

Análise Arquitetônica

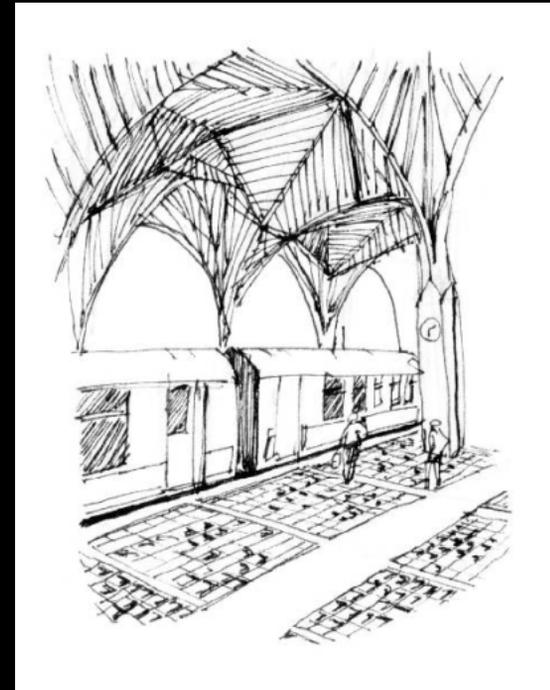
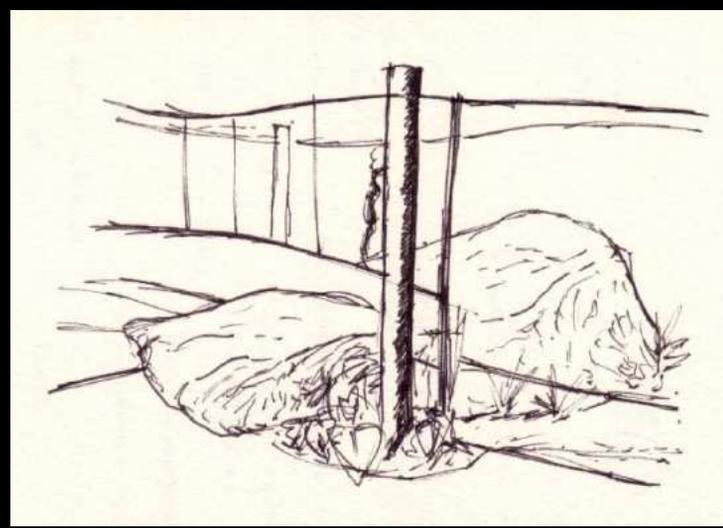


PUC-Rio

Prof. Rodrigo Cury

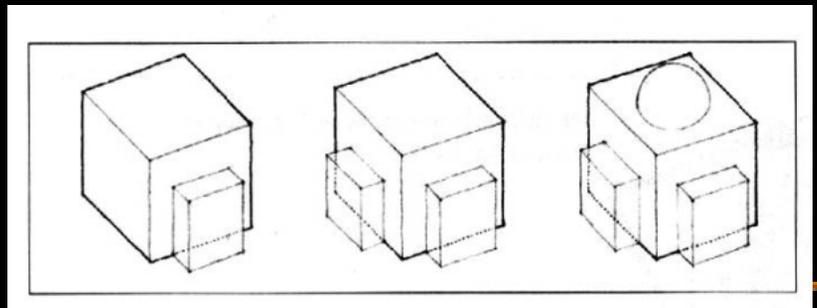
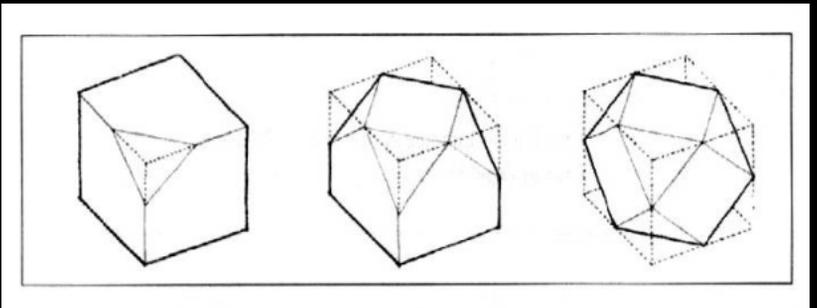
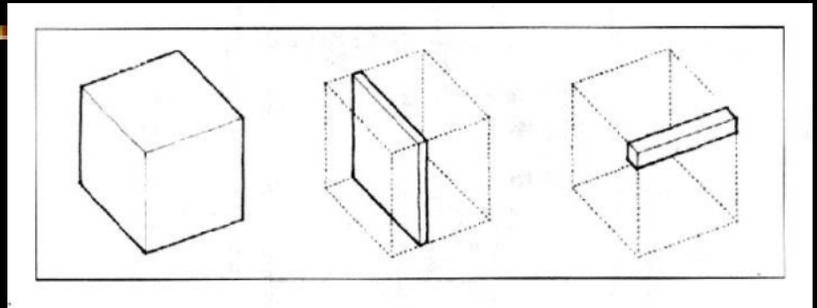
desenhos

- habilidade de desenhar
 - talento
 - técnica
 - repetição
 - prazer



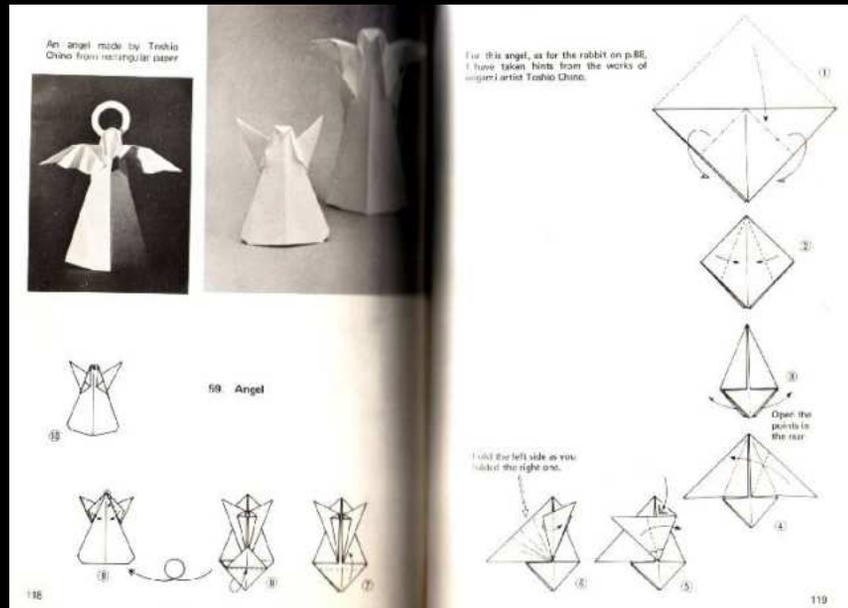
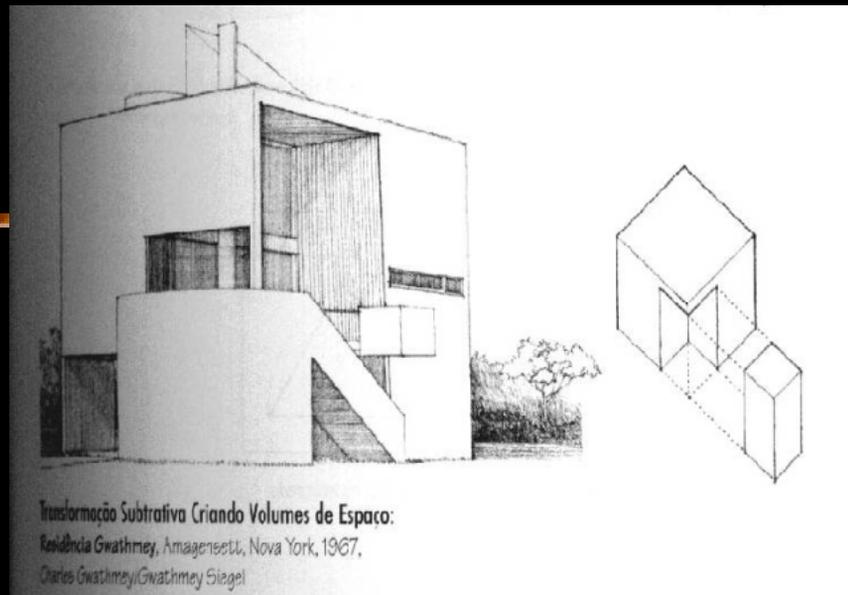
pensamento gráfico

- imaginar pelo desenho
 - testar hipóteses
 - perceber relações

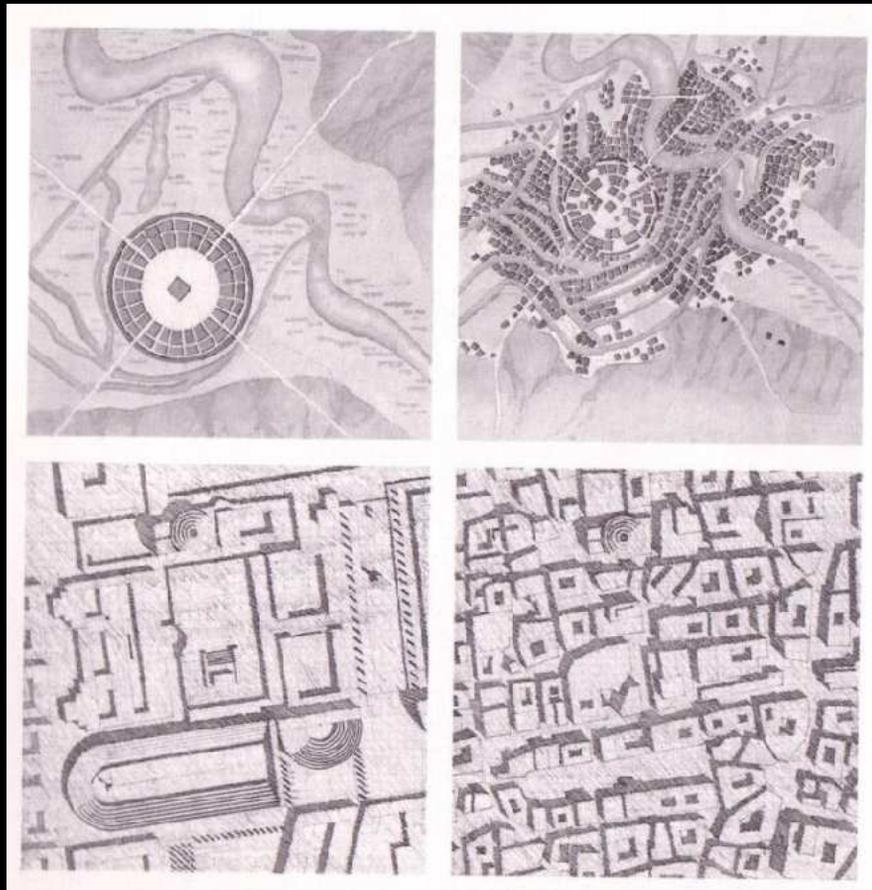
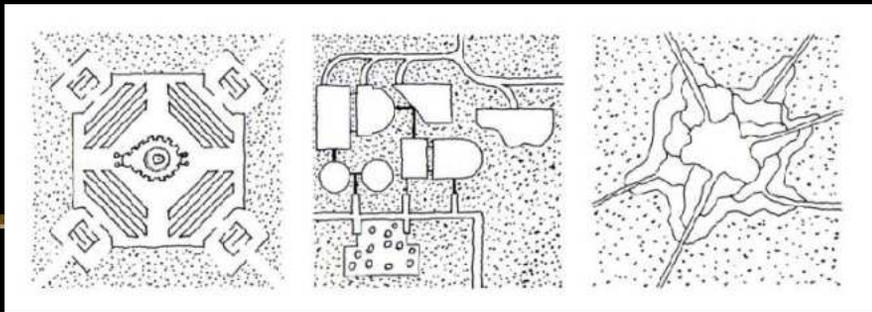


análise gráfica

- narrar a gênese da forma
- perceber as relações entre as partes
- enfatizar características do espaço
- desenhar para perceber



análise gráfica



1) Esquemas das cidades cósmica, pragmática, orgânica.

2) Bagdá e Roma em dois momentos.

KOSTOF, Spiro. The City Shaped. Boston: Bulfinch Press, 1999.

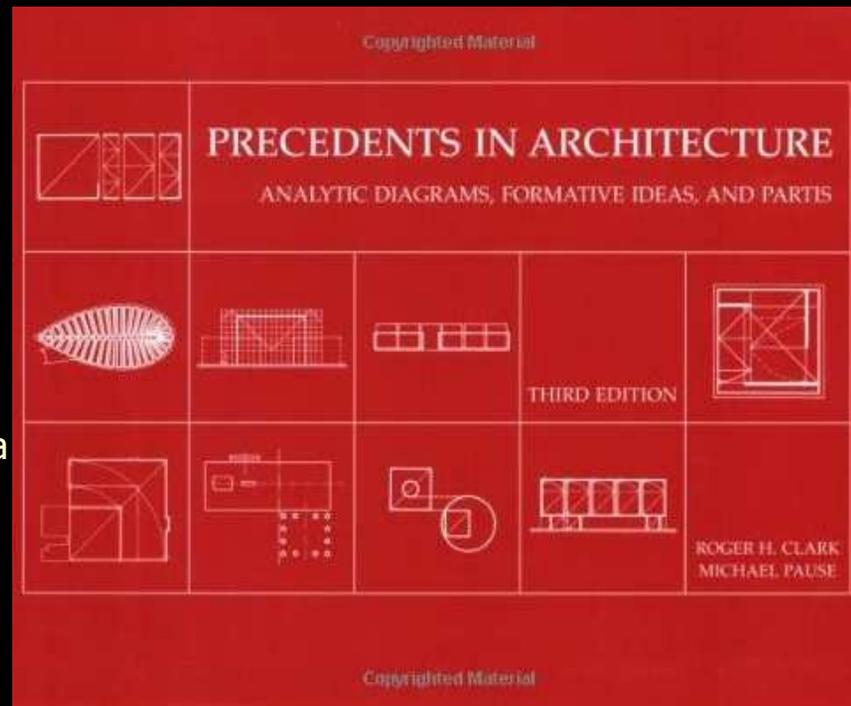
análise arquitetônica - gráfica

- Clark e Pause
 - Unwin
 - Ching
 - Baker

 - exemplos
-

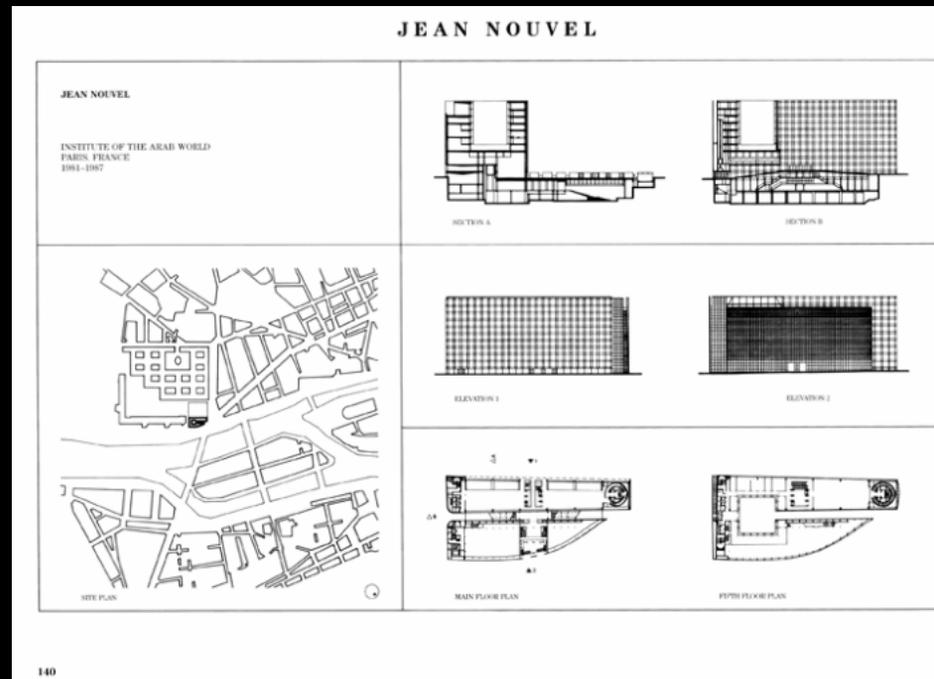
Clark e Pause

- CLARK, R. H.; PAUSE, M.
**Precedents in Architecture:
Analytic Diagrams,
Formative Ideas, and Partis.**
3ª. ed. New York: Wiley, 2004.
- objetivo
 - estabelecer comparações gráficas entre obras arquitetônicas
 - buscar os esquemas formativos
- metodologia
 - mesmo conjunto de categorias
 - mesma notação gráfica, com intensa simplificação/abstração dos desenhos
 - linhas pretas, hachura cinza



