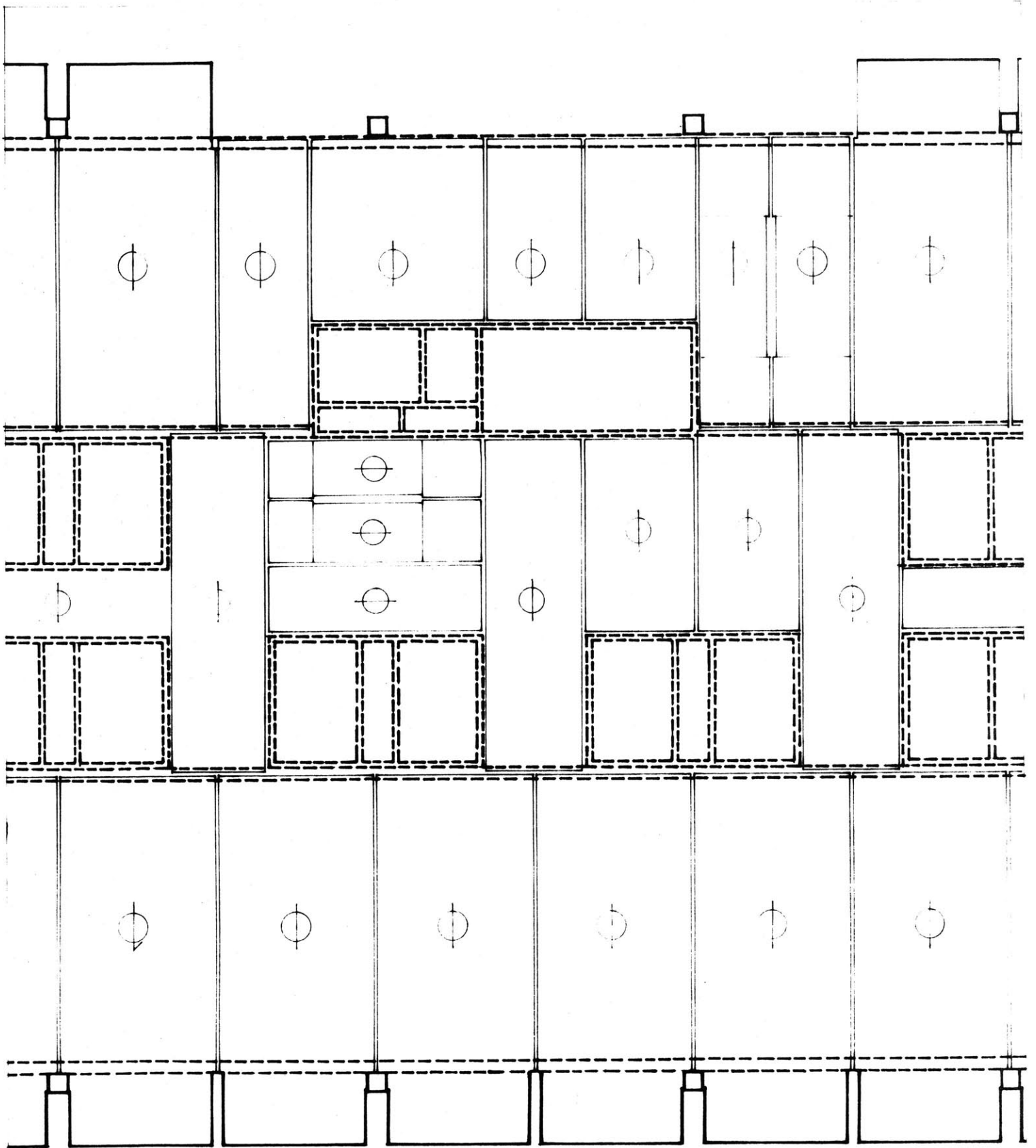
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