

PERENCANAAN TEKNOLOGI & SISTEM BANGUNAN (PTSB) 03

PERTEMUAN 2: FUNGSI & PERMASALAHAN

A building is an assemblage that is firmly attached to the ground and that provides total or nearly total shelter for machines, processing equipment, performance of human activities, storage of human possessions, or any combination of these.

Xudong Yang, 2003

OUTLINE

**BUILDING
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PERTEMUAN 2: FUNGSI & PERMASALAHAN

RESIDENTIAL ENVIRONMENT

the physical structure that man uses for shelter and the environs of that structure including all necessary services, facilities, equipment and devices needed or desired for the physical and mental health and social well-being of the family and individual

(WHO Expert Committee on the public health aspect in Xudong Yang, 2003, p. 1291)

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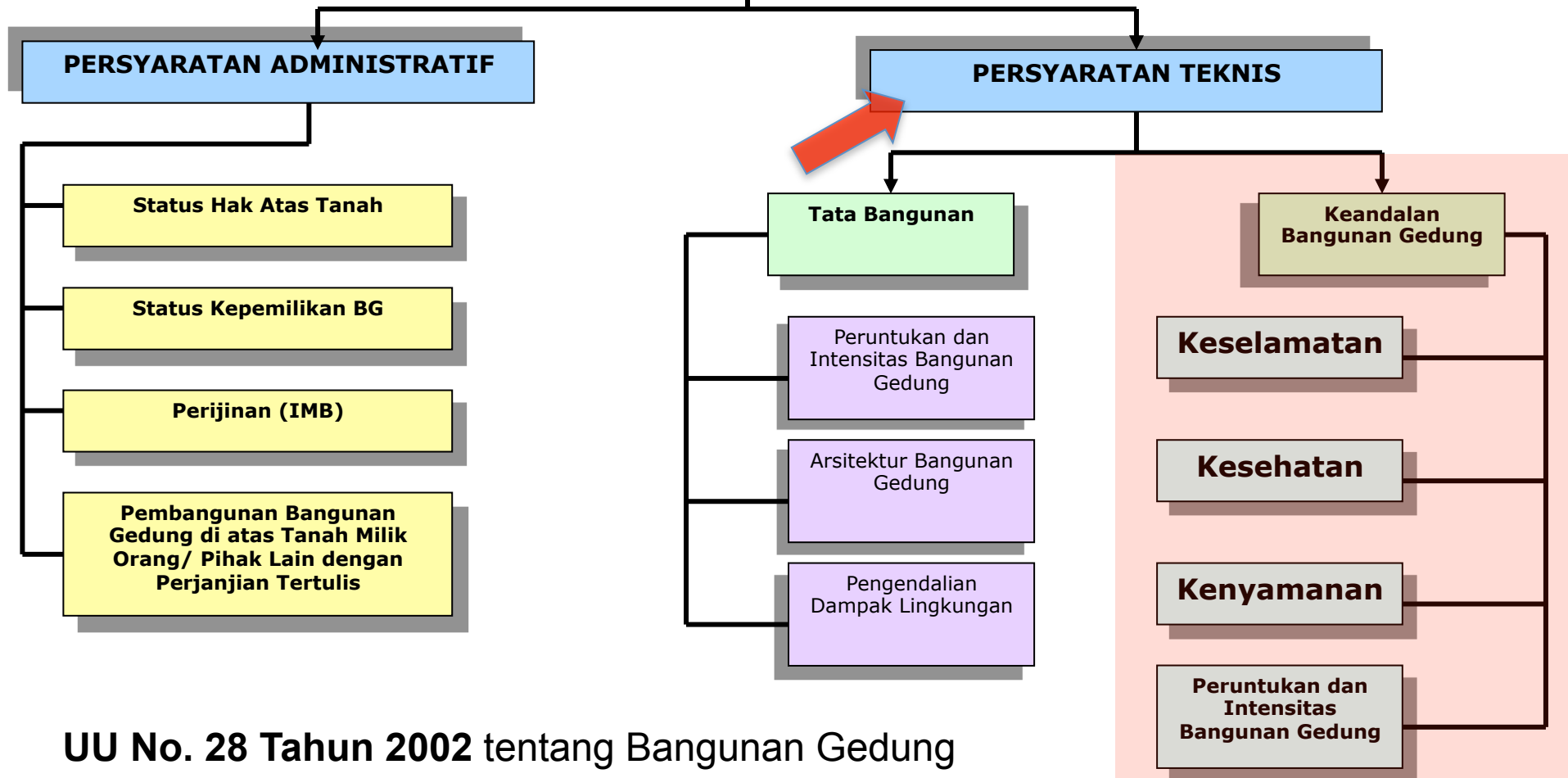
PERTEMUAN 2: FUNGSI & PERMASALAHAN

HUNIAN	KEAGAMAAN	USAHA	SOSIAL & BUDAYA	KHUSUS
<ul style="list-style-type: none">▪ Rumah tinggal tunggal▪ Rumah tinggal deret▪ Rumah susun▪ Rumah tinggal sementara	<ul style="list-style-type: none">▪ Masjid▪ Gereja▪ Pura▪ Vihara▪ Kelenteng	<ul style="list-style-type: none">▪ Perkantoran▪ Perdagangan▪ Perindustrian▪ Perhotelan▪ Tempat wisata dan rekreasi▪ Terminal, dan▪ Penyimpanan.	<ul style="list-style-type: none">▪ Pendidikan,▪ Kebudayaan,▪ Pelayanan kesehatan,▪ Laboratorium, dan▪ Pelayanan umum	<ul style="list-style-type: none">▪ reaktor nuklir▪ instalasi pertahanan dan keamanan, dan▪ bangunan sejenis yang diputuskan oleh menteri

Satu bangunan gedung dapat memiliki lebih dari satu fungsi

PERTEMUAN 2: FUNGSI & PERMASALAHAN

PERSYARATAN BANGUNAN GEDUNG



UU No. 28 Tahun 2002 tentang Bangunan Gedung

DRA family house,
a steel construction suspended by *querkraft* architect



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PERTEMUAN 2: FUNGSI & PERMASALAHAN

A. Human Factors

1. Maintenance of a thermal environment that will avoid undue but permit adequate heat loss from the human body.
2. Indoor air of acceptable quality.
3. Daylight, sunlight, and artificial illumination.
4. In family units, facilities for sanitary storage, refrigeration, preparation, and service of nutritional and satisfactory foods and meals.
5. Adequate space, privacy, and facilities for the individual and arrangement and separation for normal family living.

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A. Human Factors

6. Protection from noise from without, other units, and certain other rooms and control of reverberation noises within housing structures.
7. Design, materials, and equipment that facilitate performance of household tasks and functions without undue physical and mental fatigue.
8. Design, facilities, surroundings, and maintenance to produce a sense of mental wellbeing.
9. Control of health aspects of materials.

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B. Sanitation and Maintenance

1. Design, materials, and equipment to facilitate clean, orderly, and sanitary maintenance of the dwelling and personal hygiene of the occupants.
2. Water piping of approved, safe materials with installed and supplied fixtures that avoid introducing contamination.
3. Adequate private sanitary toilet facilities within family units.
4. Plumbing and drainage system designed, installed, and maintained to protect against leakage, stoppage, or overflow and escape of odors.

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B. Sanitation and Maintenance

5. Design and arrangement to properly drain roofs, yards, and premises and conduct such drainage from the buildings and premises.
6. Design and maintenance to exclude and facilitate control of rodents and insects.
7. Facilities for the suitable storage of belongings.

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Sanitasi



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Utilitas



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C. Safety and Injury Protection

1. Construction, design, and materials of a quality necessary to withstand all anticipated forces that affect structural stability.
2. Construction, installation materials, arrangement, facilities, and maintenance to minimize danger of explosions and fires or their spread.
3. Design, arrangement, and maintenance to facilitate ready escape in case of fire or other emergency.
4. Protection against all electrical hazards, including shocks and burns.