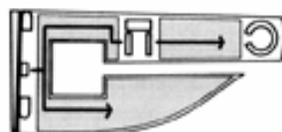
Clark e Pause: resumo

- elementos de análise
 - estrutura
 - luz natural
 - massa
 - planta-seção
 - unidade-conjunto
 - circulação-uso
 - repetitivo x único
 - geometria
 - simetria e equilíbrio
 - adição e subtração
 - hierarquia
 - partido (resumo conceitual)

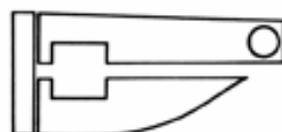




STRUCTURE



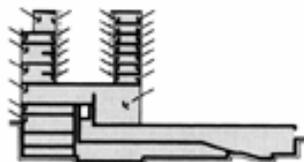
CIRCULATION TO USE



UNIT TO WHOLE



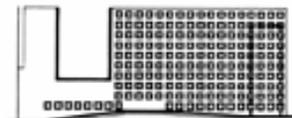
ADDITIVE AND SUBTRACTIVE



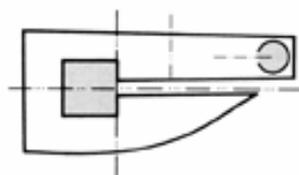
NATURAL LIGHT



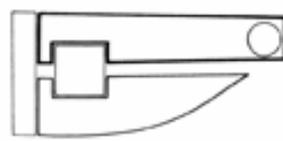
PLAN TO SECTION



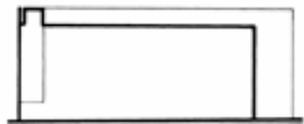
REPETITIVE TO UNIQUE



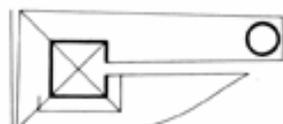
SYMMETRY AND BALANCE



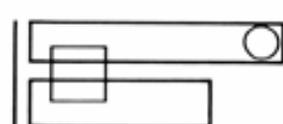
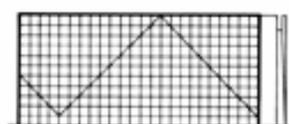
HIERARCHY



MASSING



GEOMETRY



PARTS

1. FLOREY BUILDING
JAMES STIELING
1966

2. ADULT LEARNING LABORATORY
ROMALDO GIURGOLA
1972

3. CAMBRIDGE HISTORY FACULTY
JAMES STIELING
1964

4. THE PALACE OF ASSEMBLY
LE CORBUSIER
1963-1963

5. TEMPLE OF THE SCOTTISH RITE
JOHN RUSSELL POPE
1910

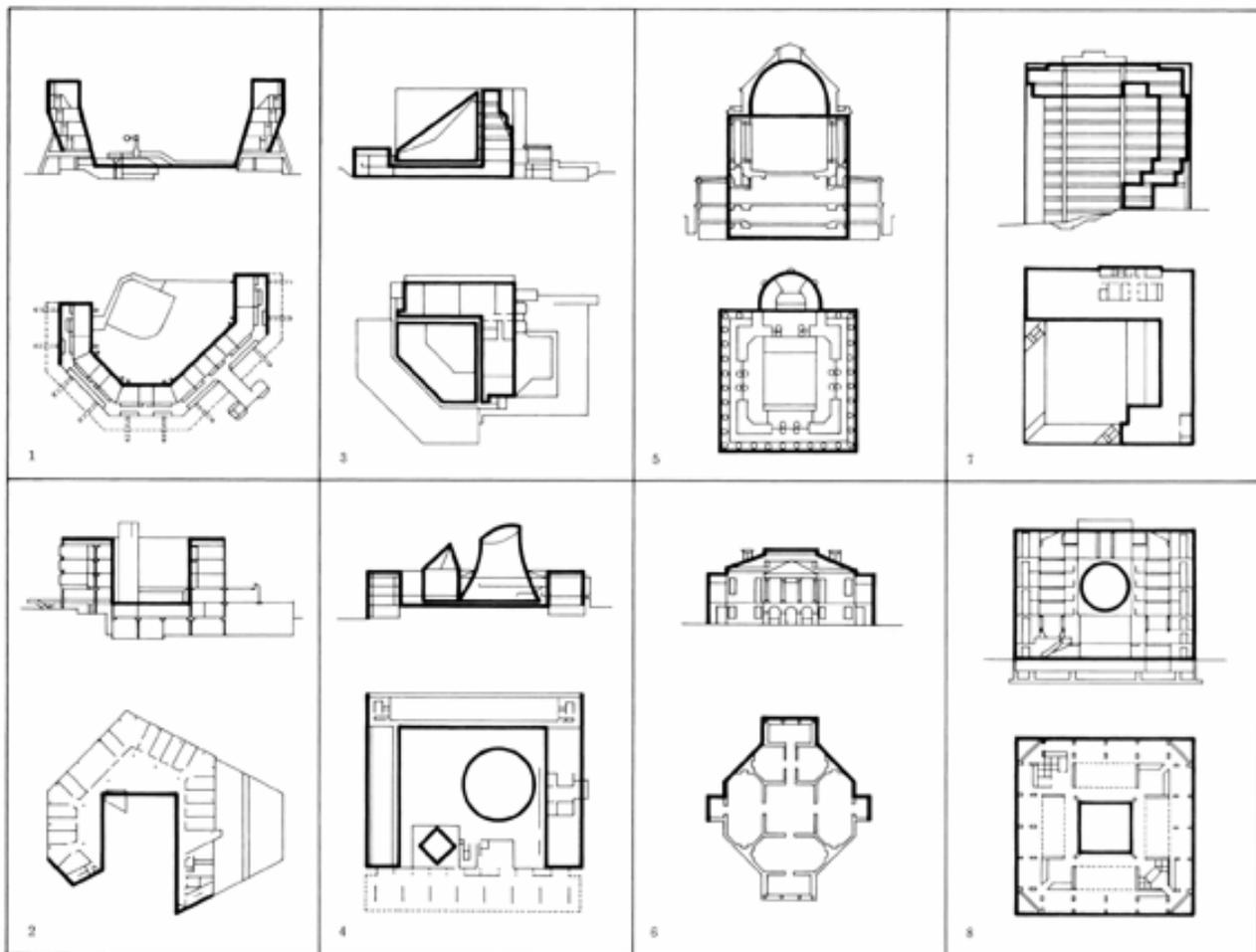
6. POPLAR FOREST
THOMAS JEFFERSON
c. 1806

7. THE FORD FOUNDATION BUILDING
ROCHE DENKELOO
1963-1968

8. EXETER LIBRARY
LOUIS I. KAHN
1967-1972

Analogous

An analogous relationship exists between plan and section when the configuration of one generally resembles the shape of the other. Differences in form language, size, location, or irregular increments of change may account for the resemblance rather than equivalence. The Florey Building (1) and Adult Learning Labs (2) have 'U-shaped configurations in plan and section. Differences in size occur between plan and section in the Scottish Rite (5), Poplar Forest (6), Salvation (9), and Sullivan's bank (16). In the Hines House (13) size differences occur in two directions. Increment changes account for the variations in plan and section in the Ford Foundation Building (7), Fallingwater (14), Wolfsburg Cultural Center (15), Enso-Gutzeit (17), and the Besançon theater (18). Plan and section differ by form language in Exeter Library (8), Sever Hall (10), and Redentore Church (11). Location shift renders the plan of St. Clement Danes (12) somewhat different from the section. A combination of form language and size changes create the variation in the Palace of Assembly (4). Form language and increment changes make the plan and section of the History Faculty Building (3) analogous, rather than equal.



Unwin

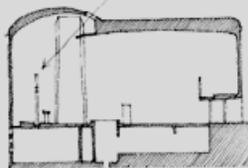
- UNWIN, S. **Analysing Architecture**. 2ª. ed. Londres: Routledge, 2003.
- objetivo
 - identificar elementos chave e temas conceituais da arquitetura
- metodologia
 - ao longo/a partir do texto, croquis em linha fina ressaltando elementos, mostrando exemplos (perspectivas, cortes, fachadas, plantas), ilustrando ideias e estabelecendo comparações



Unwin: resumo

- Arquitetura: identificação do lugar e enquadramento das ações humanas
 - elementos básicos
 - área, marcador, barreira, teto, elo, porta, caminho, abertura, fechamento
 - modificações
 - luz, cor, temperatura, ventilação, som, odor, textura, escala humana, tempo
 - elementos de múltiplas atribuições
 - incluindo a função simbólica
 - elementos preexistentes
 - lugares primitivos
 - fogareiro, cama, teatro, tumba, altar, fortificação, trono, ...
 - geometria do ser
 - geometria biológica (linhas de visão, linhas de passagem, escala humana, presença, direções)
 - geometria social (acolhimento, confronto, encontro)
 - geometria do fazer (materiais)
 - geometria ideal
 - relação entre estrutura e espaço
 - paredes paralelas
 - estratificação
 - do chão ao topo
 - templo e cabana
 - monumental x humano
 - artificial x mundo natural
 - eternidade x presente
 - forma ideal x contingente
 - transição, hierarquia, centro
 - ver também:
 - RASMUSSEN, S. E. *Arquitetura vivenciada*. São Paulo: Martins Fontes, 1986.
-

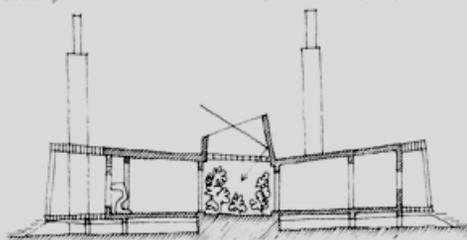
MODIFYING ELEMENTS OF ARCHITECTURE



The sources of daylight in religious buildings are often indirect or hidden, to increase their sense of mystery.

The same sort of effect is used in this crematorium at Borås, Sweden, by Harald Ericson (above). It was built in 1957, three years after the Ronchamp chapel. The drawing shows its long section, with a concealed source of daylight over the sanctuary.

In the same year, Ralph Erskine used a roof-light cum light scoop to identify the place of a small winter garden in the middle of a single-storey villa which he built at Storvik, also in Sweden (below).



In this villa in Sweden, Ralph Erskine used a roof-light to identify the place of a small winter garden at the heart of the house.

Light from an electric bulb is more constant and controllable than daylight: it can be switched on and off, or precisely varied in intensity, colour and direction. One of the

A spotlight can identify the place of anything upon which one wishes to focus attention.



most intense uses of electric lighting is in the theatre, but any place can be considered as a 'theatre' and lit accordingly.

A spotlight can identify the place of an actor, a singer, a painting, an object... anything on which attention is to be focused.

Beams of light can also work in the opposite way, drawing attention to their source.

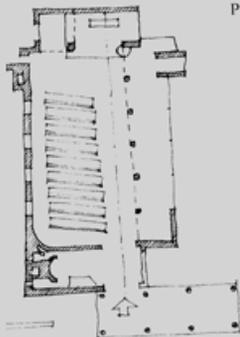


In identifying places through architecture, light – both the varying light from the sky and the precisely controllable light from electric bulbs – can contribute in many ways.

The way light contributes to the identification of place is part of architecture. Decisions about light play their part in the conceptual organisation of space and affect the ways basic elements of architecture are used.

Light contributes to the character and ambience of a place. One is likely to make the quality of light in places of contemplation or worship different from that in places for playing basketball or for performing surgical operations.

PRIMITIVE PLACE TYPES

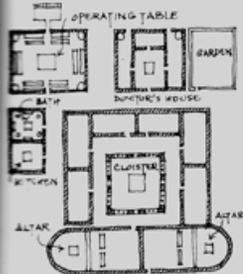


When "She then drew a polished table to their side, and the staid buskeeper brought some bread and set it by them with a choice of dainties, holding them liberally to all the could offer. Meanwhile a carver dished up for them on platters plates of various meats he had picked from his board, and put gold caps beside them, which a steward filled up with wine as he passed them on the frequent rounds."

In the Cemetery Chapel at Turku, Erik Bryggman experimented with a new symmetrical arrangement about the axis of the altar.

The Cemetery Chapel at Turku in Finland (above), designed by Erik Bryggman and built in 1941, has an asymmetrical plan but the altar remains the focus of the building. Attention is drawn to it by the axis of the entrance and the pathway leading to it (as in more traditional church plans), but in making an asymmetrical layout the architect recognised the relationship between the inside of the church and the outside. The context of the church is not symmetrical; the layout allows the sun in to illuminate the altar alcove and the congregation to look out through the glass south wall.

Some things in architecture, without actually being altars, can be like them. This is a part of the old plan for the Abbey of St Gall in Switzerland (left). It dates from the



In the abbey of St Gall the operating theatre had a layout similar to a chapel, making the operating table like an altar. The old plan, from which this portion is taken, is displayed on its own 'altar' in the Stiftsbibliothek in St Gallen, Switzerland.

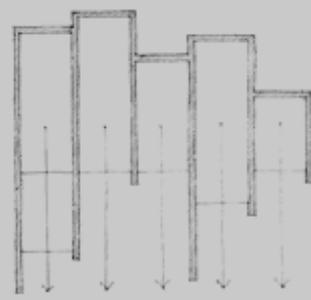
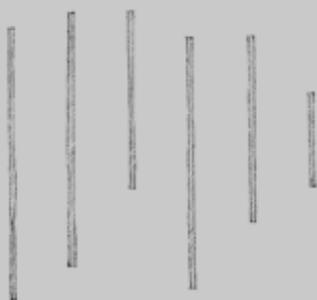
ninth century AD, and shows the intended infirmary. The operating table has the same sort of architectural relationship with its room as the altars in their chapels.