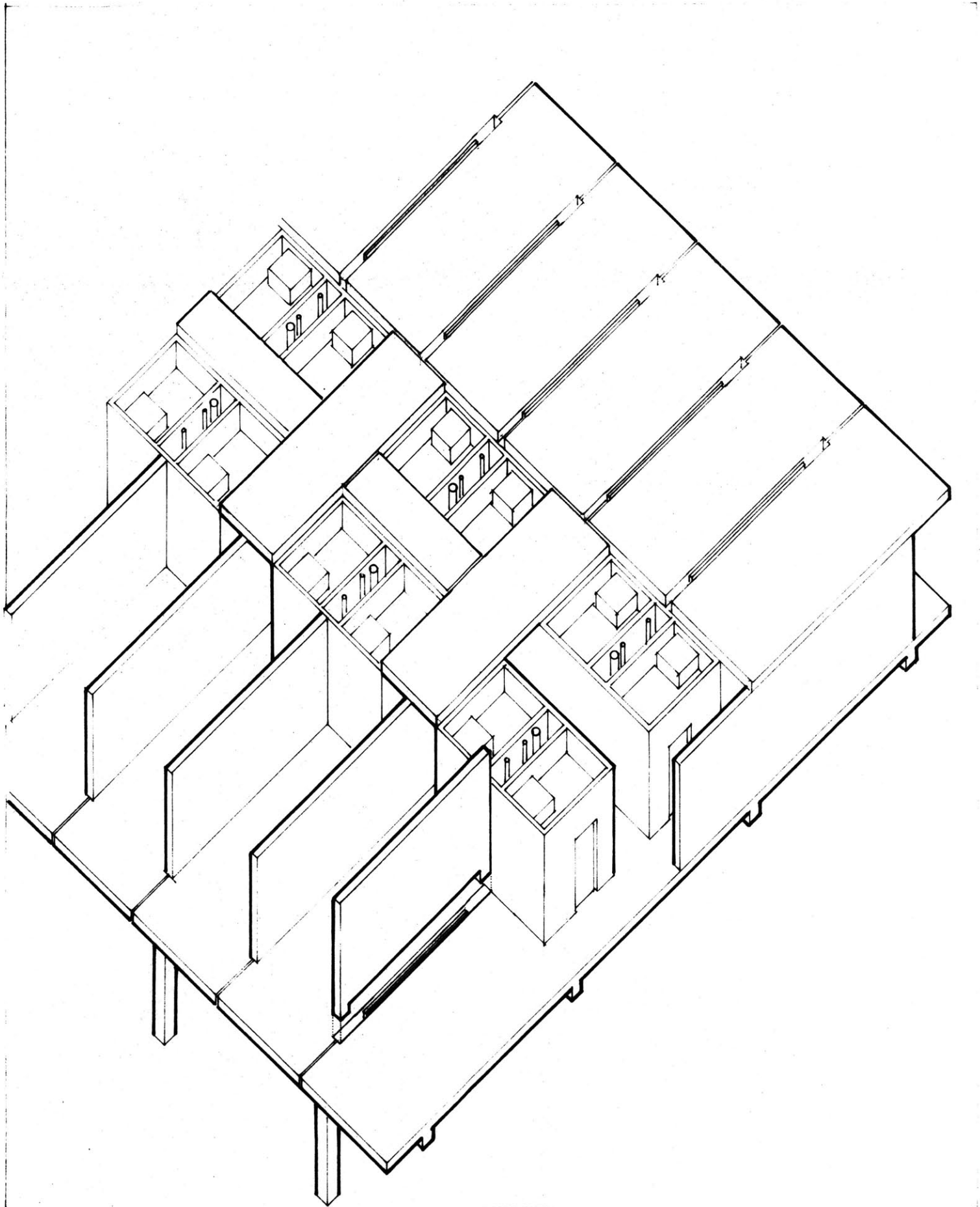