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C. Safety and Injury Protection

6. Design, maintenance, and arrangement of facilities, including lighting, to minimize hazards of falls, slipping, and tripping.
7. Facilities and arrangements to promote security of the person and belongings.

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Struktur



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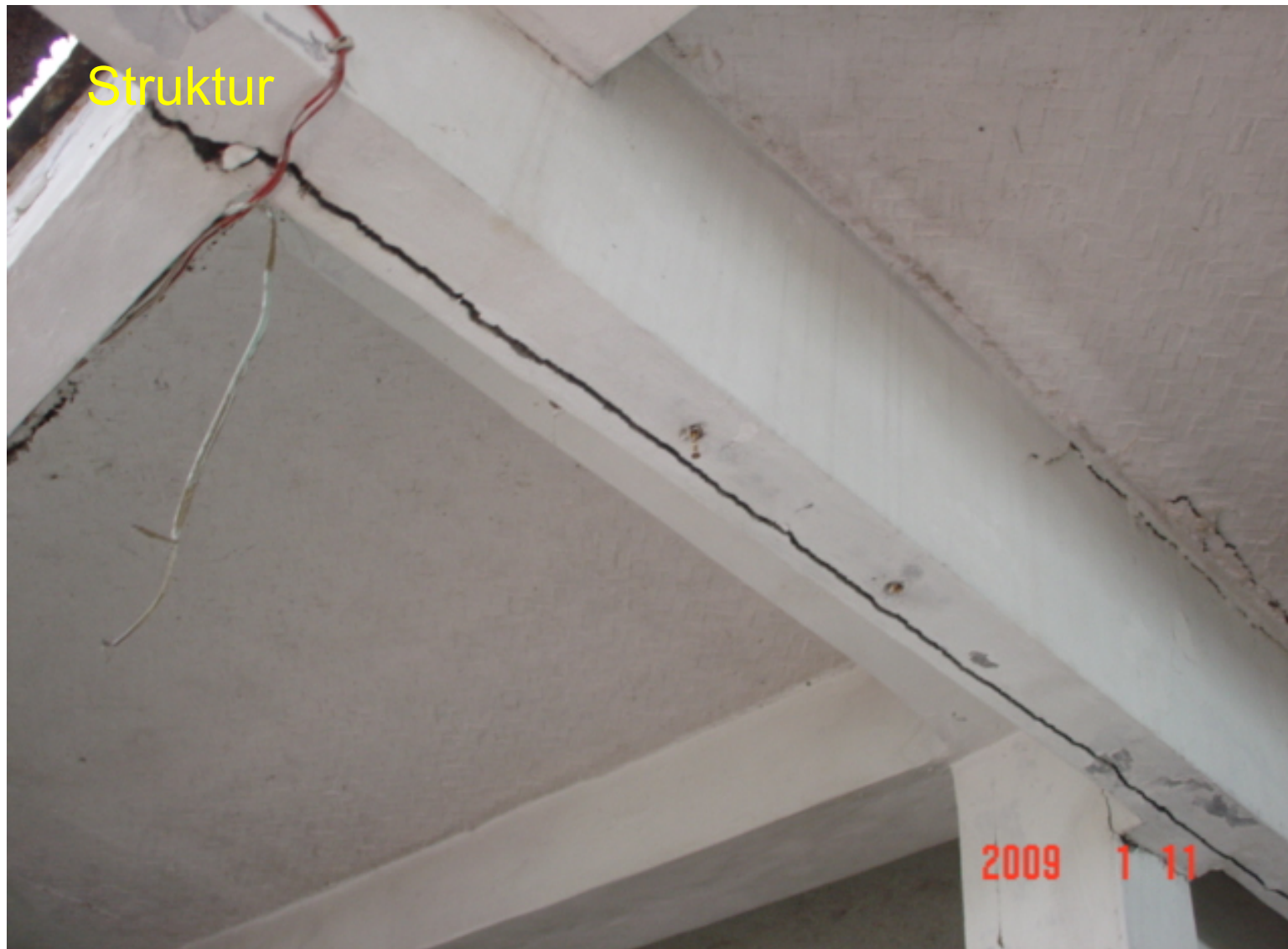
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Struktur

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Aksesibilitas



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Aksesibilitas



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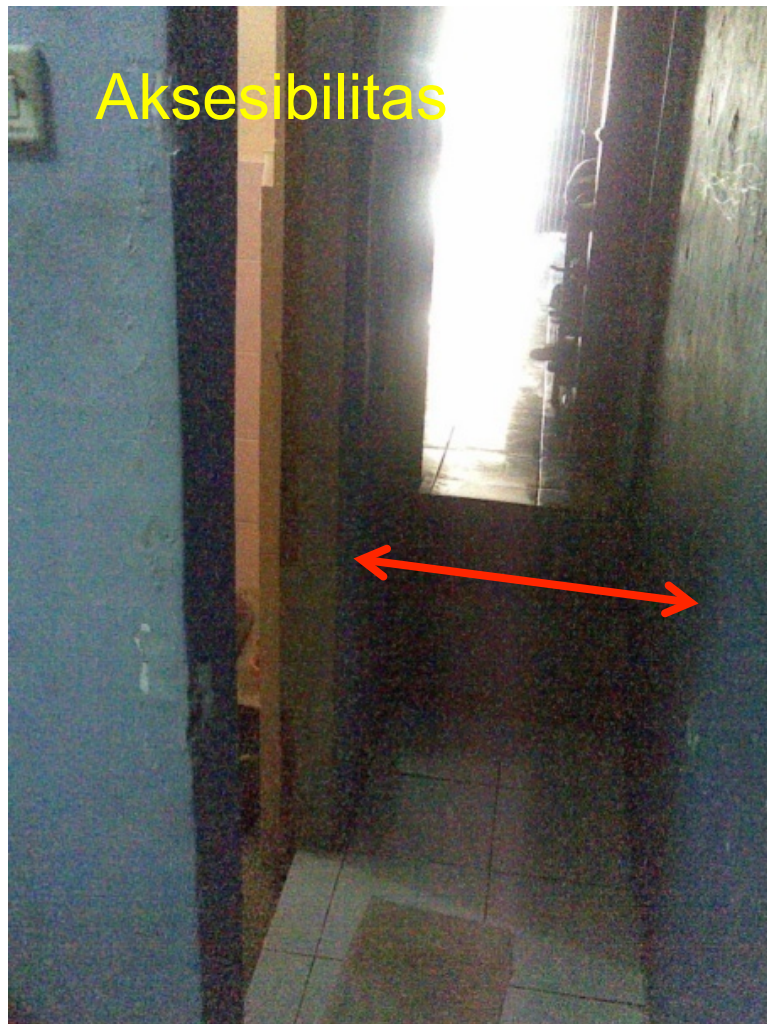
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Aksesibilitas