Many ordinary everyday things can be like altars. When someone devotes a table to memorabilia of a favourite football club, it can be like an altar.



Altar Aalto's design for the Vuokosenkirkko Church at Imatra in Finland is asymmetrical in its plan. But still, by various means, the building focuses on the altar.



The diagrams and drawings along the top of this and the opposite page illustrate a house in Switzerland designed by Dolf Schnebli built in the early 1960s. The section through the house shows that its structure is composed of five barrel vaults supported on six walls. These walls form the structural order and the basis of the spatial organisation of the house. In the ancient tradition, each of the spaces between the walls is given a single directional emphasis by one end being closed with a cross wall. The other end is visually open but sealed against the weather by a glass wall. The places of the house are disposed within this matrix of parallel walls. Some are accommodated between walls (the bedrooms for example); some stretch across more than one bay of space, necessitating the removal of some portions of the walls from the structural diagram. The hearth is positioned as an additional place identifier, across the structural grain. There is a terrace, also defined by the walls.

approach zone; then the living zone, which accommodates the living room, dining room, kitchen, bedroom and also the car port; then a shaded terrace; and finally the fourth zone, which is open to the sea. In this house a reinforced concrete roof is supported on rough stone piers. The hearth divides the living from the dining places; the roof-pier by the entrance has been turned through ninety degrees to allow access for the car.

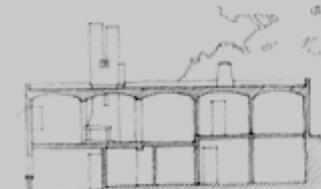
The parallel-wall house below was designed by Norman and Wendy Foster with Richard Rogers. The sense of movement from entrance to terrace is with the grain of the walls, which run down a sloping site. Here there are three zones created by the four walls: the zone for meeting people, which includes the study, dining room and living room; an intermediate zone for the conservatory, kitchen and playroom; and a private zone for the bedrooms.



Reference for Greek summer house by Aris Konstantinidis;
World Architecture 2, 1965, p.128.



The next house also uses more than one bay of space in a parallel wall plan. It is a summer house on the coast of Africa,

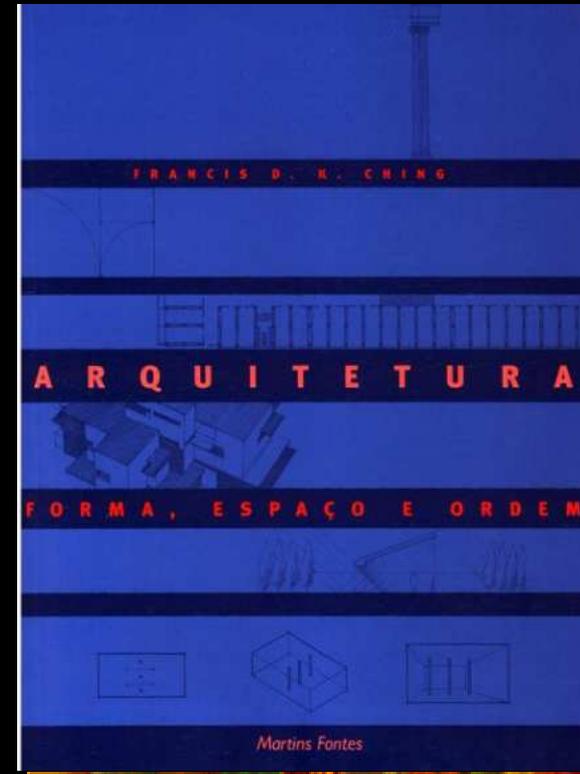


Reference for
World Archi

See
with parallel
with layout
has been d
The
the ground
building is
the south
spaced for
and built

Ching

- CHING, F. D. K. **Arquitetura: forma, espaço e ordem.** São Paulo: Martins Fontes, 1998.
- objetivo
 - evidenciar princípios formadores/ordenadores do espaço arquitetônico
- metodologia
 - forte sistematização geométrico-formal
 - combinação de esquemas e exemplos, através de desenhos a linha e texturizados (perspectivas, plantas, cortes, fachadas)



Ching: resumo

■ Elementos primários

- ponto
- linha
- plano
- volume

■ Forma

- sólidos
- transformações
- adições, subtrações, interseções
- forma centralizada / linear / radial / aglomerada
- malhas

■ Forma e espaço

- variações entre elementos primários e volumes, incluindo aberturas

■ Organização

- relações entre espaços

■ Circulação

- circulação
- acesso
- entrada
- via

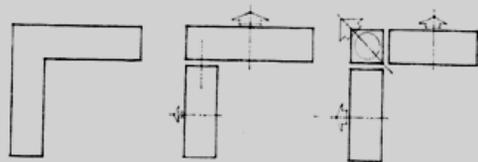
■ Proporção e escala

- materiais
- estrutura
- ordens
- modulos
- antropometria
- escala humana

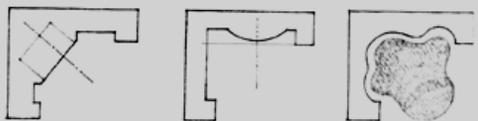
■ Princípios (de ordem)

- eixo
 - simetria
 - hierarquia
 - ritmo
 - repetição
 - transformação
-

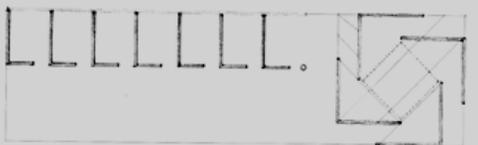
Esta forma arquitetônica pode ter uma configuração em L, estando sujeita às seguintes leituras: um dos braços da configuração pode ter uma forma linear que se encaixa no canto dentro de seus limites, enquanto o outro braço é visto como um apêndice dele; ou o outro braço pode ser articulado como um elemento independente que reúne duas formas lineares.



Um edifício pode ter uma configuração em L para estabelecer um canto de seu terreno, delimitar um espaço de espaço externo ao qual seus espaços internos se relacionam ou abrigar uma porção do espaço externo de condições indesejáveis ao seu redor.



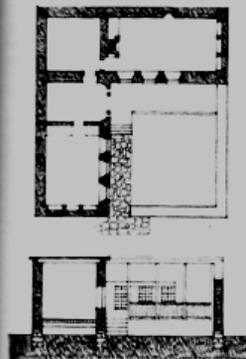
As configurações de planos em forma de L são estáveis e autoportantes e podem engrundir por conta própria no espaço. Devido ao fato de serem abertas, constituem elementos flexíveis de definição de espaço. Podem ser utilizadas em combinação umas com as outras ou junto a outros elementos, de forma a definir uma rica variedade de espaços.



Unidade Básica de Habitação

Condomínio Kingo, próximo a Eslinore, Dinamarca, 1956-63, Jørn Utzon

Um tema comum encontrado em exemplos de arquitetura residencial é a configuração de cômodos em L delimitando uma área de estar descoberta. Normalmente uma ala contém os espaços de estar comunitários, enquanto a outra contém espaços privativos, individuais. Os espaços de serviço e abastecimento geralmente ocupam uma posição de canto ou são alinhados ao longo dos fundos de uma das alas.

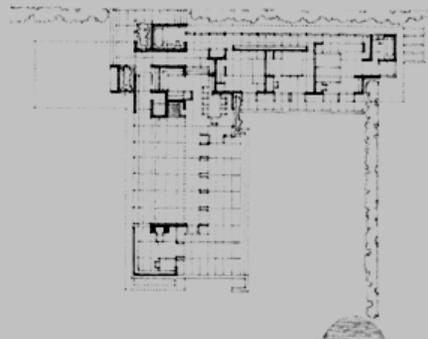


Casa Tradicional em Konya, Turquia



Planta de Situação

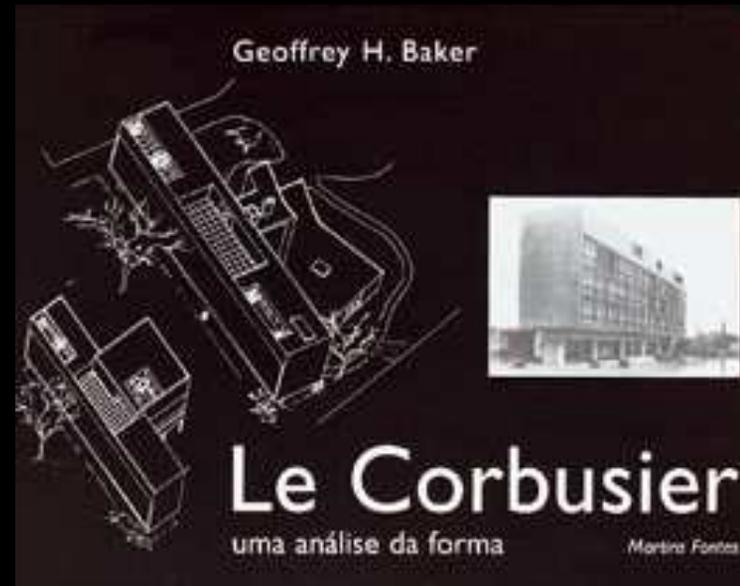
A vantagem desse tipo de disposição é o fato de proporcionar um pátio privativo, abrigado pela forma arquitetônica e ao qual os espaços internos podem ser diretamente relacionados. No condomínio Kingo, uma densidade razoavelmente alta é alcançada através desse tipo de unidade, cada qual com seu próprio espaço externo.



Casa Rosenbaum, Florença, Alabama, 1939, Frank Lloyd Wright

Baker

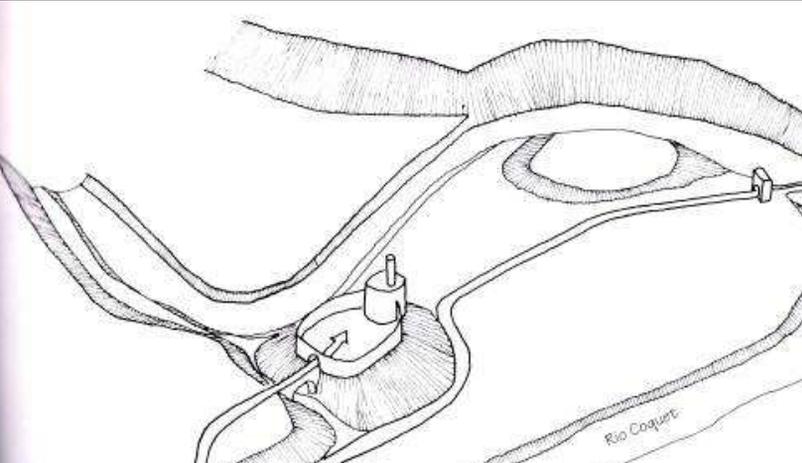
- **BAKER, G. H. Le Corbusier: uma análise da forma.** 1ª ed. São Paulo: Martins Fontes, 1998.
- objetivo
 - estabelecer relações espaciais e formais entre os projetos de Le Corbusier (além de referências externas)
- metodologia
 - aplicar categorias de análise semelhantes, mas selecionadas de acordo com cada projeto
 - derivar categorias a partir de cada análise
 - redesenhar etapas intermediárias de um projeto para evidenciar o processo projetual
 - justapor projetos considerados semelhantes para observar as relações entre eles
 - redesenhar diversos projetos segundo um mesmo código visual, composto de linha preta, com poucas texturas



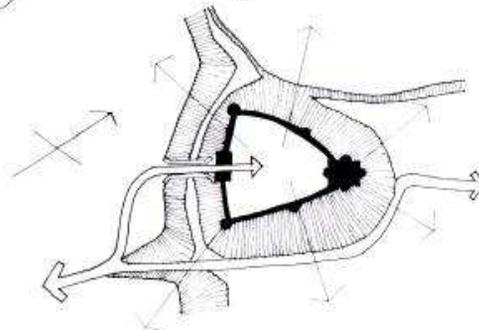
Baker

- forças do lugar
 - vistas
 - alinhamentos (ruas e edifícios)
 - orientação solar
 - forma
 - centróide - linear
 - dinâmica
 - sistemas nucleares
 - sistemas lineares
 - sistemas axiais
 - sistemas escalonados - sistemas radiais
 - sistemas entrelaçados
 - distorção da forma
-

forças do lugar



O Castelo de Warkworth, em Northumberland, é um conceito centróide localizado no topo de uma colina. Essa forma genérica é desenvolvida de acordo com as exigências específicas do programa arquitetônico e com as características de um lugar particular. Essas duas séries de condições podem ser consideradas como forças — uma força defensiva que rege o formato do castelo, o qual é afetado pela força centróide da colina e a força linear do rio.

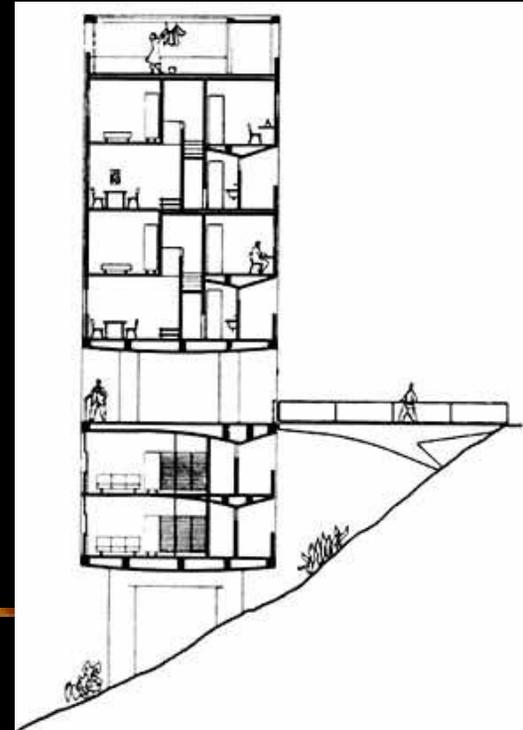


Em termos específicos, a forma se torna radial e manifesta.