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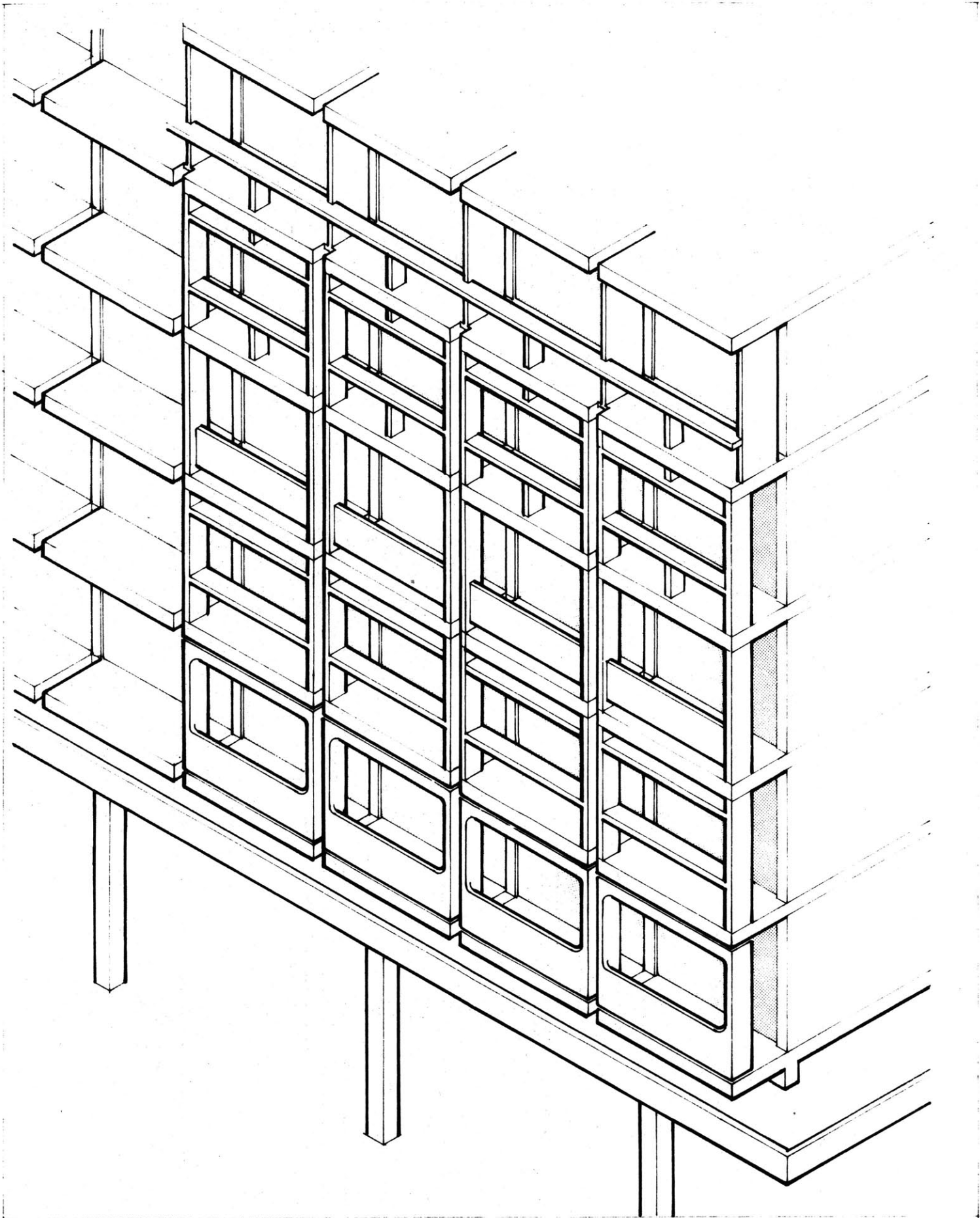