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Iklm



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Kenyamanan



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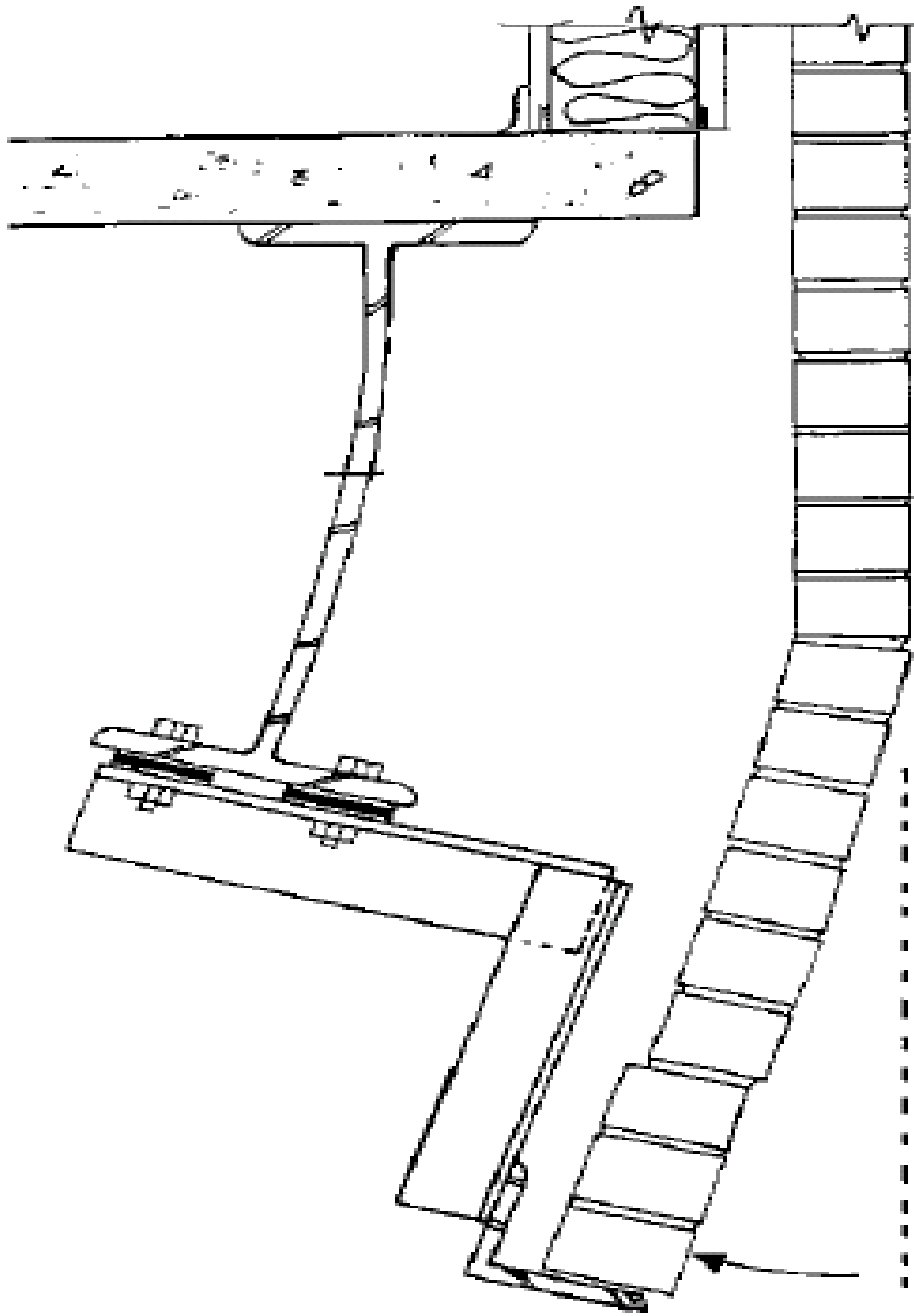
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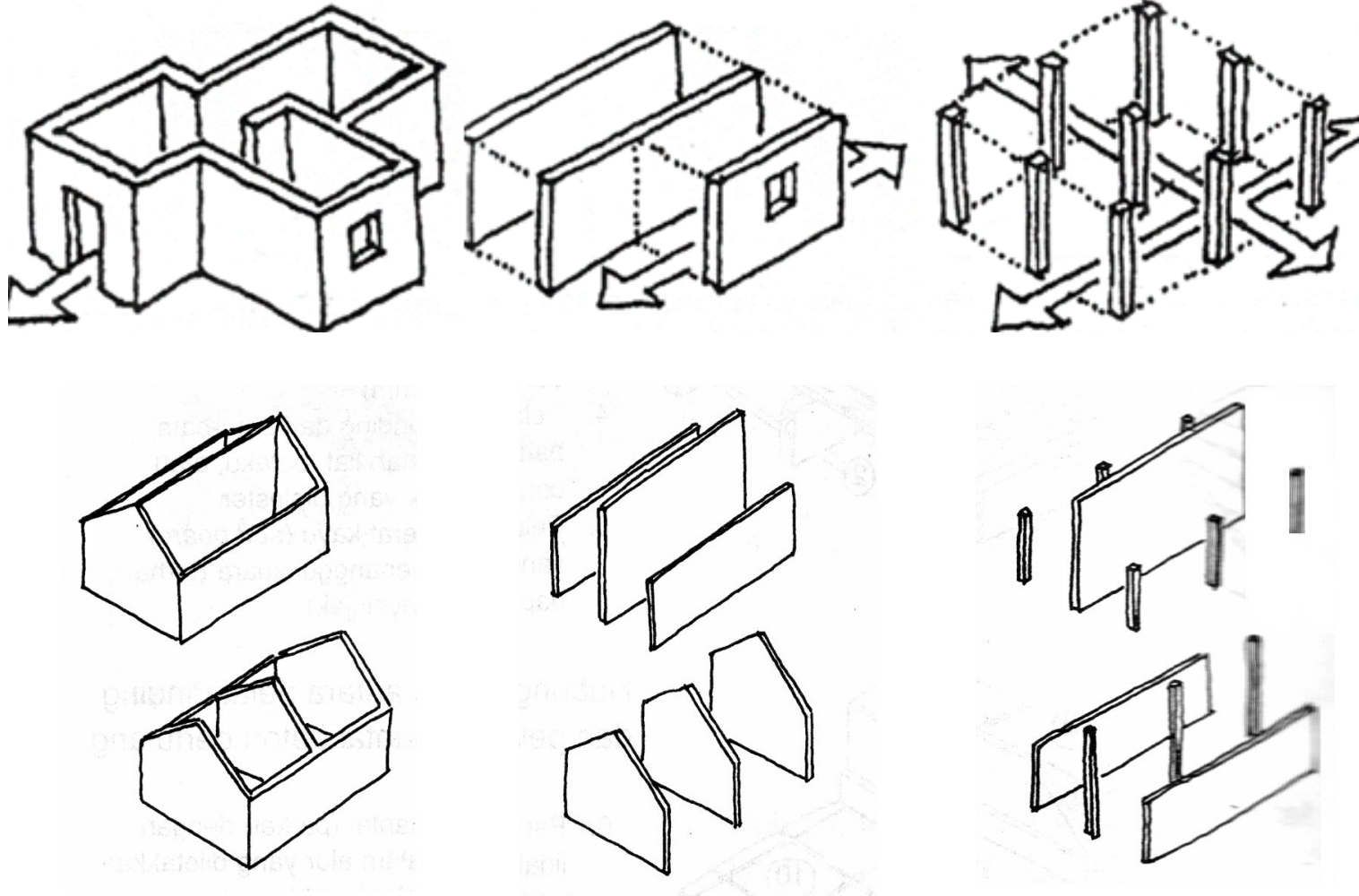
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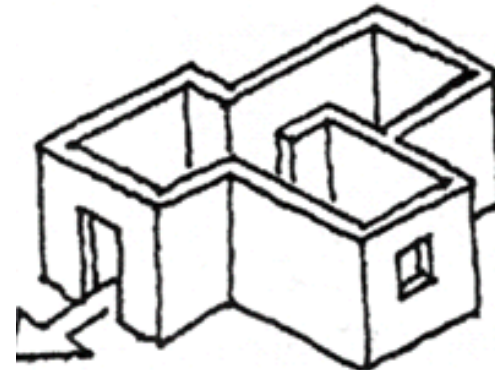
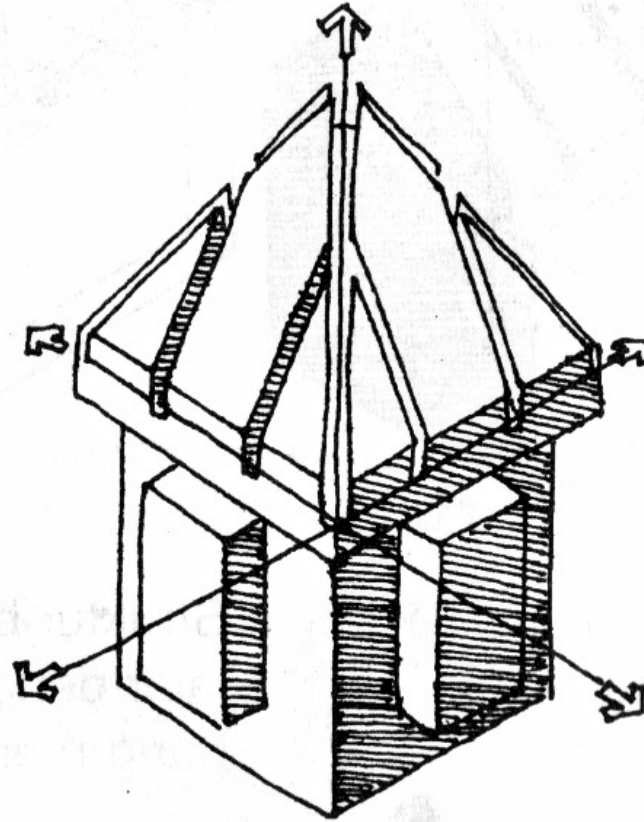
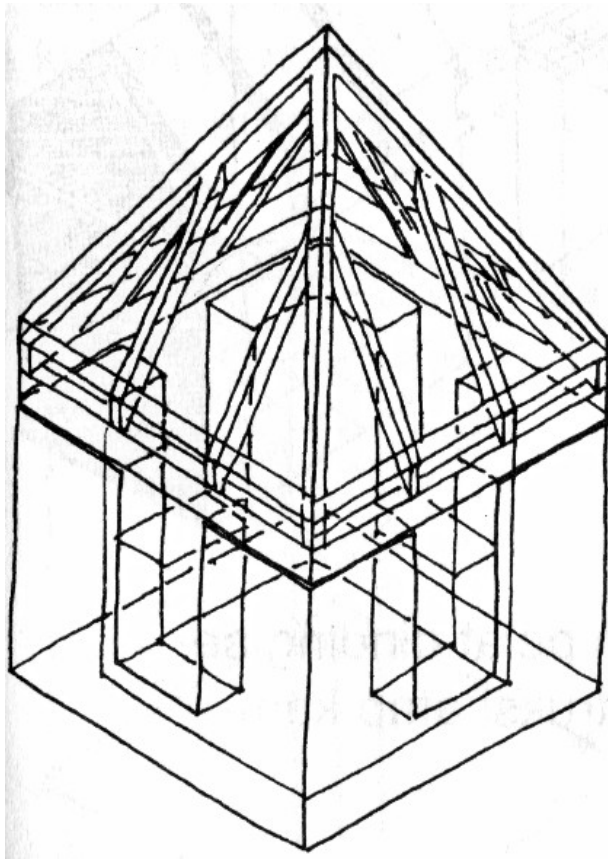
SEISMIC RESISTANT BUILDING