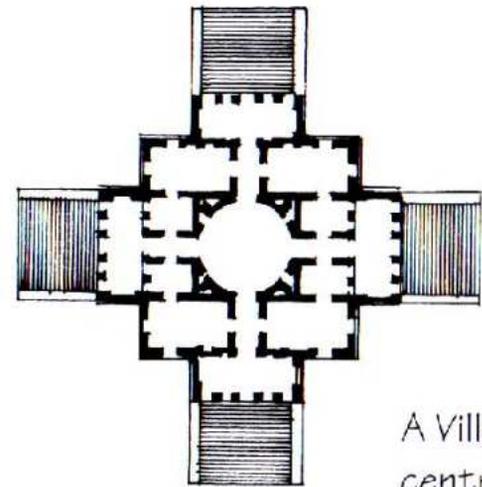
a partir de desenho de Simon Buckley

forças do lugar

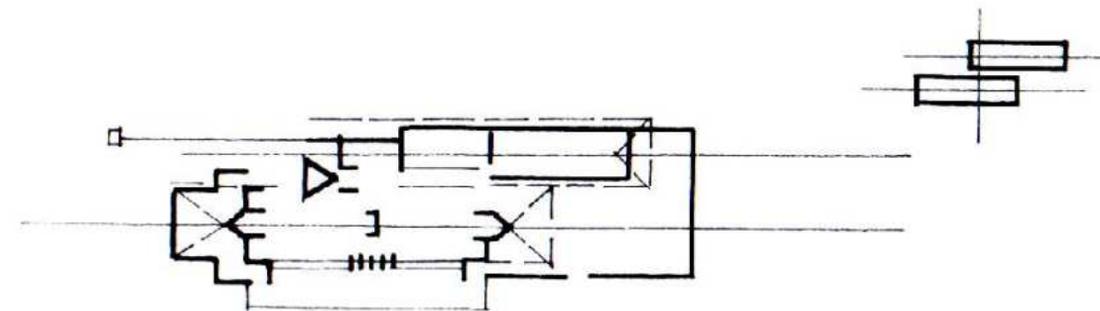
- 1) Conjunto Habitacional do Pedregulho, Rio de Janeiro (Affonso Reidy, 1946)
- 2) Conjunto Habitacional Marquês de São Vicente, Rio de Janeiro (Affonso Reidy, 1952)



forma centróide e forma linear

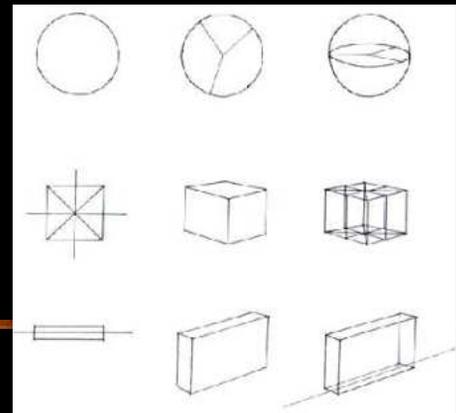


A Villa Capra, de Andrea Palladio, é um centróide quase simétrico.

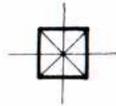
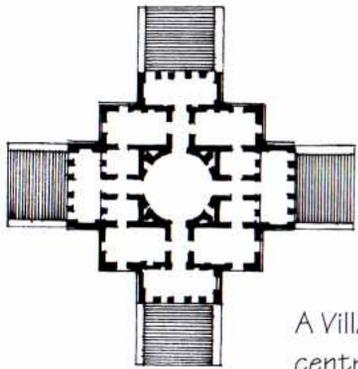


A Casa Robie, de Frank Lloyd Wright, desloca duas formas lineares em uma relação potencialmente de mudança.

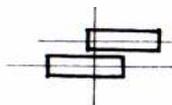
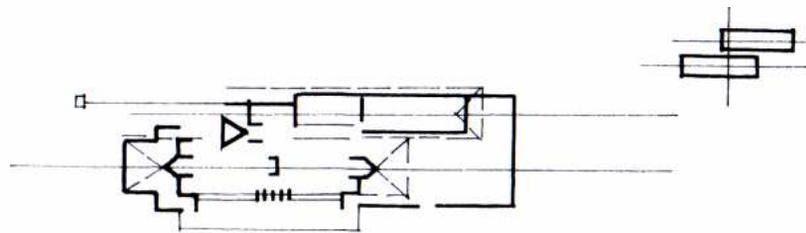
- centróide
 - repouso
 - estabilidade
- linear
 - mudança
 - atividade



forma centróide e forma linear



A Villa Capra, de Andrea Palladio, é um centróide quase simétrico.

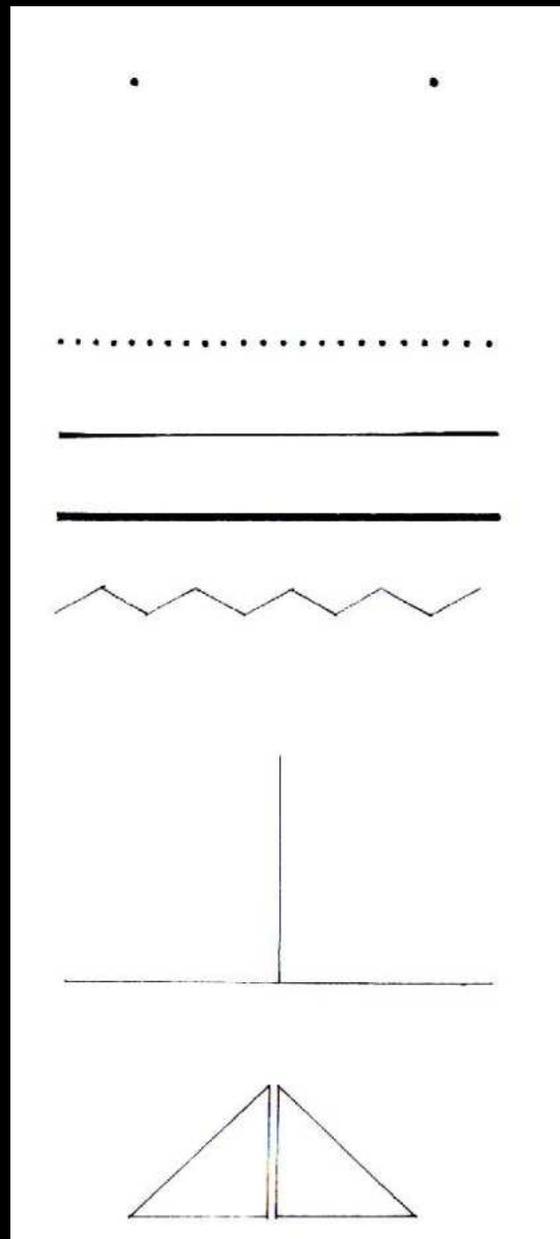


A Casa Robie, de Frank Lloyd Wright, desloca duas formas lineares em uma relação potencialmente de mudança.

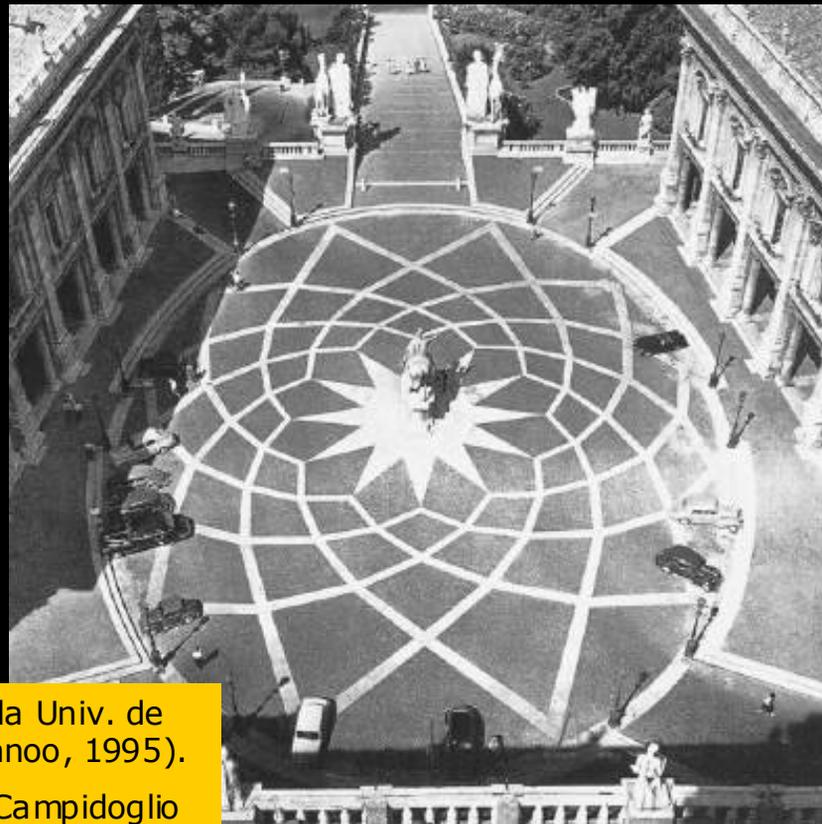


dinâmica da forma

- ponto
- pontos
- linha
 - espessura
 - direção
- horizontais / verticais
- diagonais



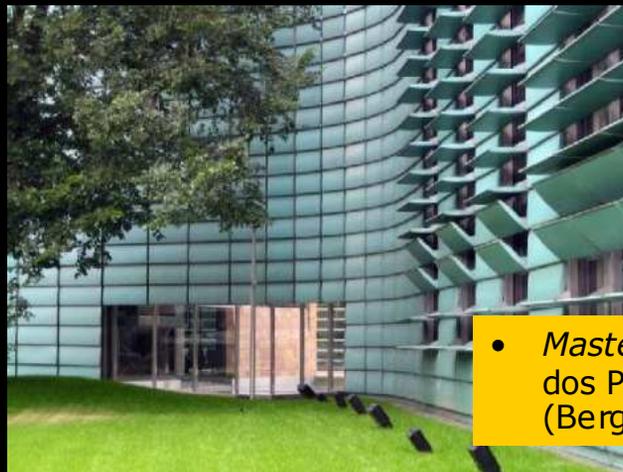
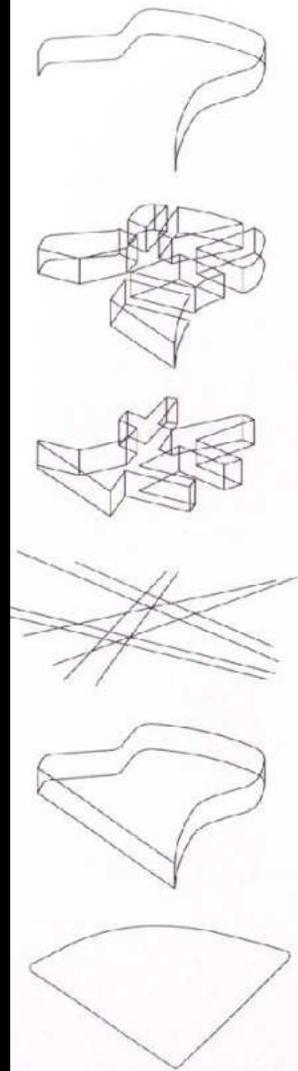
dinâmica da forma



- 1) Biblioteca da Univ. de Delft (Mecanoo, 1995).
- 2) Piazza del Campidoglio (Michelangelo, c. 1554).
- 3) Mesas de bar no Porto , Portugal.

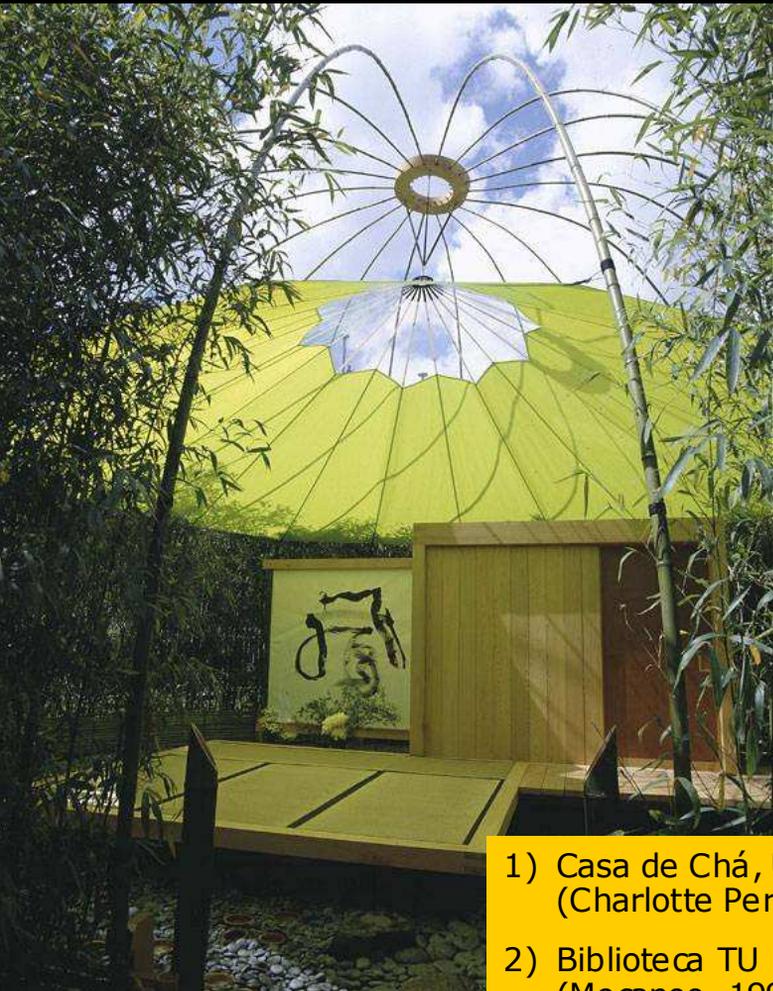


dinâmica da forma



- *Masterplan* das Embaixadas dos Países Nórdicos, Berlim (Berger + Parkkinen, 1999)

dinâmica da forma

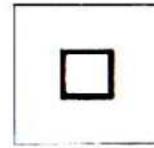


- 1) Casa de Chá, Unesco, Paris (Charlotte Perriand, 1993)
- 2) Biblioteca TU Delft (Mecanoo, 1995)
- 3) Parque Gráfico d'O Globo (Kenneth Sowerby, 1998)

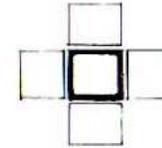
sistemas nucleares

■ sistemas

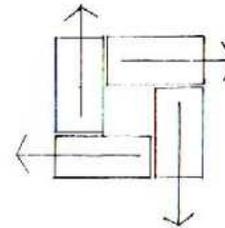
- disciplina dos arranjos
- organização geométrica
- idéia temática



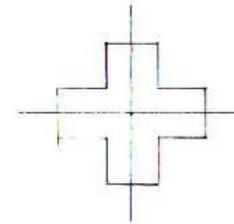
núcleo



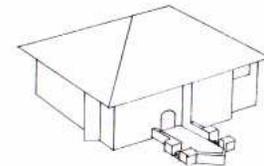
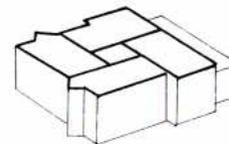
agrupamento