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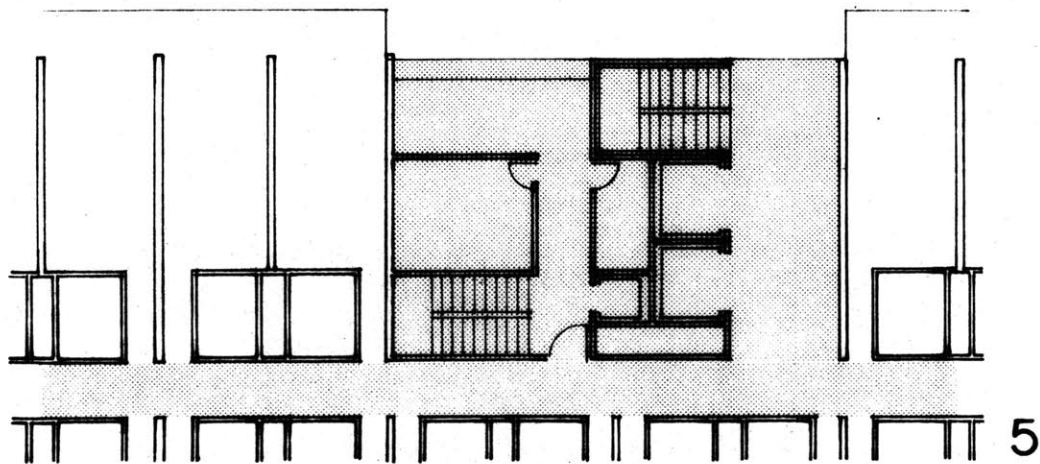
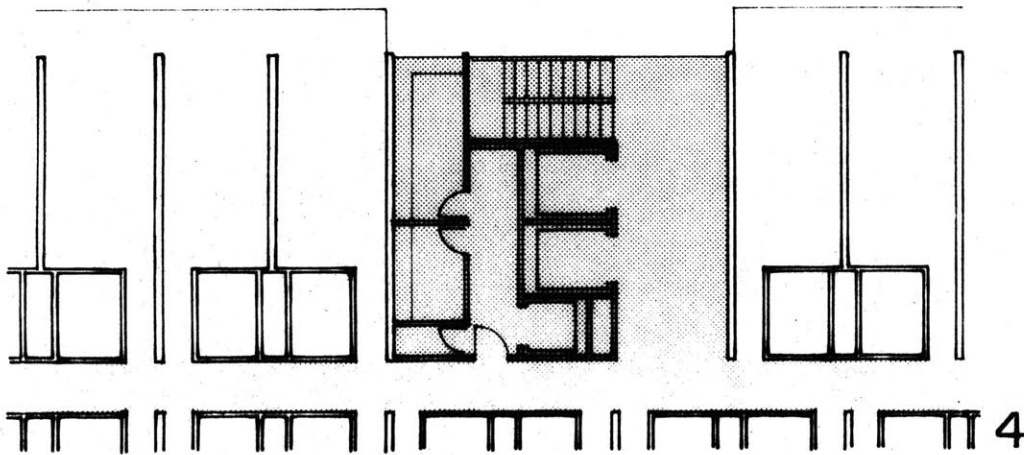
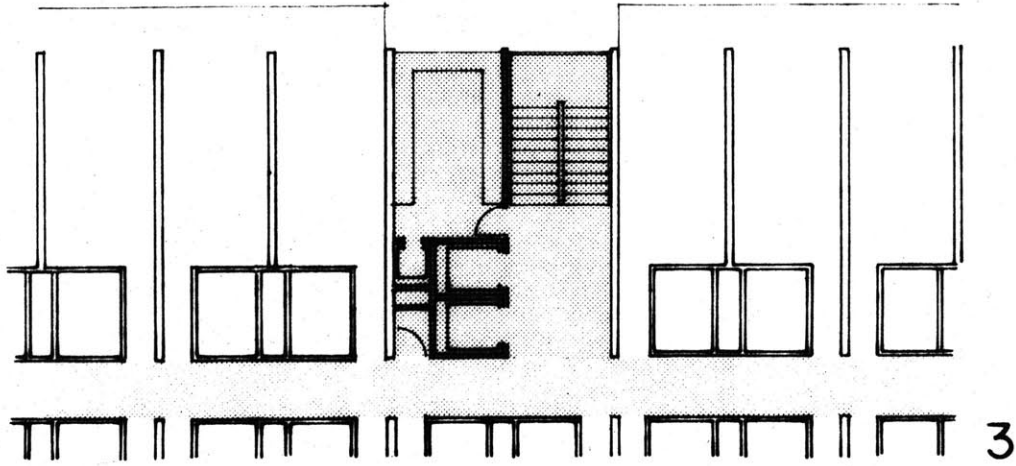
STRUCTURE