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Reference: Frick, H., Purwanto, LMF, *Sistem bentuk struktur bangunan*, Yogyakarta, Kanisius, 1998



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PERTEMUAN 2: SISTEM STRUKTURAL



House in Torrelles, Spain – Rob Dubois

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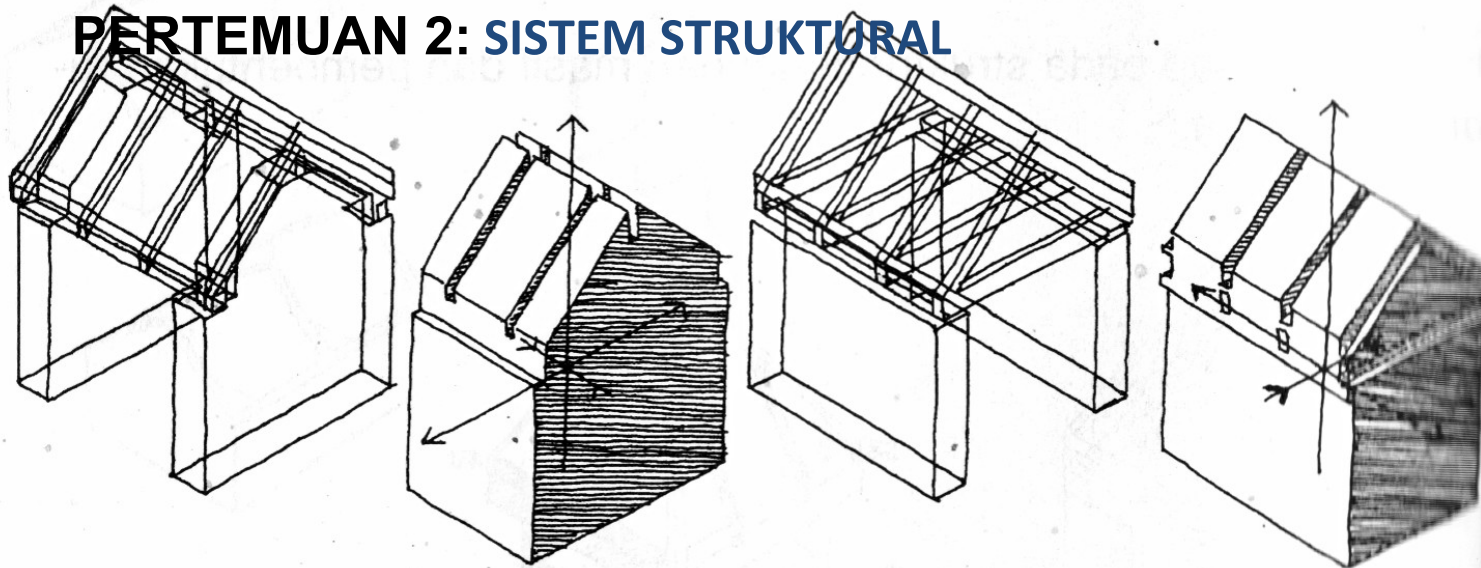
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Phenomenon

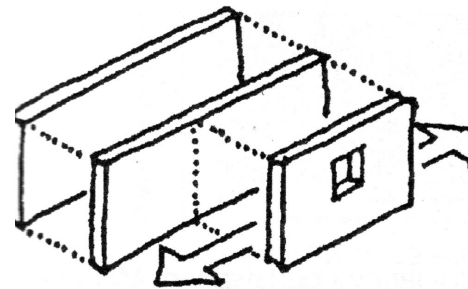
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PERTEMUAN 2: SISTEM STRUKTURAL