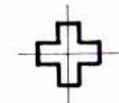
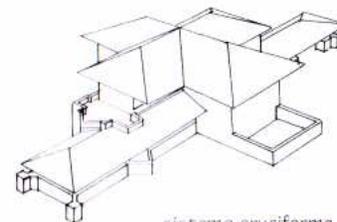
cata-vento



cruciforme



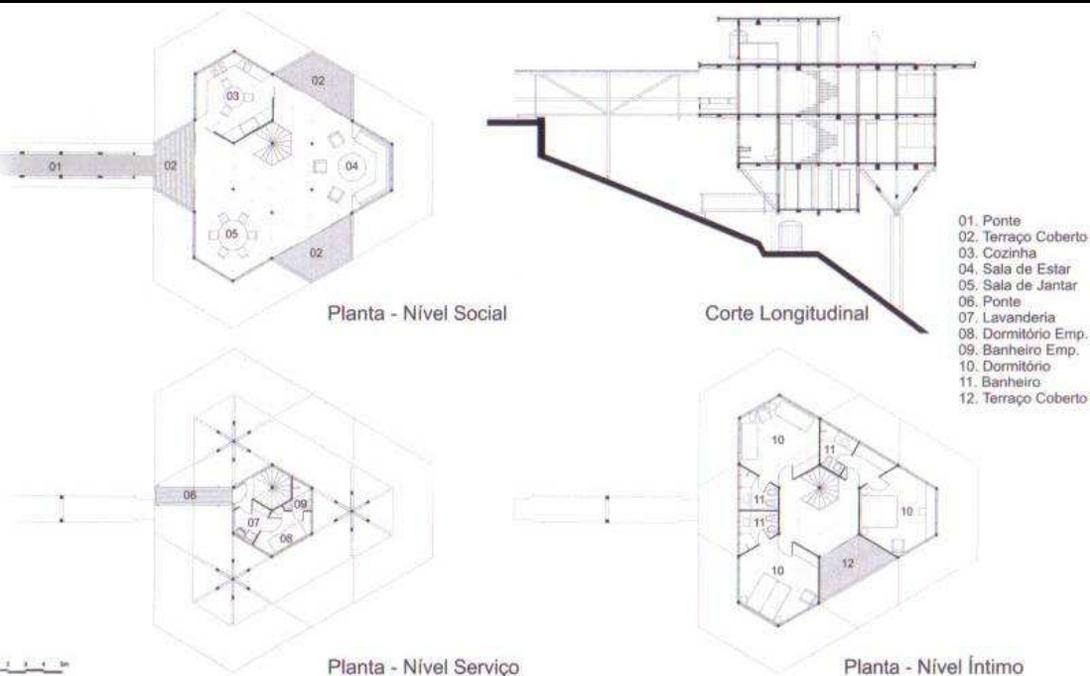
sistema de cata-vento, casa Arthur Heurtley: Frank Lloyd Wright



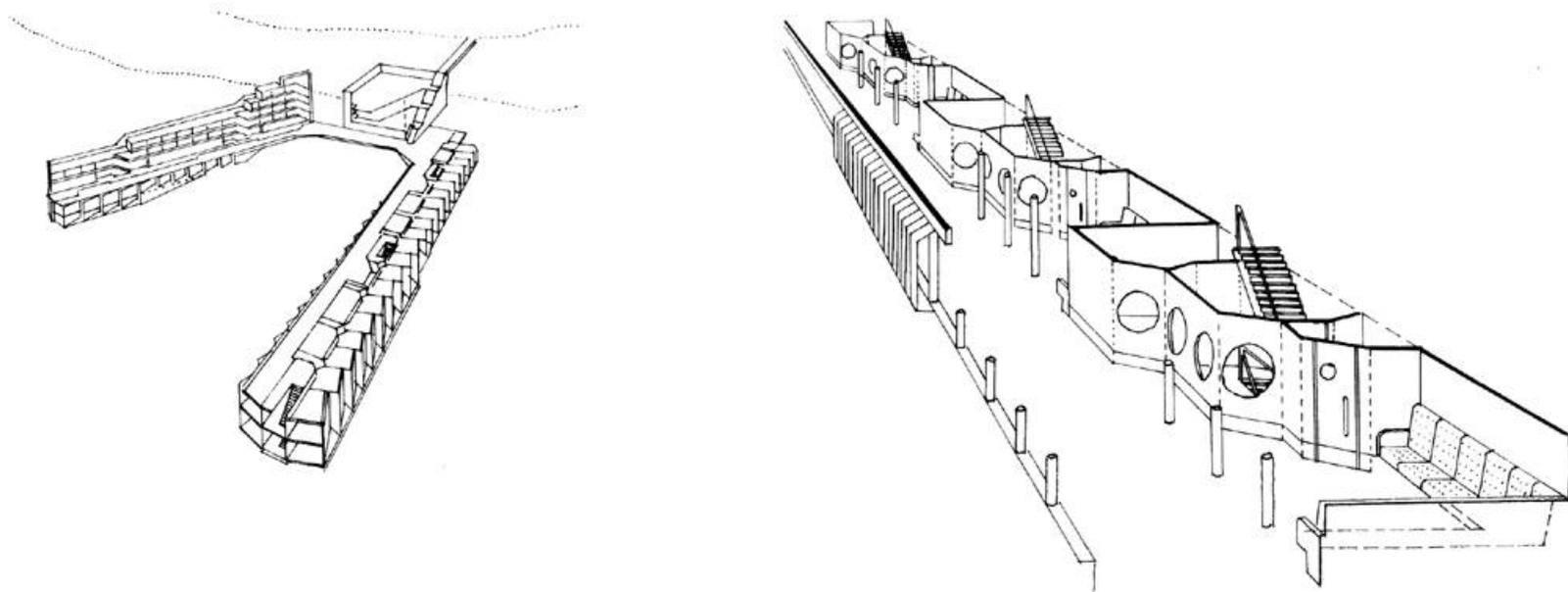
sistema cruciforme, casa Ward Willitts: Frank Lloyd Wright

sistemas nucleares

1) Casa Acayaba, Guarujá, SP (Marcos Acayaba, 1997)



sistemas lineares



James Stirling, anexo residencial da Universidade de St. Andrews, 1964

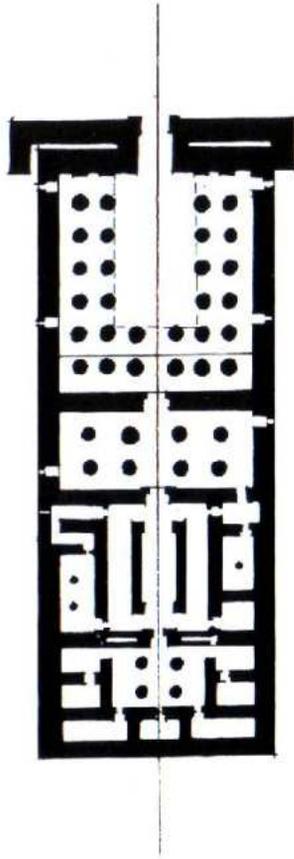
sistemas lineares



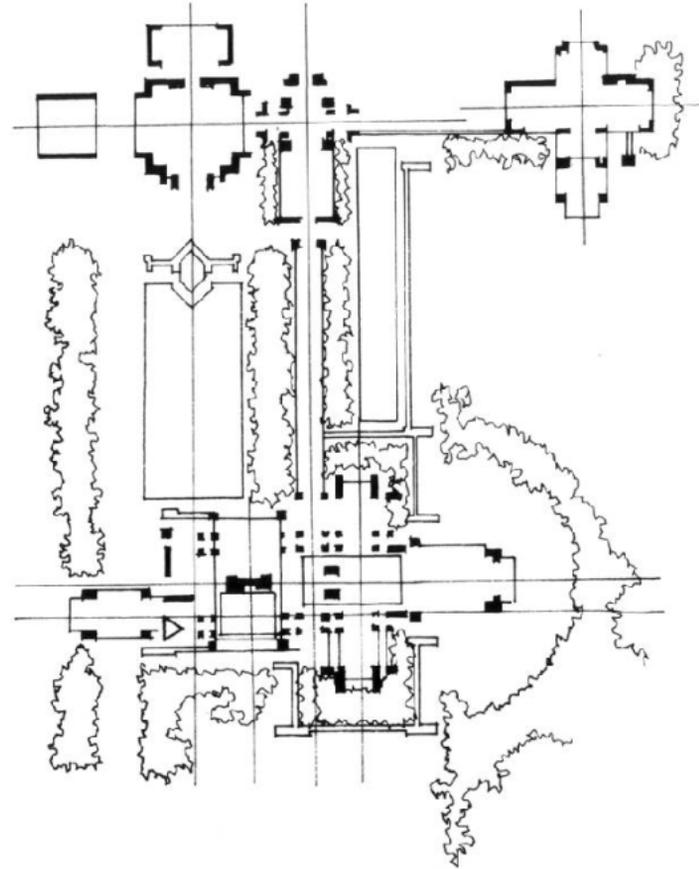
- 1) Conjunto Habitacional do Pedregulho (Reidy, 1952)
- 2) Parque Guinle (Lucio Costa, 1954)



sistemas axiais



Templo de Khons, Karnak, 1200 a.C.



Frank Lloyd Wright, Casa Darwin D. Martin, 1904

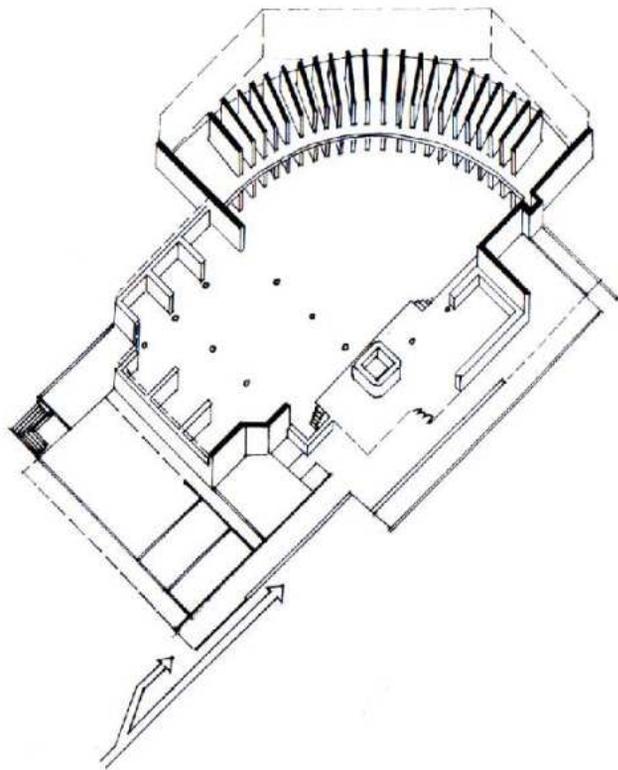
sistemas axiais



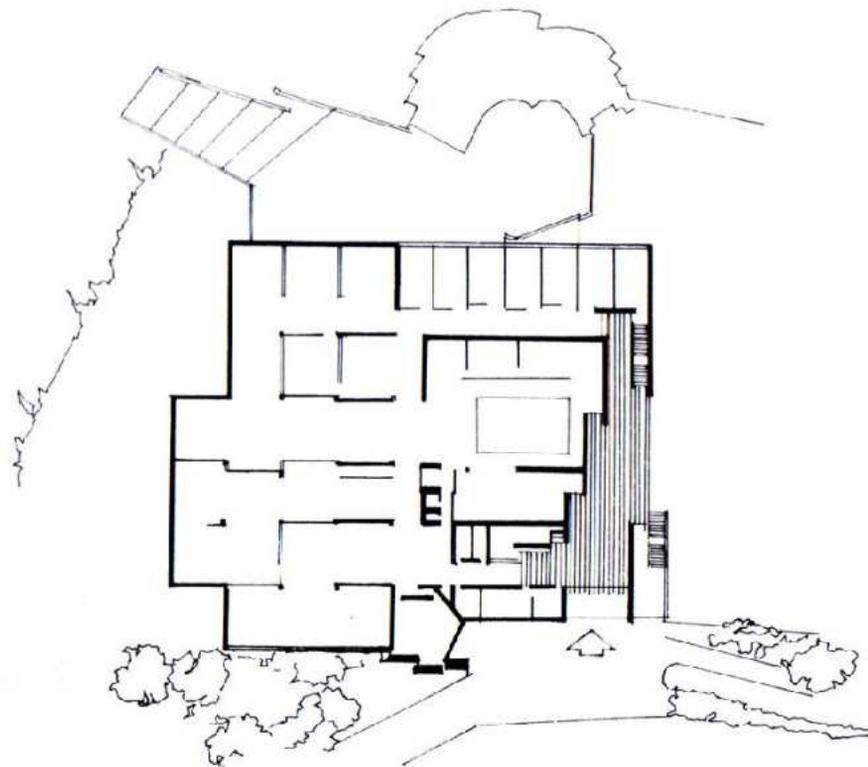
- 1) Basílica de São Pedro, Roma
- 2) Torre Einstein, Potsdam (Eric Mendesohn, 1924)
- 3) Plano Piloto, Brasília (Lucio Costa, 1960)
- 4) Jardins de Versalhes (André Le Nôtre, 1668)



sistemas escalonados e radiais

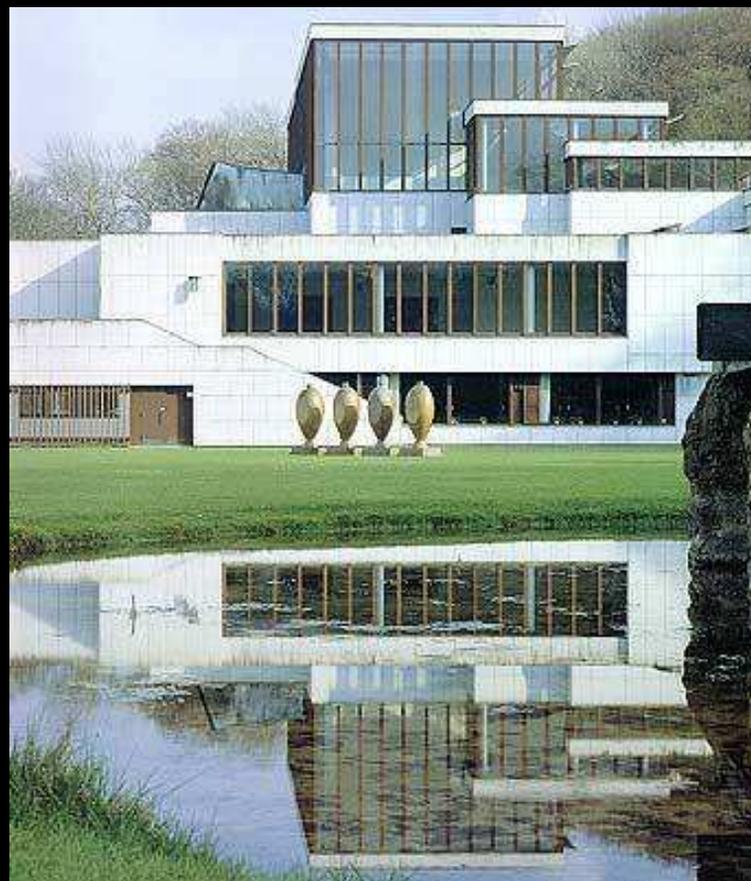


James Stirling, Faculdade de História
Universidade de Cambridge, 1964

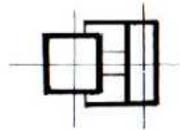
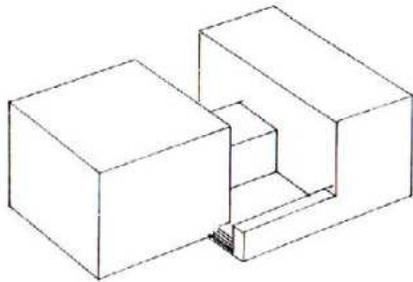