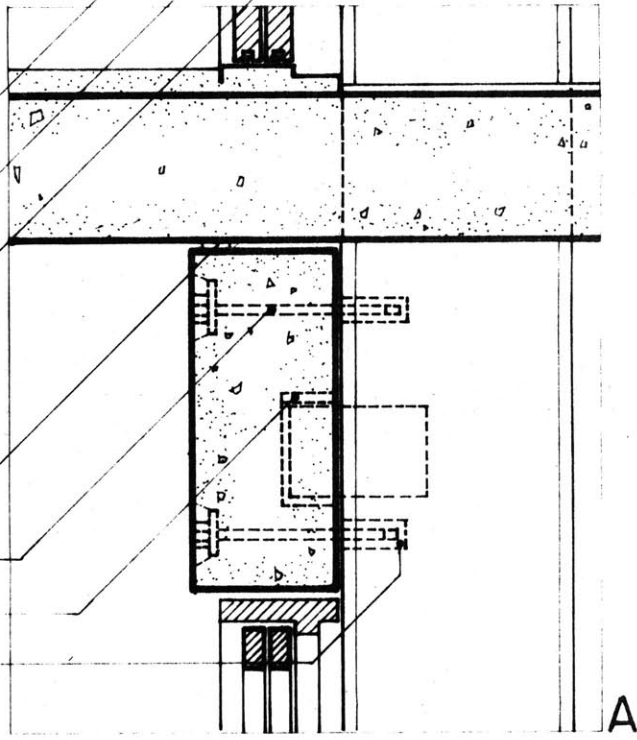
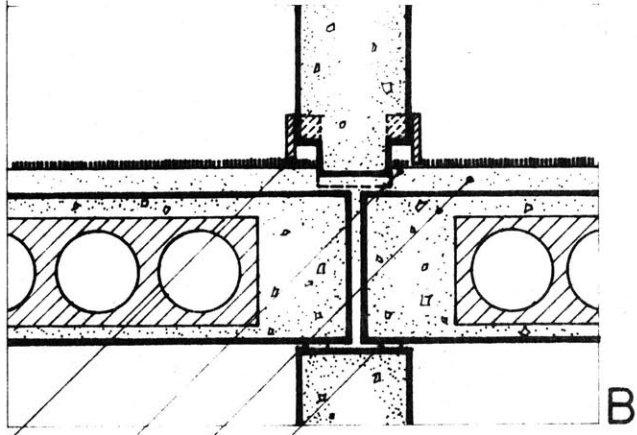
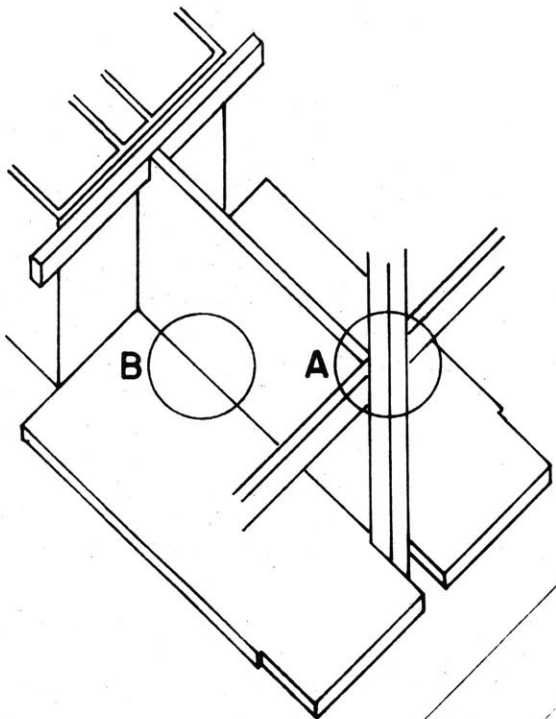
ALTERNATIVE STRUCTURAL SYSTEM - BEARING CROSS-WALLS