Pararel Walls



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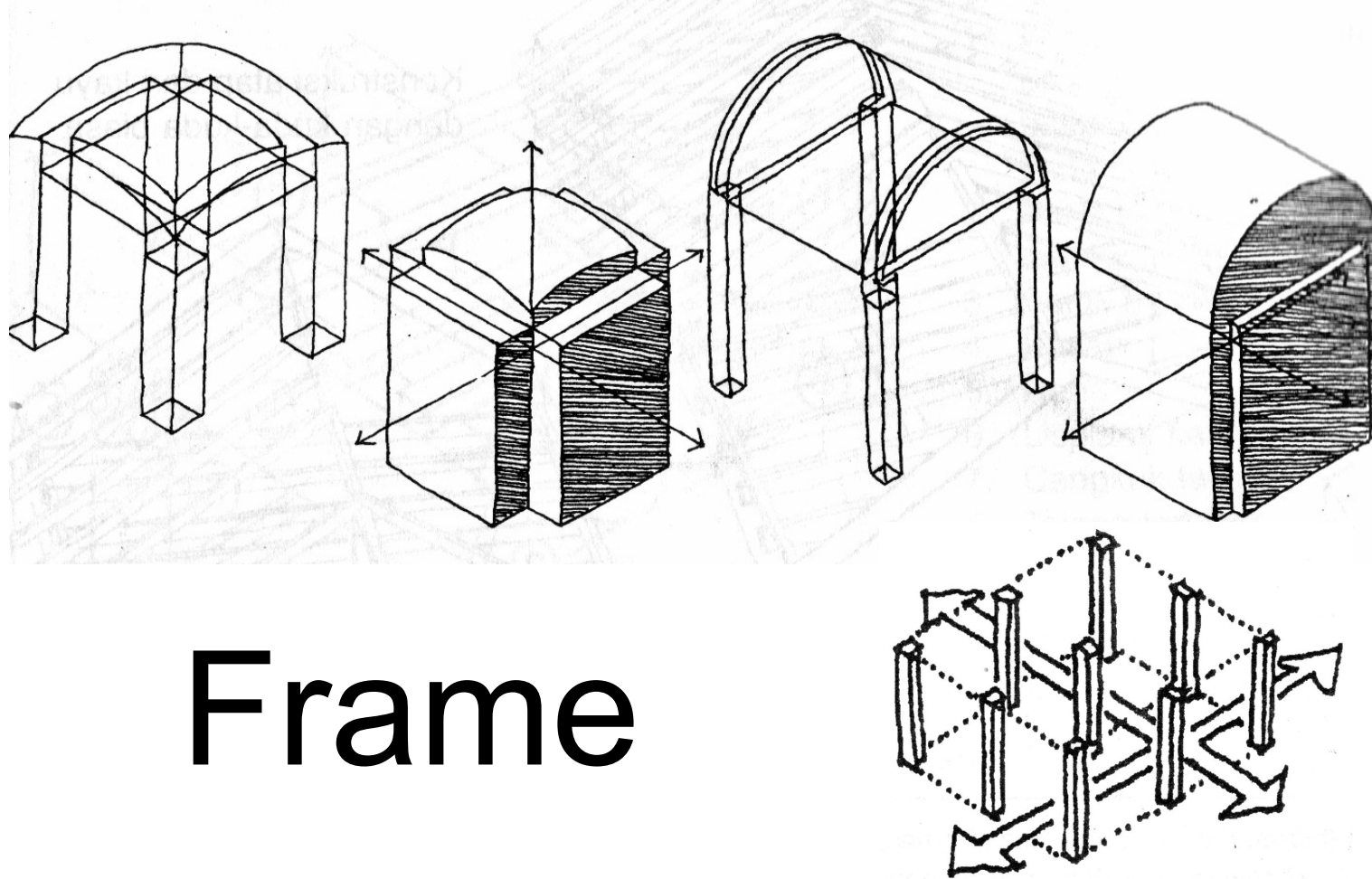


Reihenhäuser

Burghalde

(Stalder & Buol, 1998)

PERTEMUAN 2: SISTEM STRUKTURAL



Frame

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SEISMIC RESISTANT BUILDING

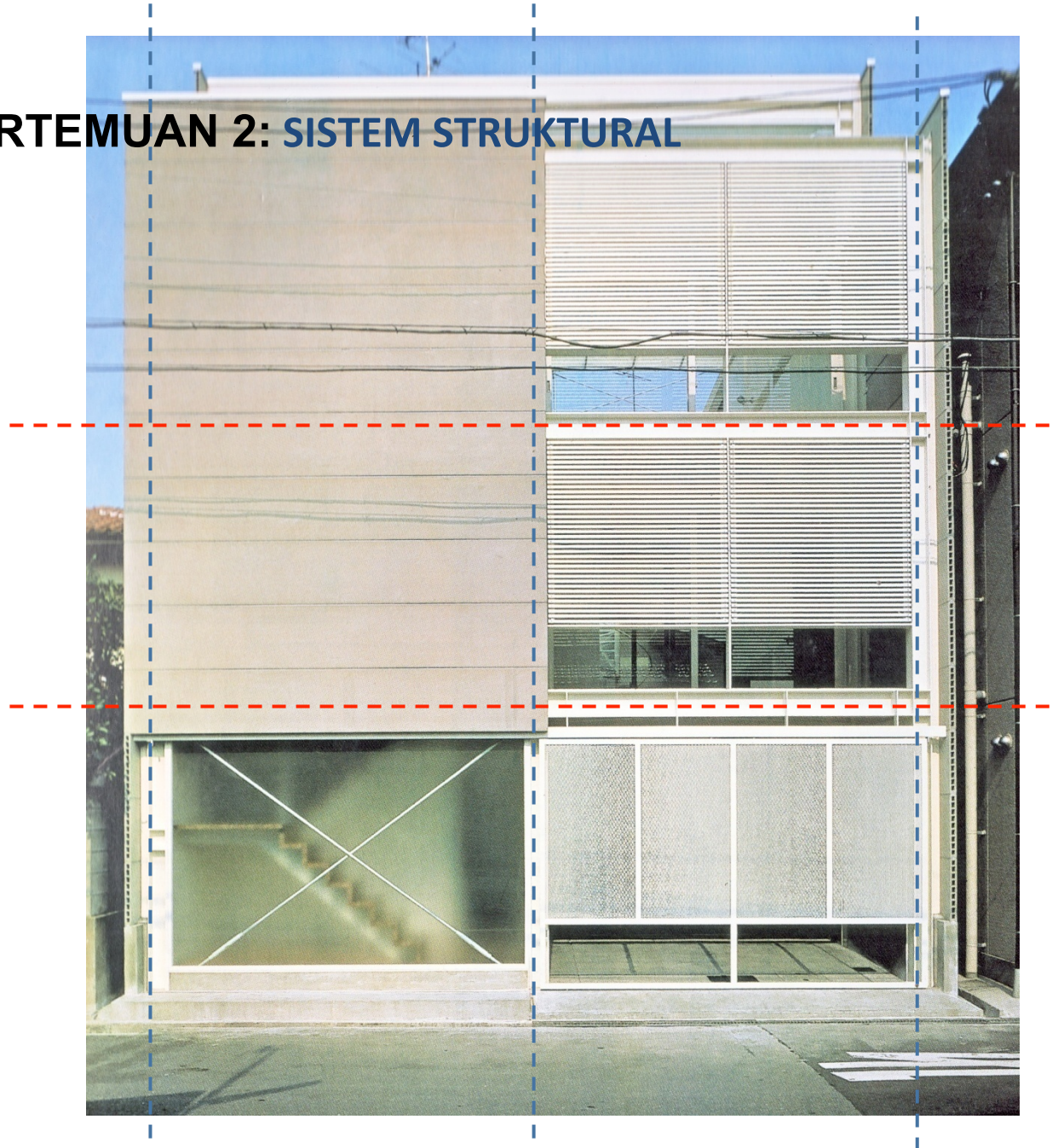
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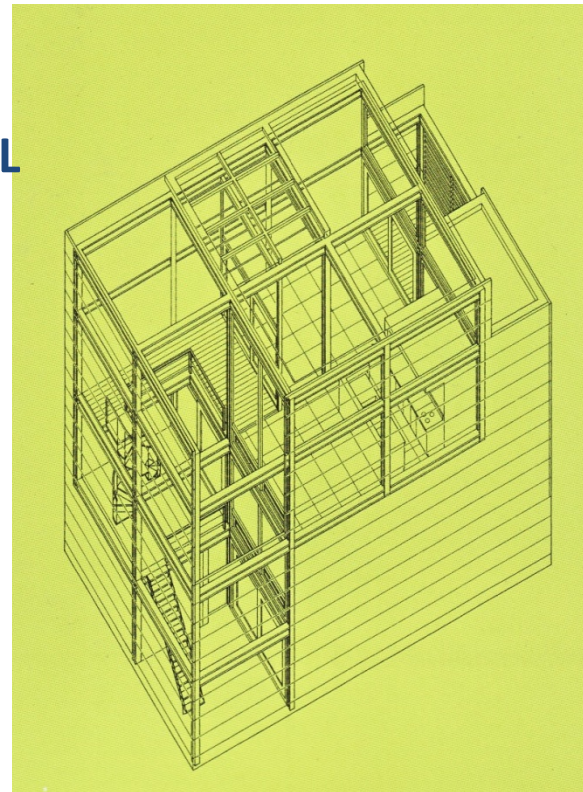
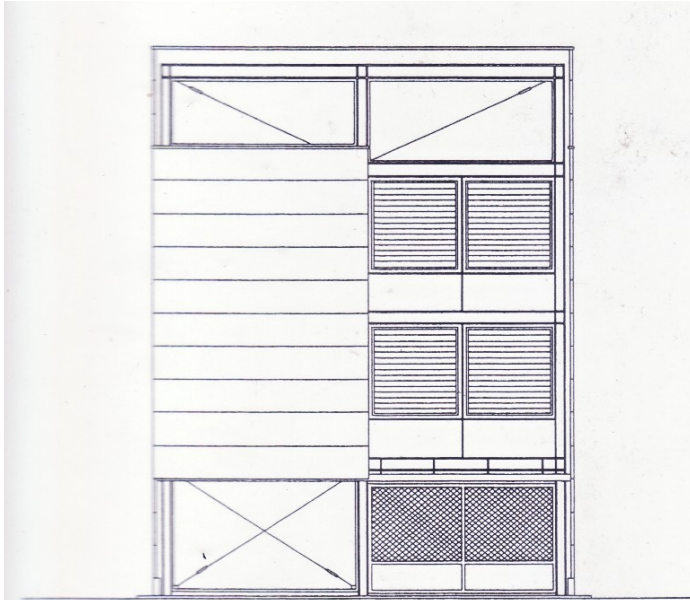
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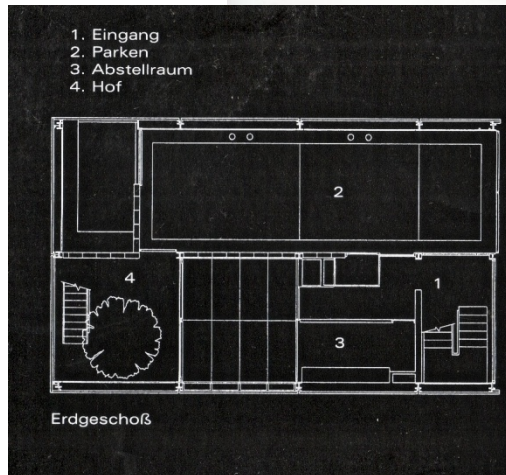
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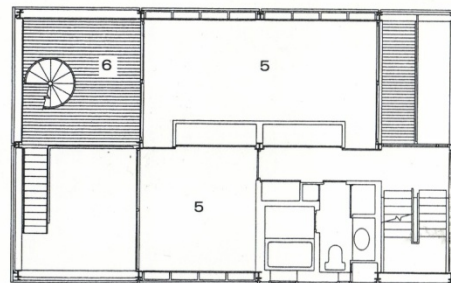
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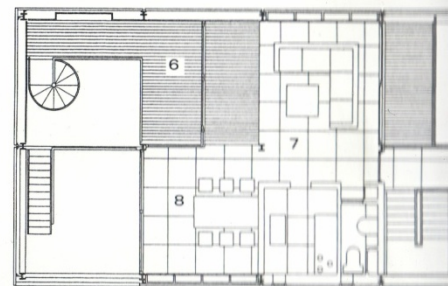