Alvar Aalto, Museu de Arte, Aalborg, 1969-70

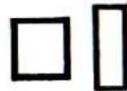
sistemas escalonados e radiais



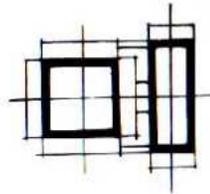
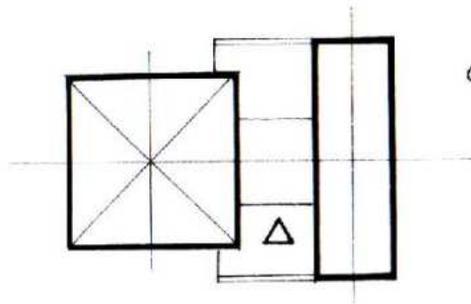
sistemas entrelaçados



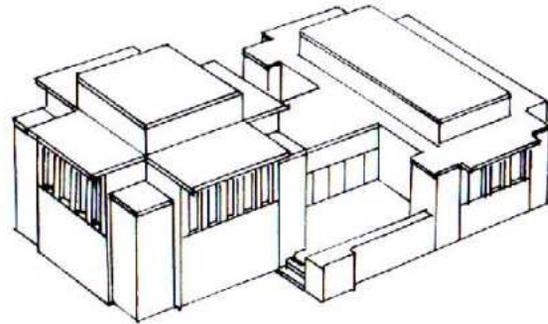
ENTRELAÇAMENTO



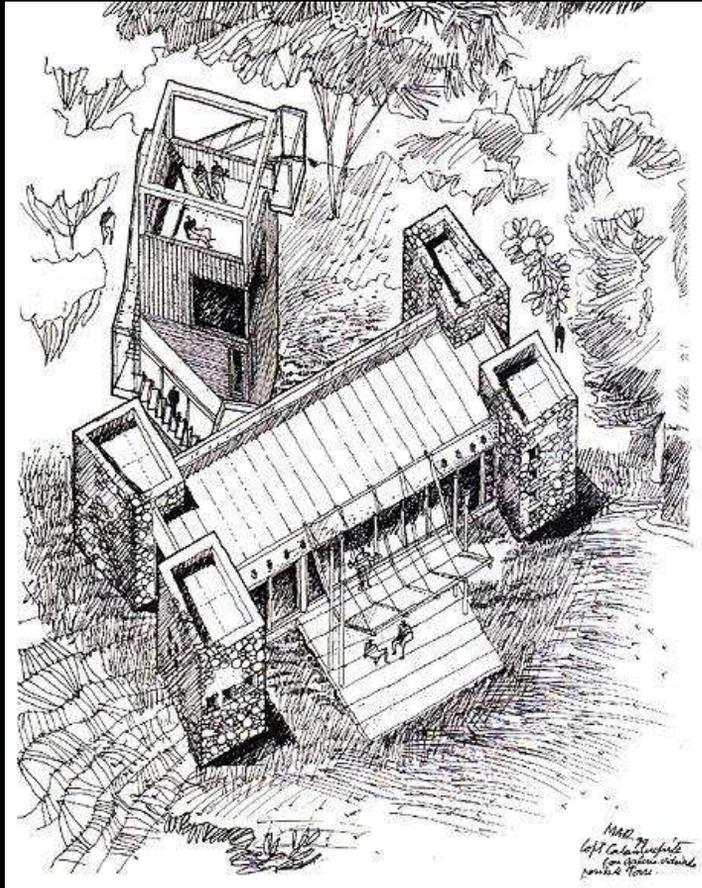
GENÉRICO



ESPECÍFICO

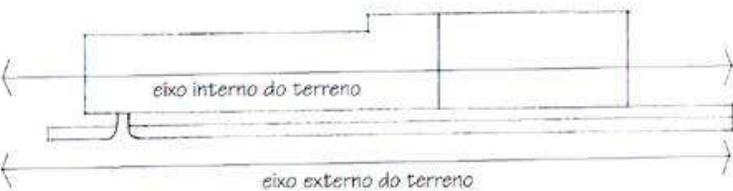


sistemas entrelaçados

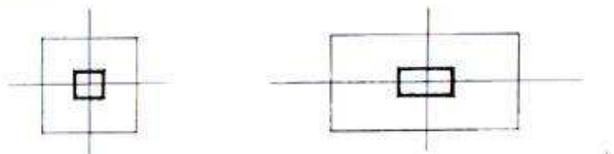


- 1) Casa em Calamuchita, Córdoba (Miguel Ángel Roca, 1997)
- 2) Habitat '67, Montreal (Moshe Safdie, 1967)

distorção da forma



TERRENO LINEAR



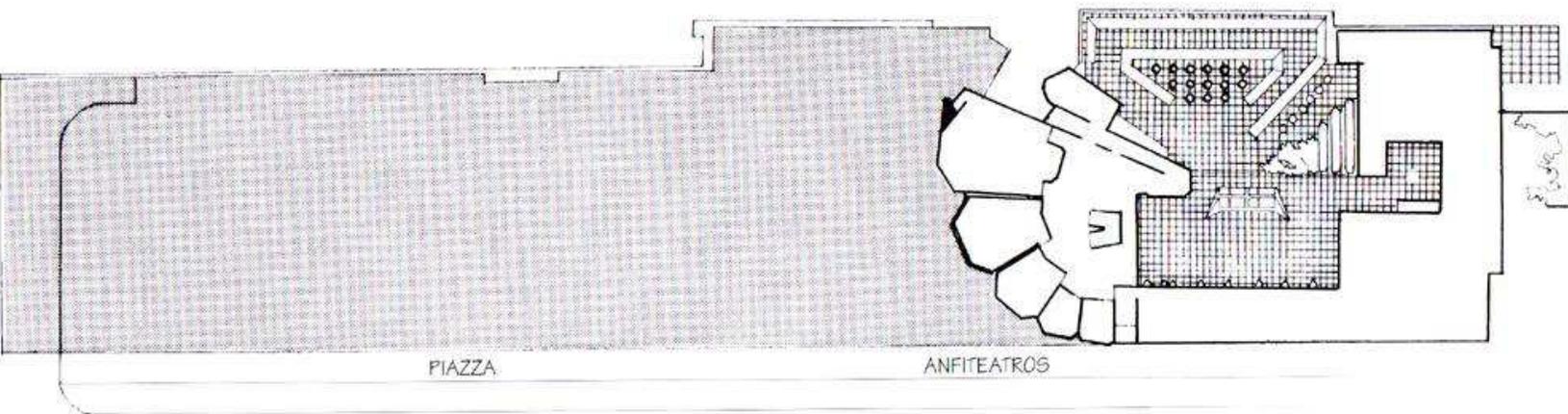
FORMA GENÉRICA

DISTORÇÃO

O Centro Cultural em Wolfsburg, de Alvar Aalto, trata de um problema centróide em um terreno linear. A forma nuclear genérica é distorcida pelo terreno para se tornar retilínea e, em termos específicos, a forma responde radialmente à piazza pelo arranjo dos anfiteatros.



FORMA ESPECÍFICA



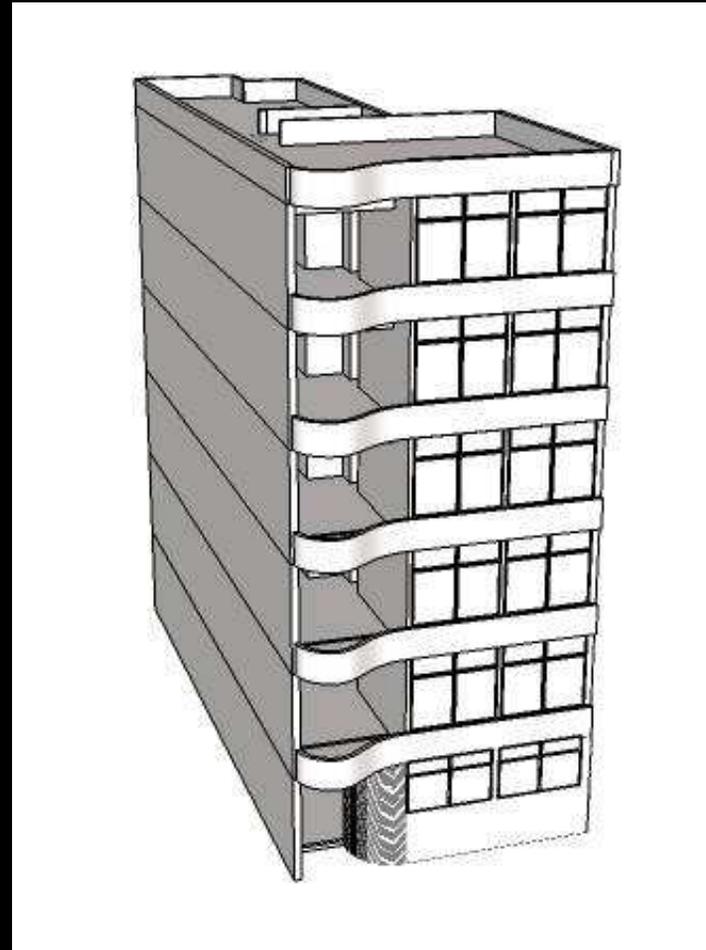
distorção da forma



outras análises comuns

- setorização
- fluxos
- ventilação
- insolação
- volumetria
- composição
- interior/exterior
- hierarquia
- aproximação

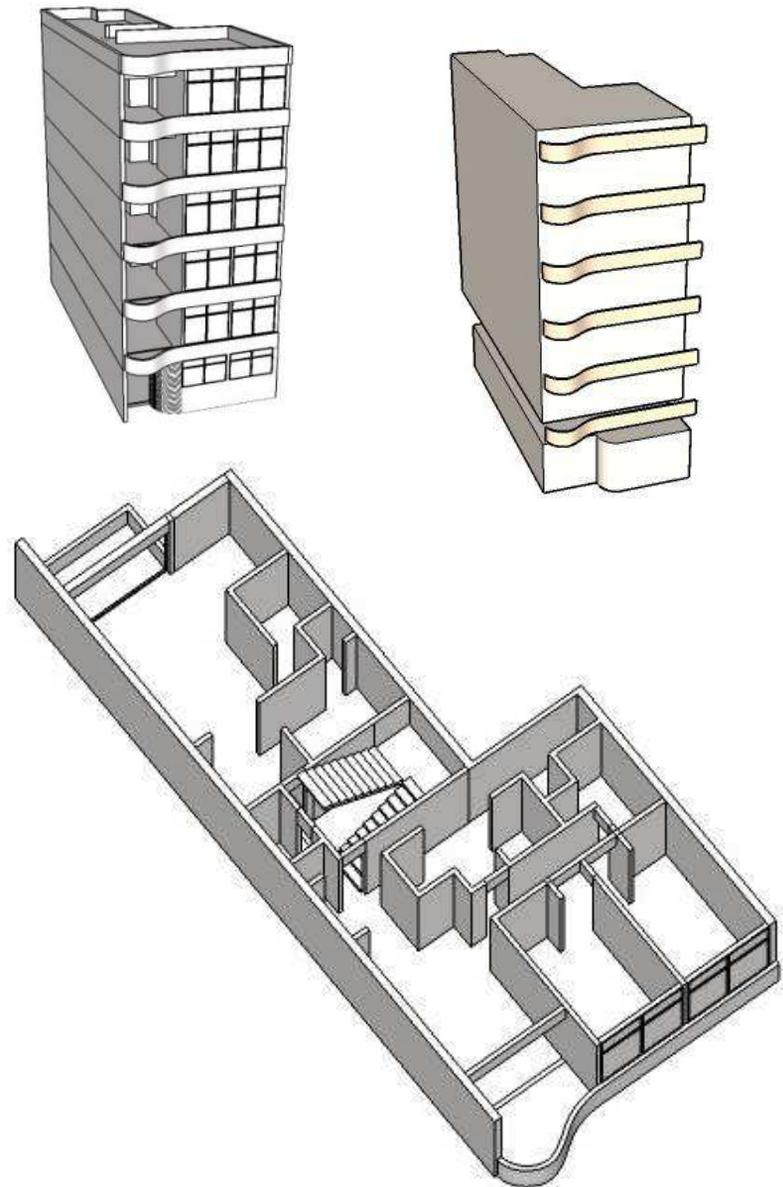
devem ser usadas de acordo com a obra



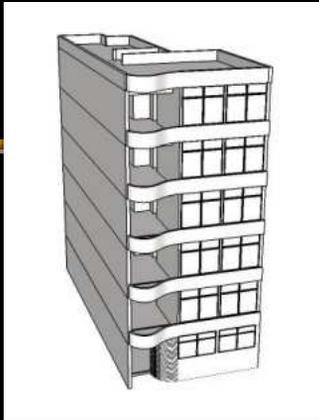
Edifício residencial, São Paulo (Gregori Warchavchick, 1939)

análises

- setorização
- fluxos
- ventilação
- insolação
- volumetria
- composição
- interior/exterior
- hierarquia
- aproximação
- outras