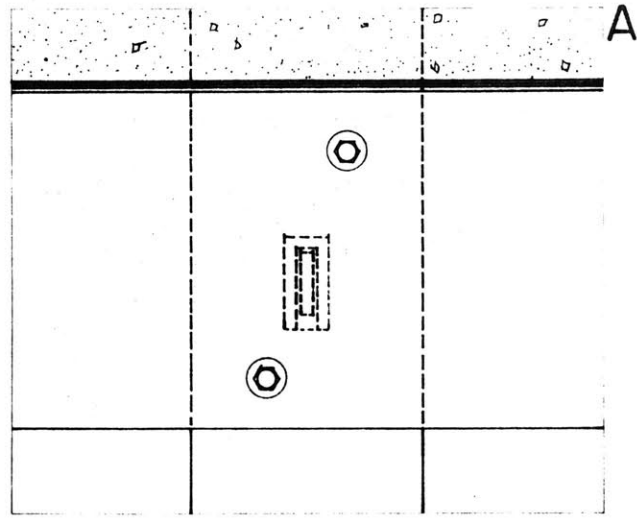
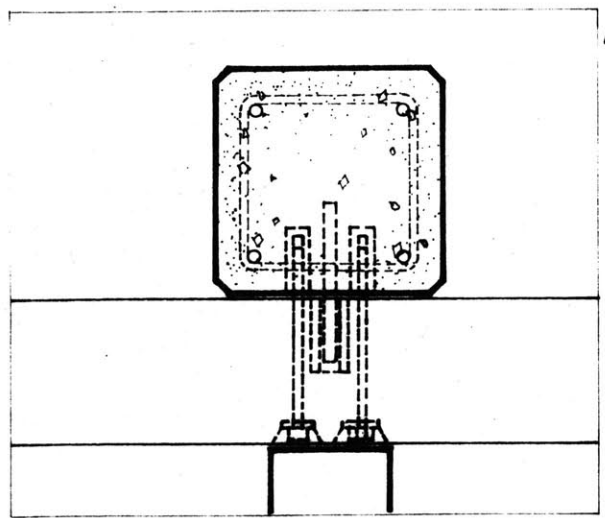
ELEVATION CONFIGURATIONS - CONCRETE COMPONENTS