5. Zimmer
6. Terrasse



Erstes Obergeschoß

7. Wohnen
8. Essen



Zweites Obergeschoß

PERTEMUAN 2: SISTEM STRUKTURAL



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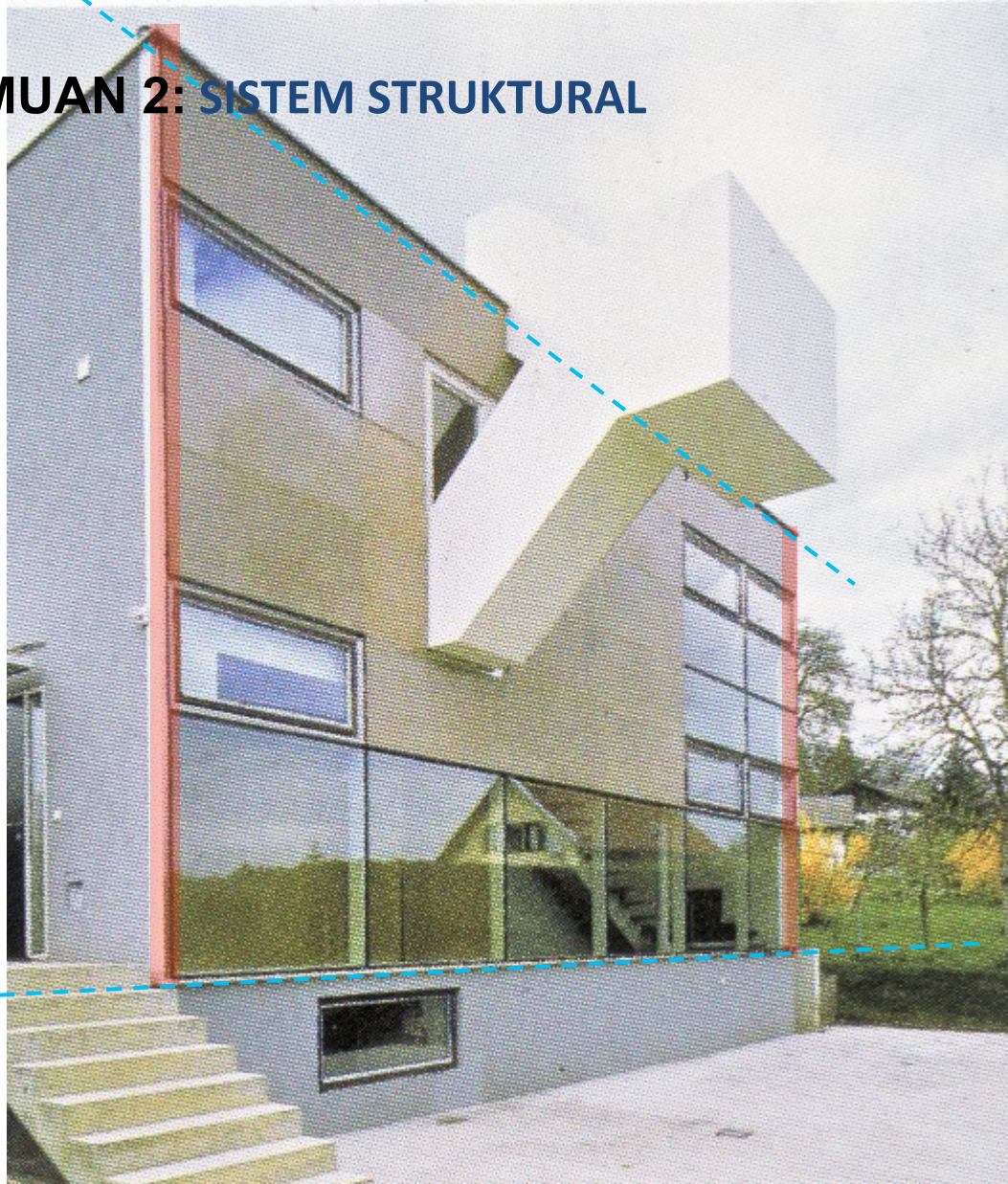
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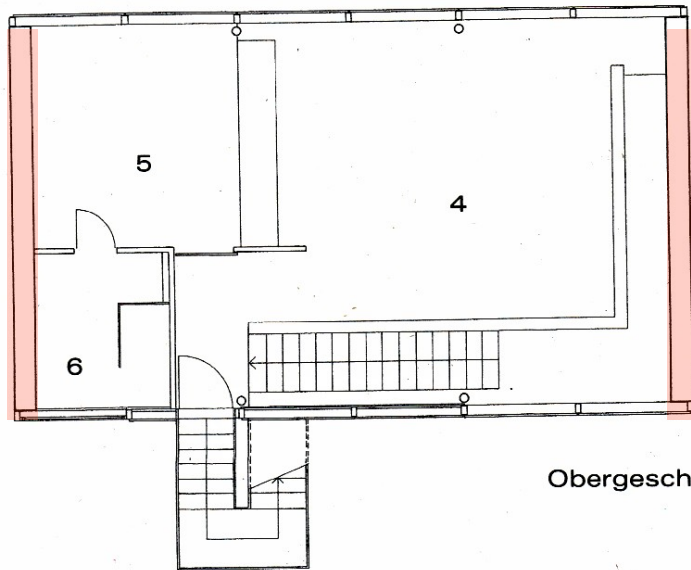
Topography