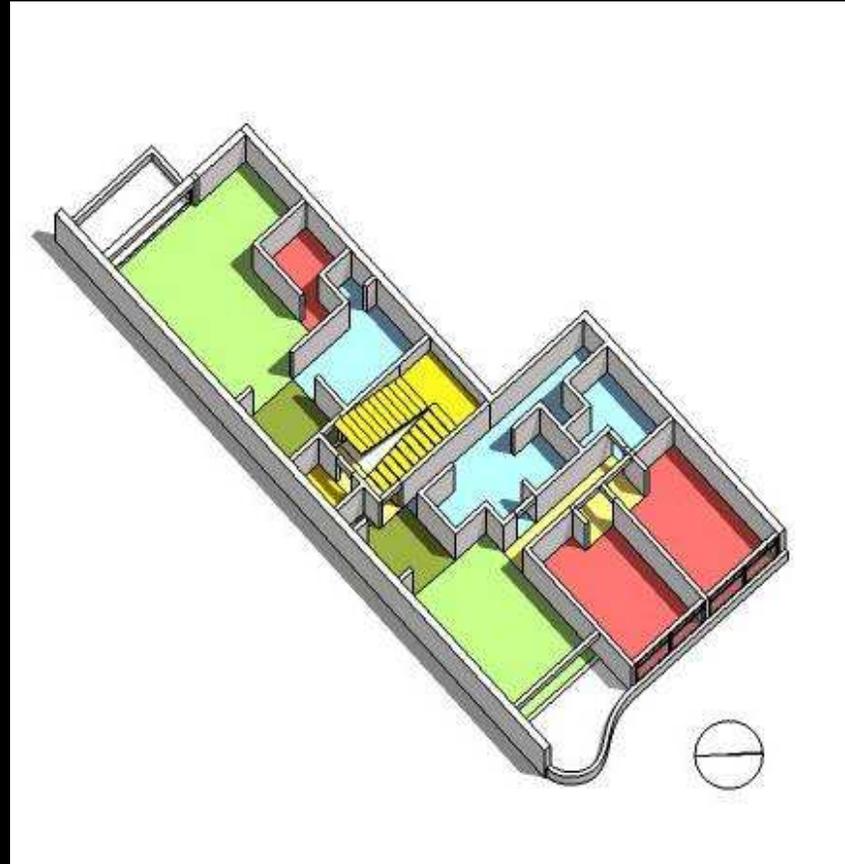


análises

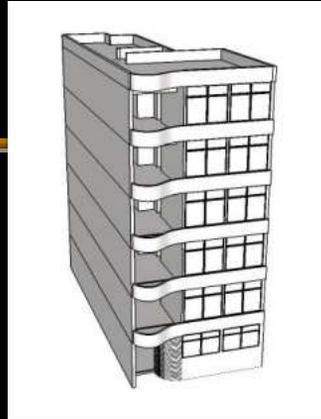


■ setorização

- íntimo
- social
- serviço

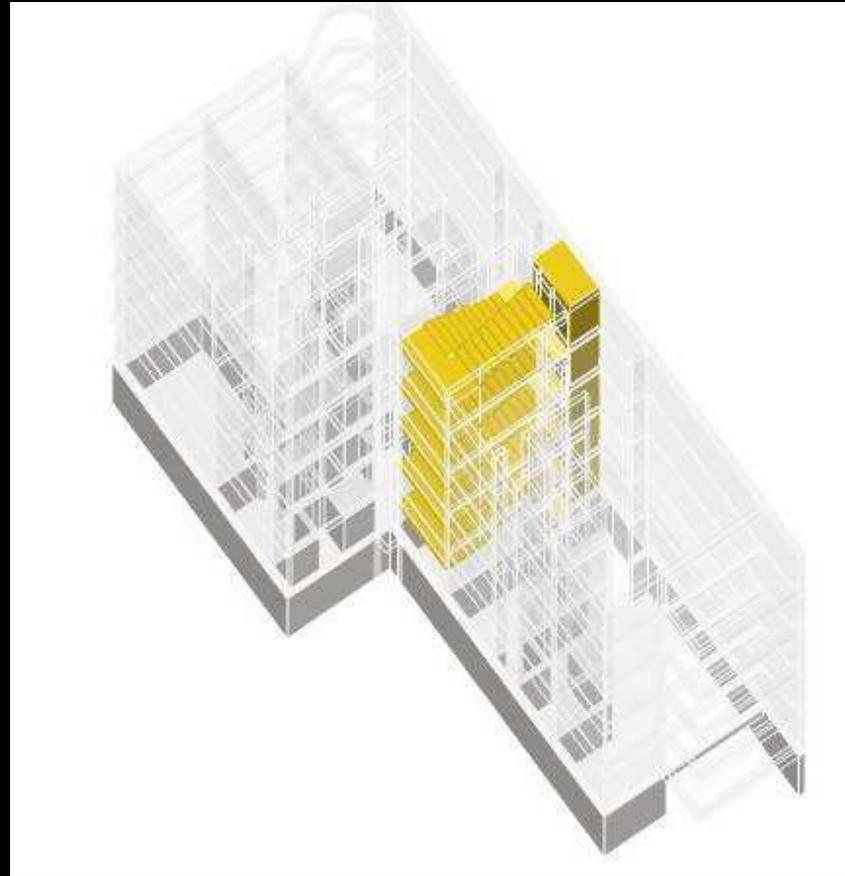


análises

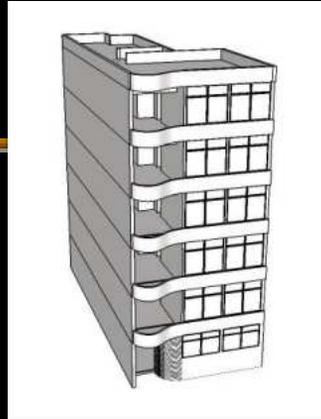


■ fluxos

- acesso interior/externor
- distribuição de fluxos
- barreiras

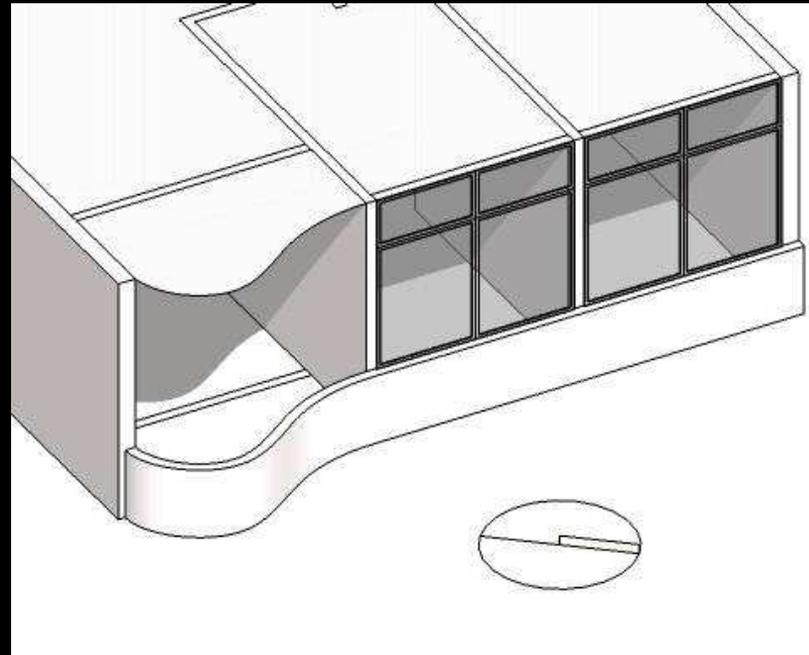


análises



■ ventilação / insolação

- caminhos principais
- barreiras
- áreas de sombra e de luz



Exemplo: Casa das Canoas

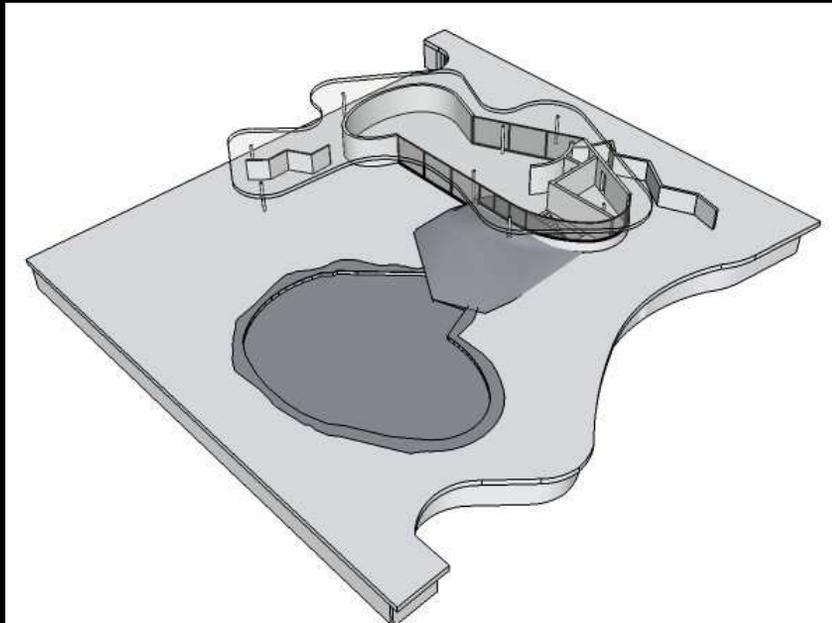
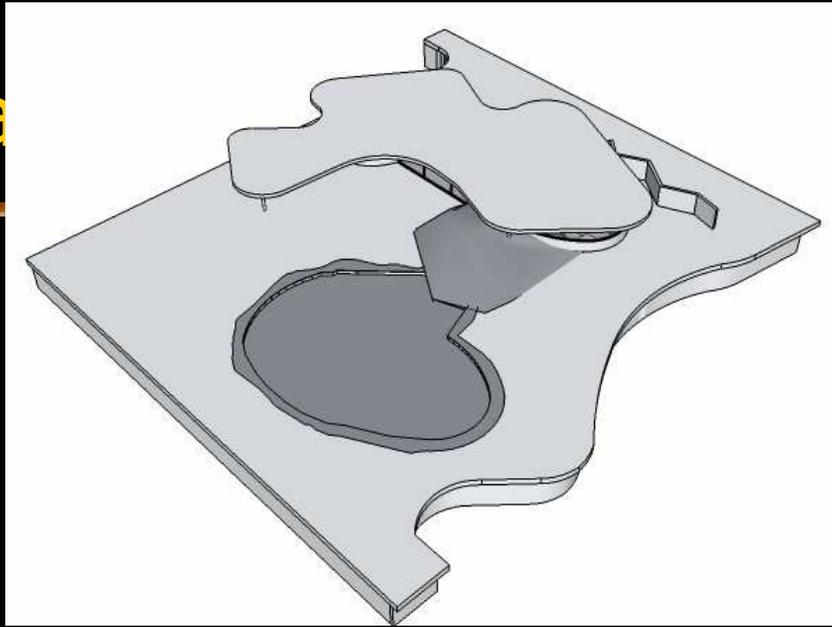
- Considerações iniciais
 - presença do verde
 - integração interior/exterior
 - formas curvas



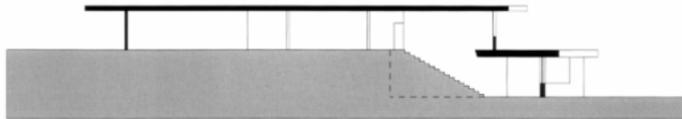
casa das canoas, rio de janeiro (oscar niemeyer, 1953)

considerações iniciais

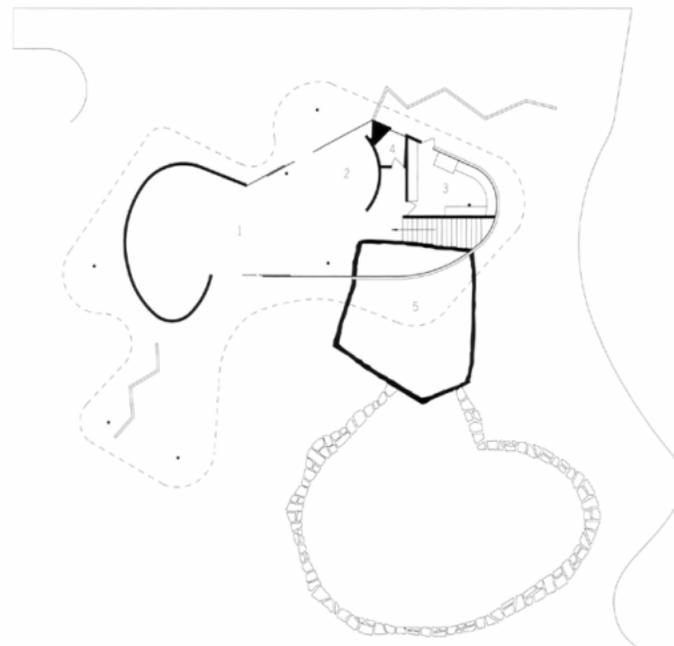
- presença do verde
- integração interior/exterior
- formas curvas



plantas e corte

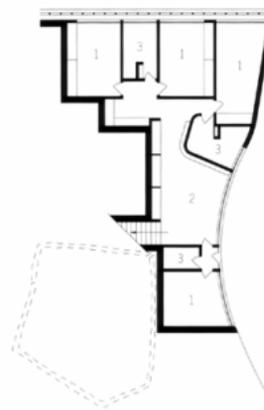


1 Corte



2 Planta do Pavimento Térreo

- 1 Sala de Estar
- 2 Sala de Jantar
- 3 Cozinha
- 4 Toilete
- 5 Rocha Natural

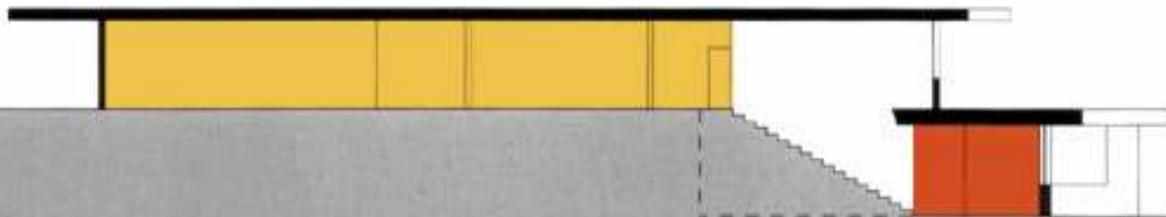
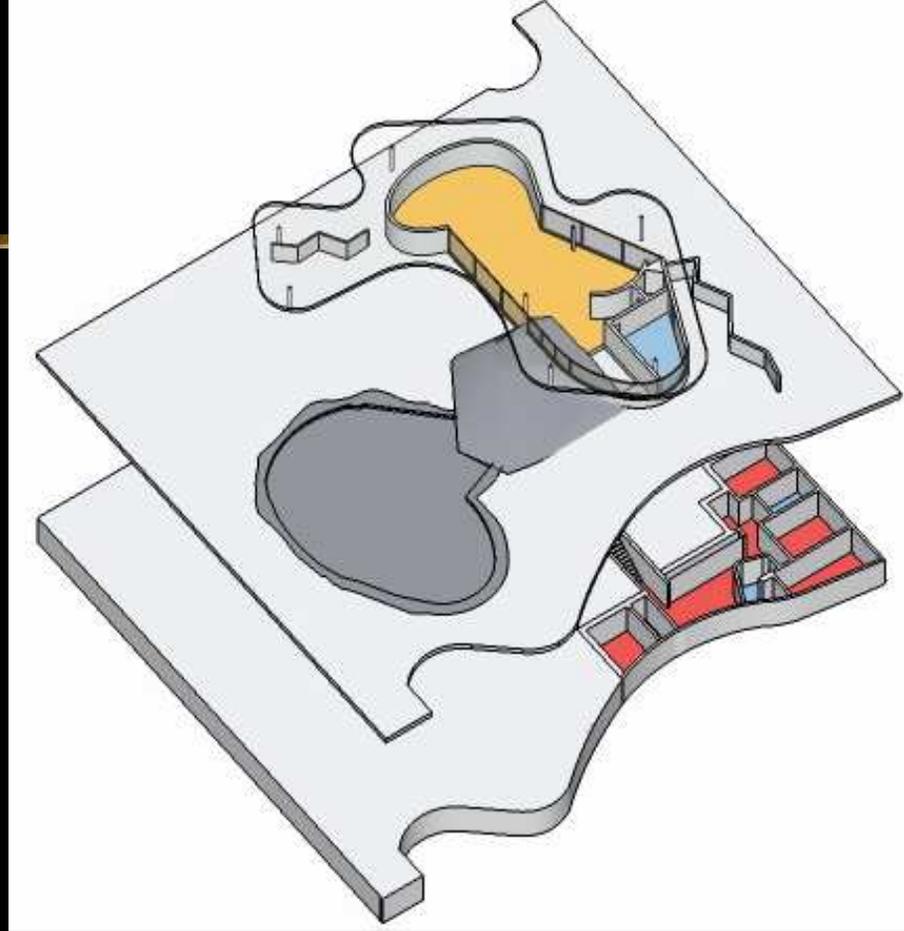