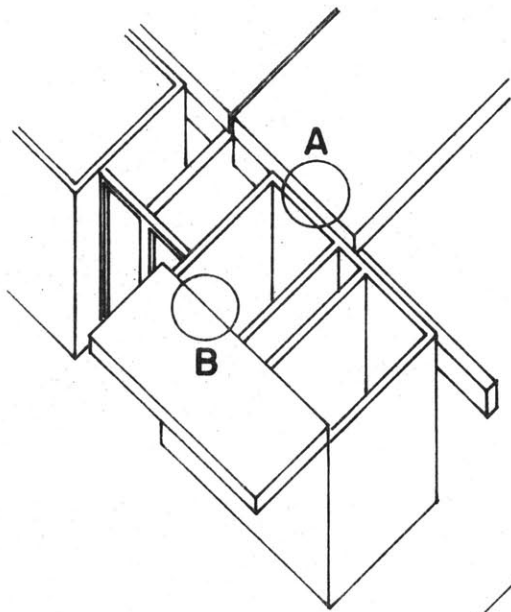
VERTICAL CIRCULATION CORES TYPES 3,4,5



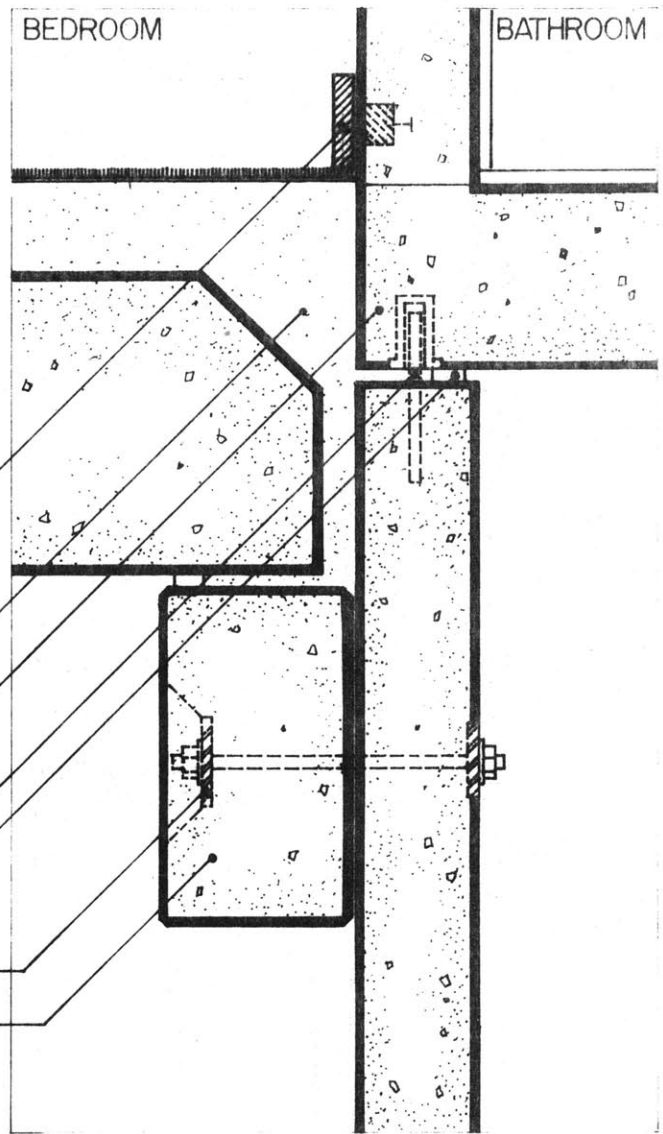
- WOOD BASEBOARD
- ELECTR. WIRING VOIDS
- CONCRETE TOPPING
- HARD NEOPRENE STRIP
- 1/2" BOLTS
- U SHAPED STEEL SEAT
- THREADED INSERTS



STRUCTURAL DETAILS

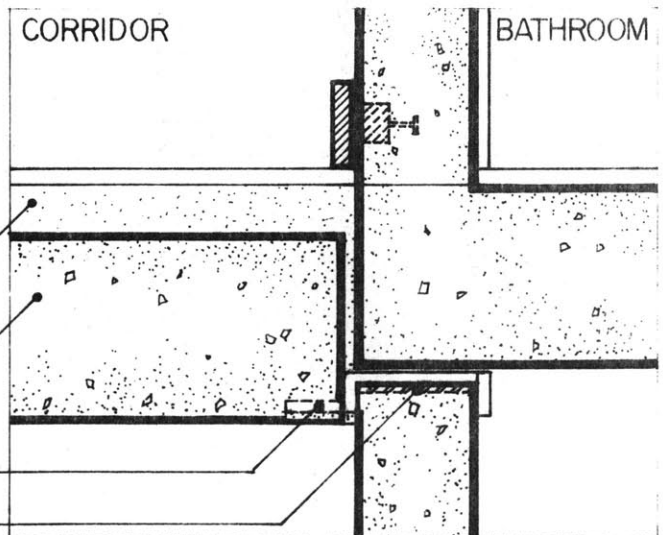


- WOOD BASEBOARD**
- CONCRETE TOPPING**
- BATHROOM UNIT**
- ALIGNMENT ROD**
- HARD NEOPRENE STRIP**
- EMBEDED STEEL PLATE**
- ROOM SLAB SUPPORTING BEAM**