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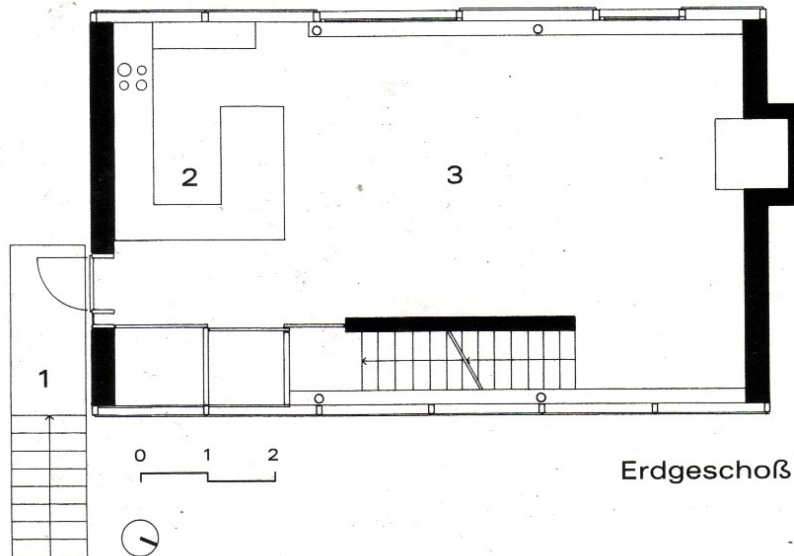
Design failure

Construction



Obergeschoß

- 4. Atelier
- 5. Zimmer
- 6. Bad



Erdgeschoß

- 1. Eingang
- 2. Küche
- 3. Wohnen / Essen

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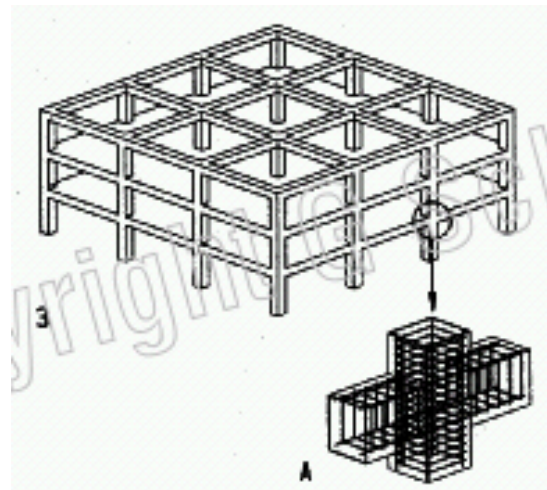
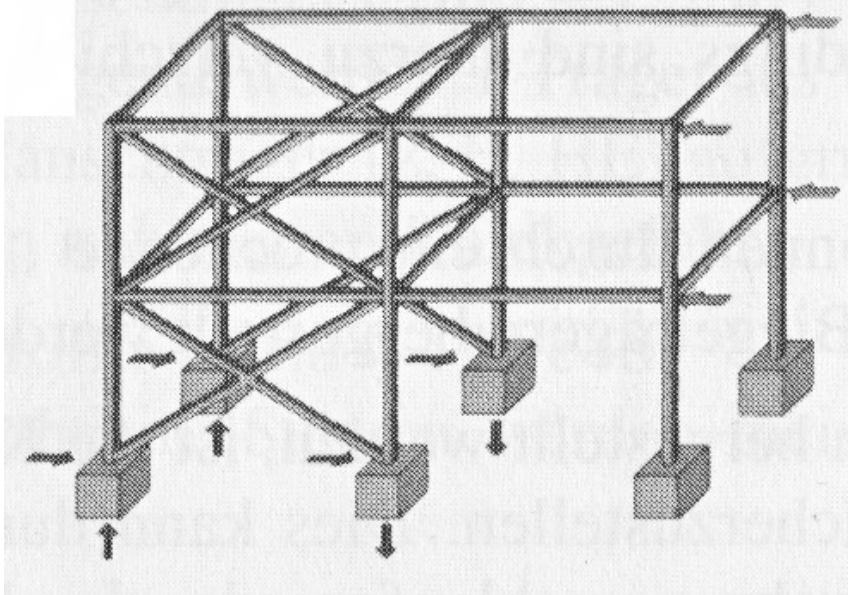
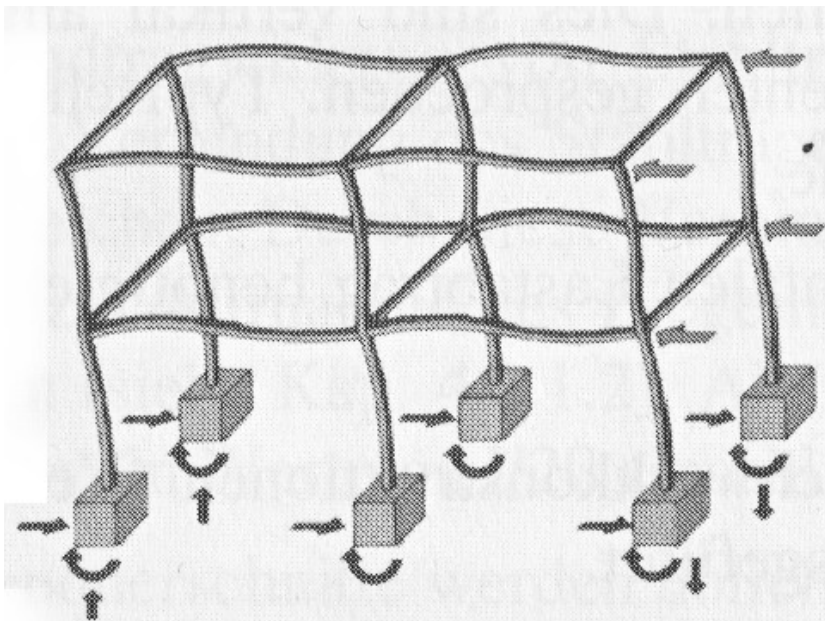
Topography