3 Planta do Pavimento Inferior

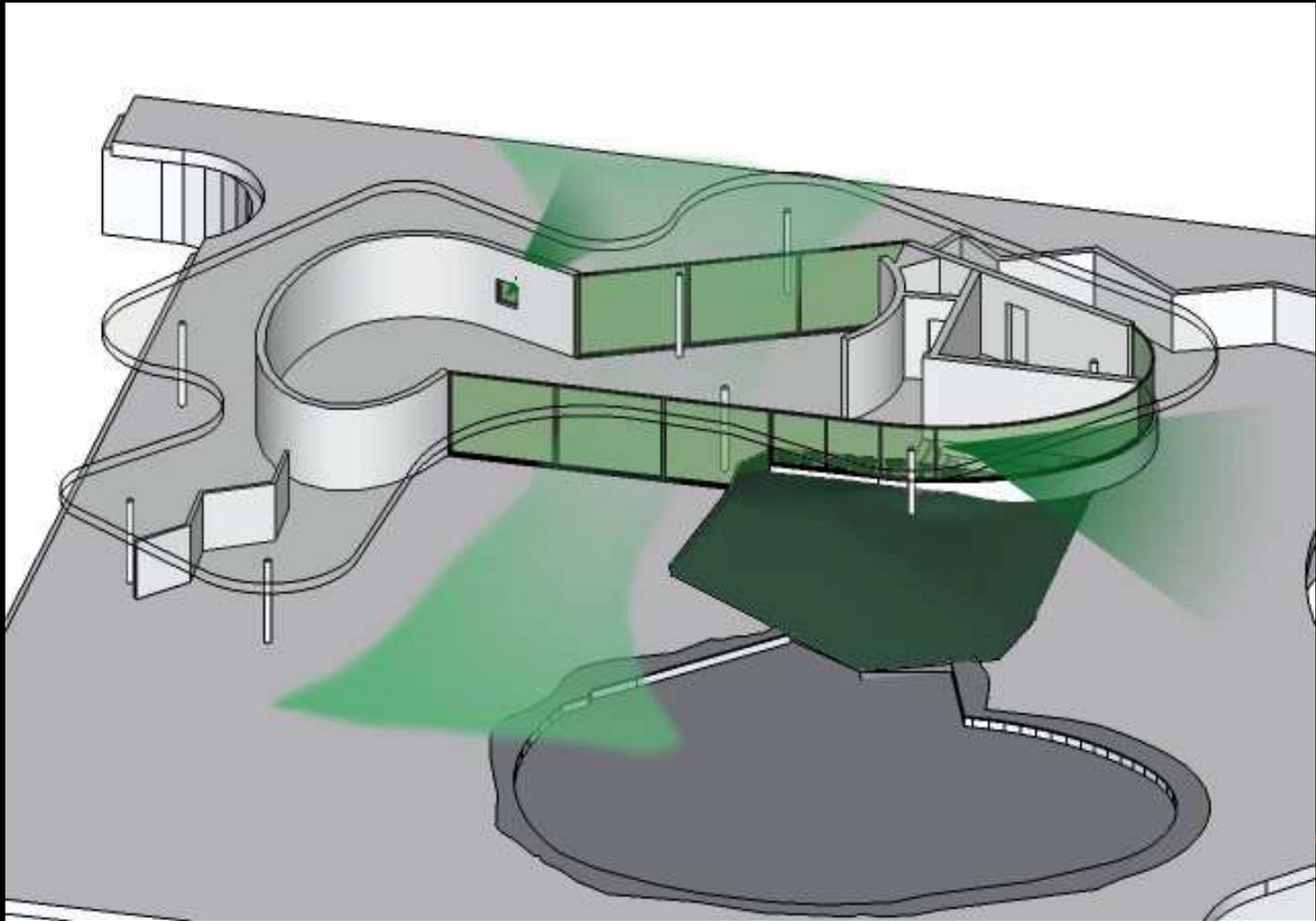
- 1 Quarto
- 2 Salieta
- 3 Banheiro

0 5 10 m

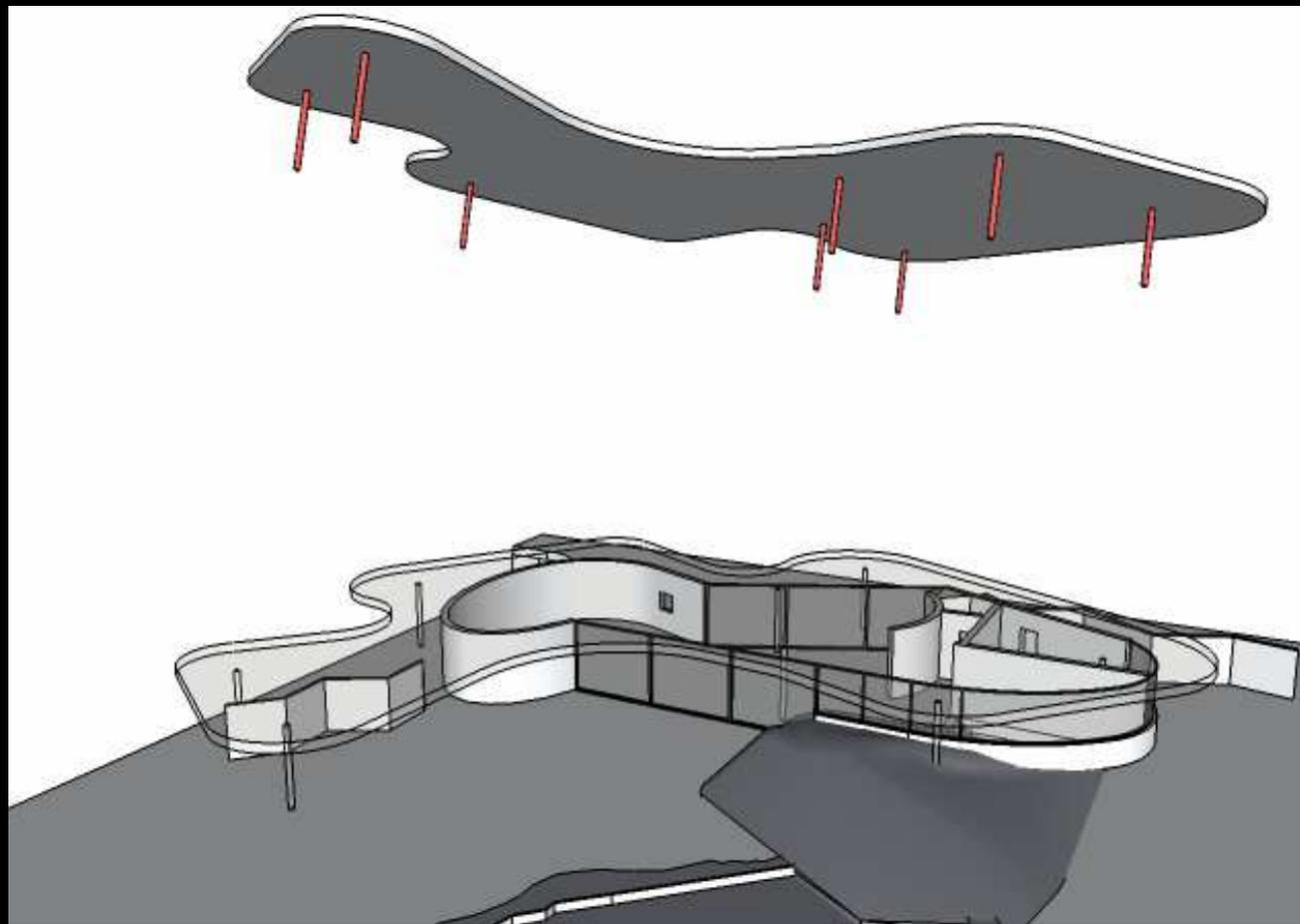
setorização



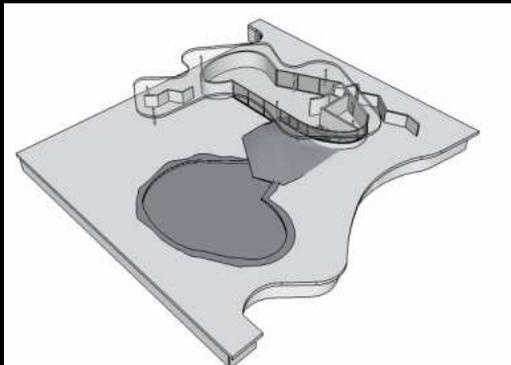
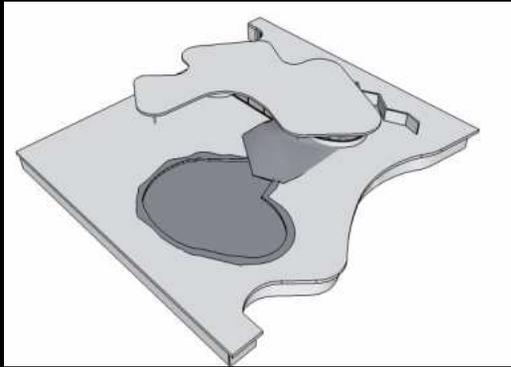
transparências / permeabilidade



estrutura

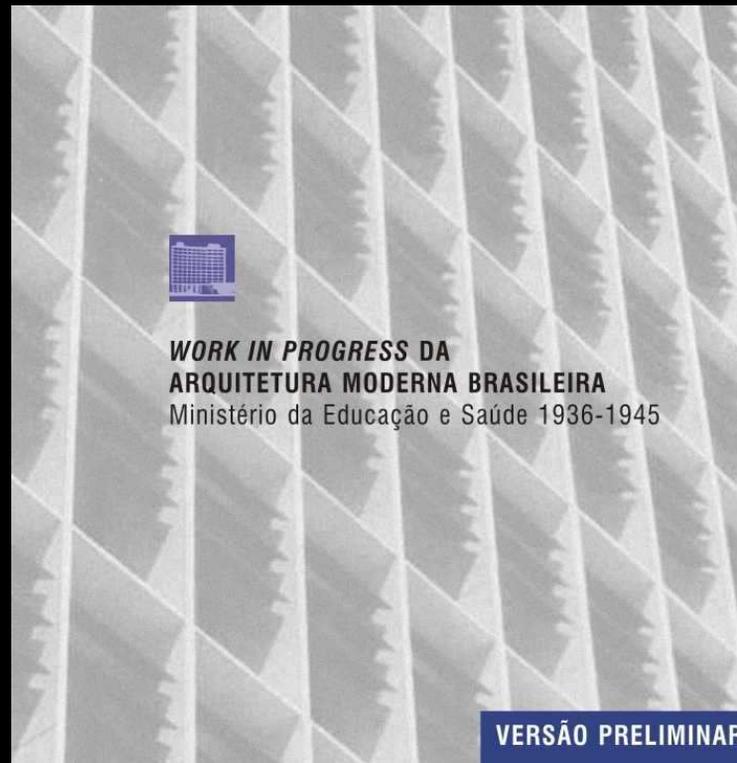


formas curvas



Ministério da Educação

- Projeto de Lucio Costa, Oscar Niemeyer, Carlos Leão, Jorge Moreira, Affonso Reidy, Ernani Vasconcelos, com consultoria de Le Corbusier e paisagismo de Burle Marx
- CD-ROM LAURD-PROURB
 - Prof. Roberto Segre

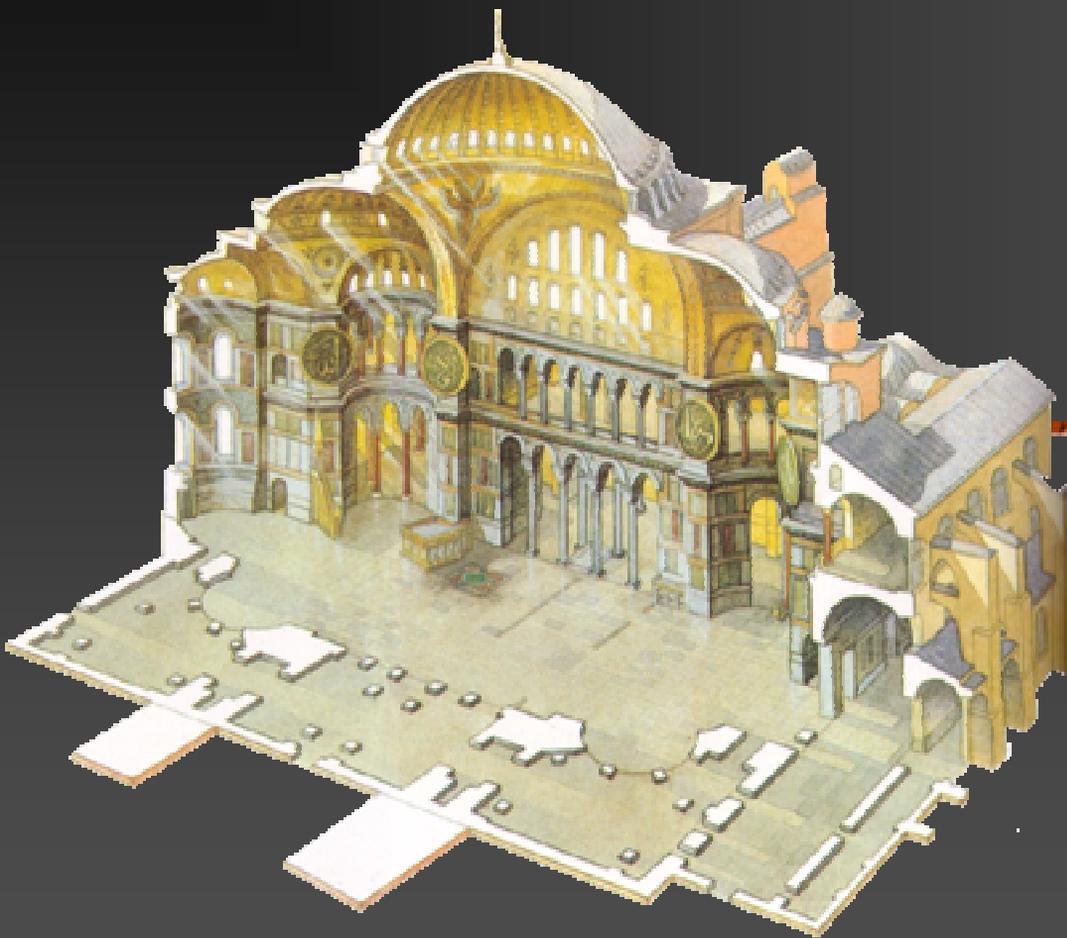


exercício de análise

- objetivo
 - pelo redesenho
 - perceber as relações formais, de escala e métricas
 - eventuais intuições sobre as estratégias de desenvolvimento do projeto
 - empregar análises arquitetônicas que conduzam a uma interpretação coerente da obra



GALLI, M.; MÜLHOF, C.
Virtual Terragni: CAAD in
historical and critical
research. Basel / Boston:
Birkhäuser, 2000.



fim