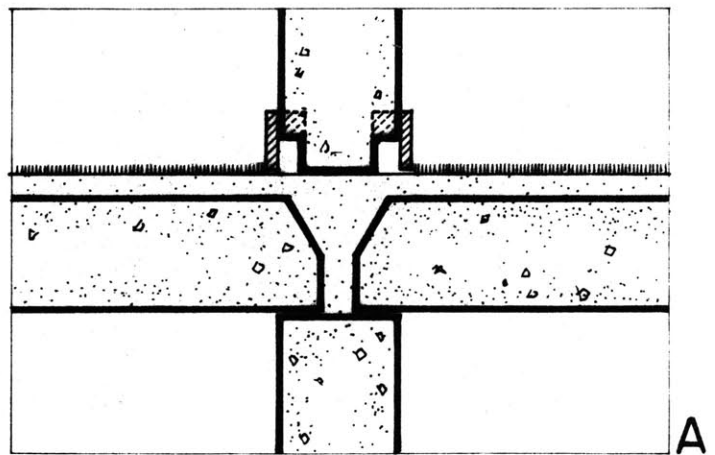
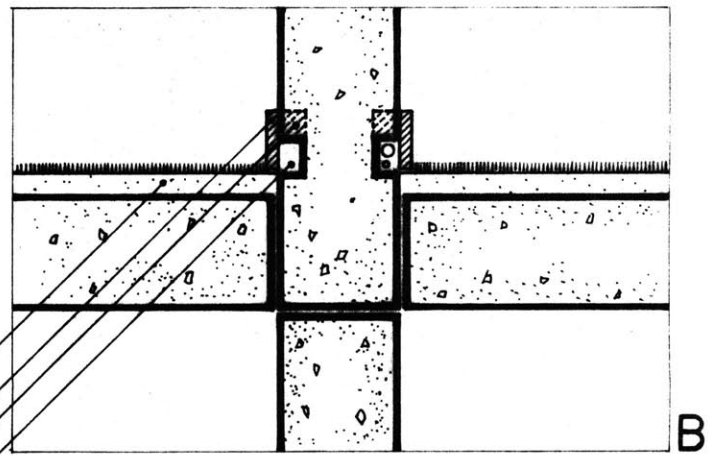
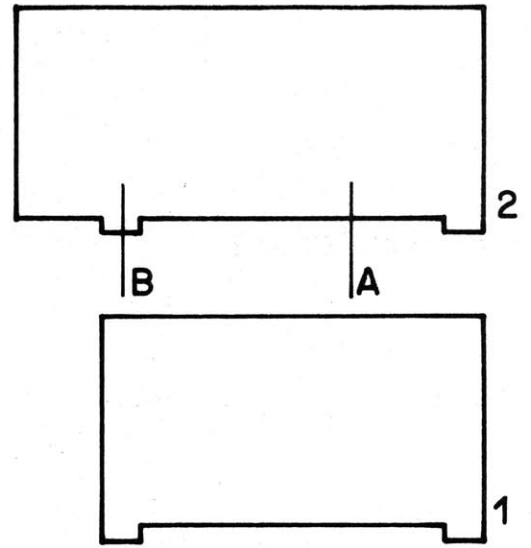
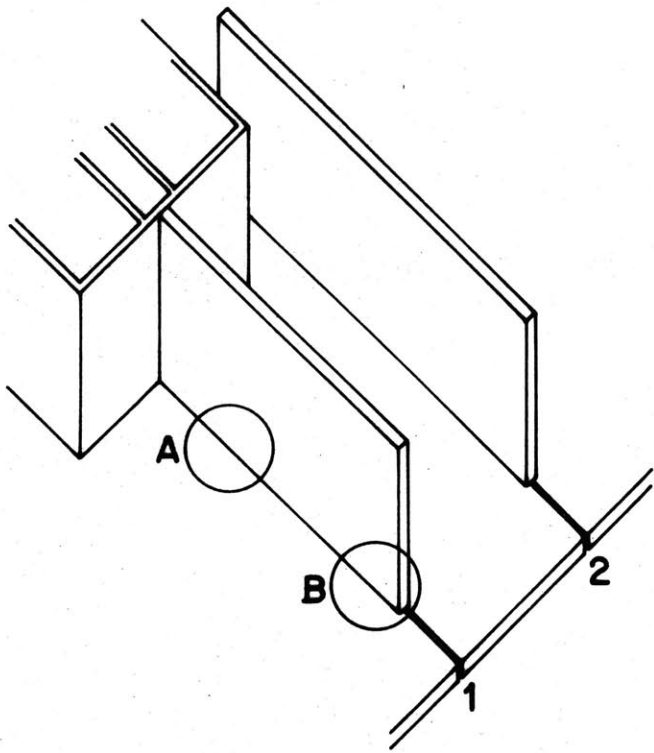
**A**

- CONCRETE TOPPING**
- CORRIDOR SLAB**
- STEEL CONNECTOR WELDED TO STEEL PLATE**



**B**

**STRUCTURAL DETAILS**



CONCRETE TOPPING  
 WOOD BASEBOARD  
 WOOD PLUGS  
 ELECTR. WIRING VOID

STRUCTURAL DETAILS

BEARING WALL STRUCT. SYSTEM