SEISMIC RESISTANT BUILDING

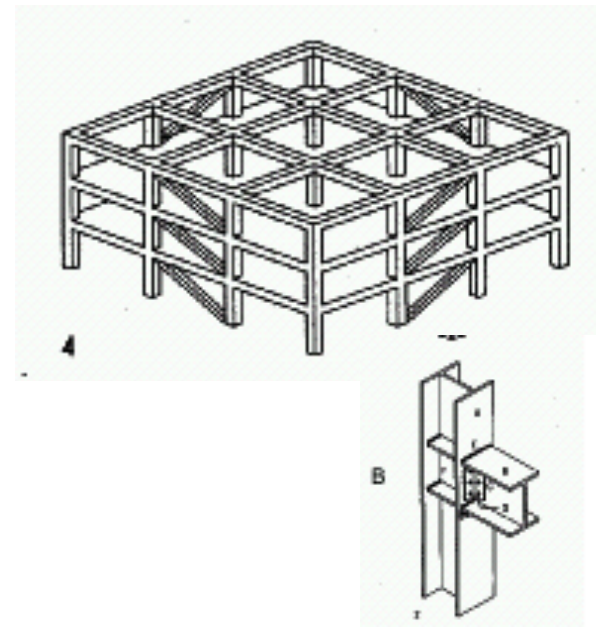
Phenomenon

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Moment Frame



Braced Frame

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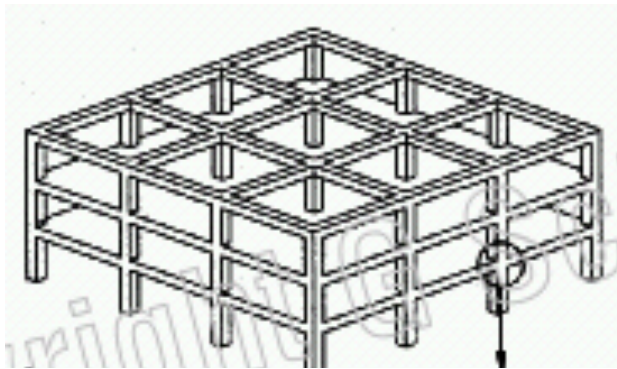
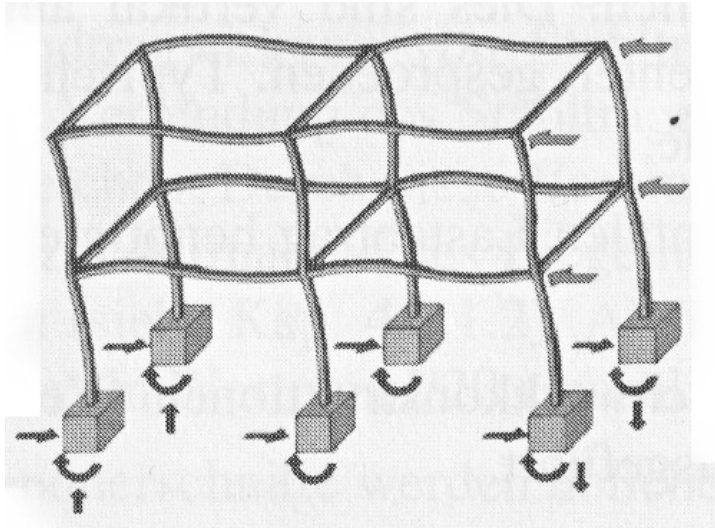
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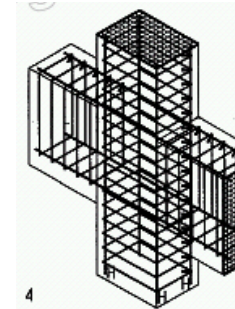
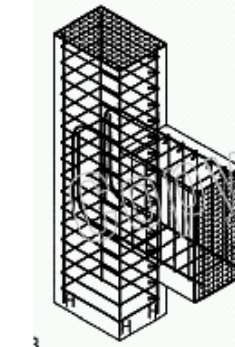
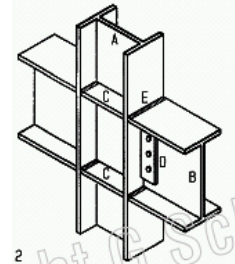
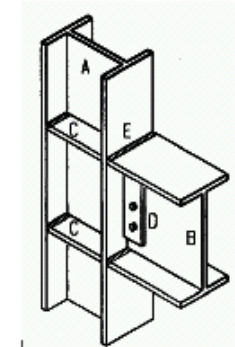
Design failure

Construction



Moment Frames

consist of one or more portals with columns joint to beams by moment resistant connections that transmit bending deformation from columns to beam and vice versa.



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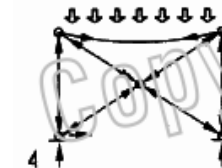
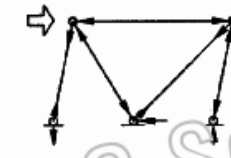
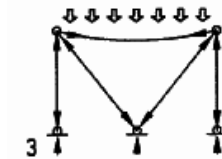
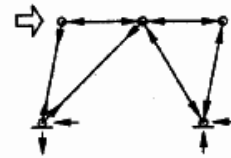
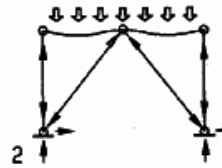
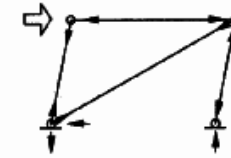
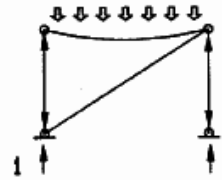
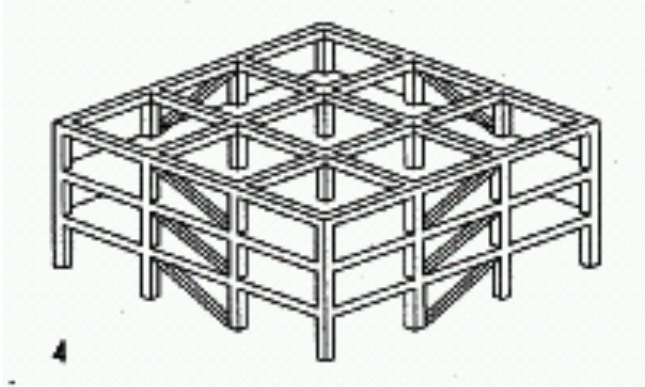
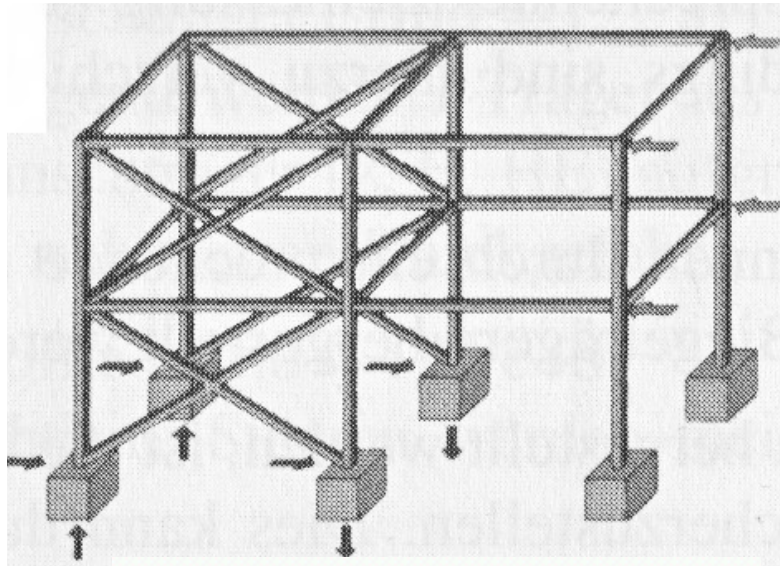
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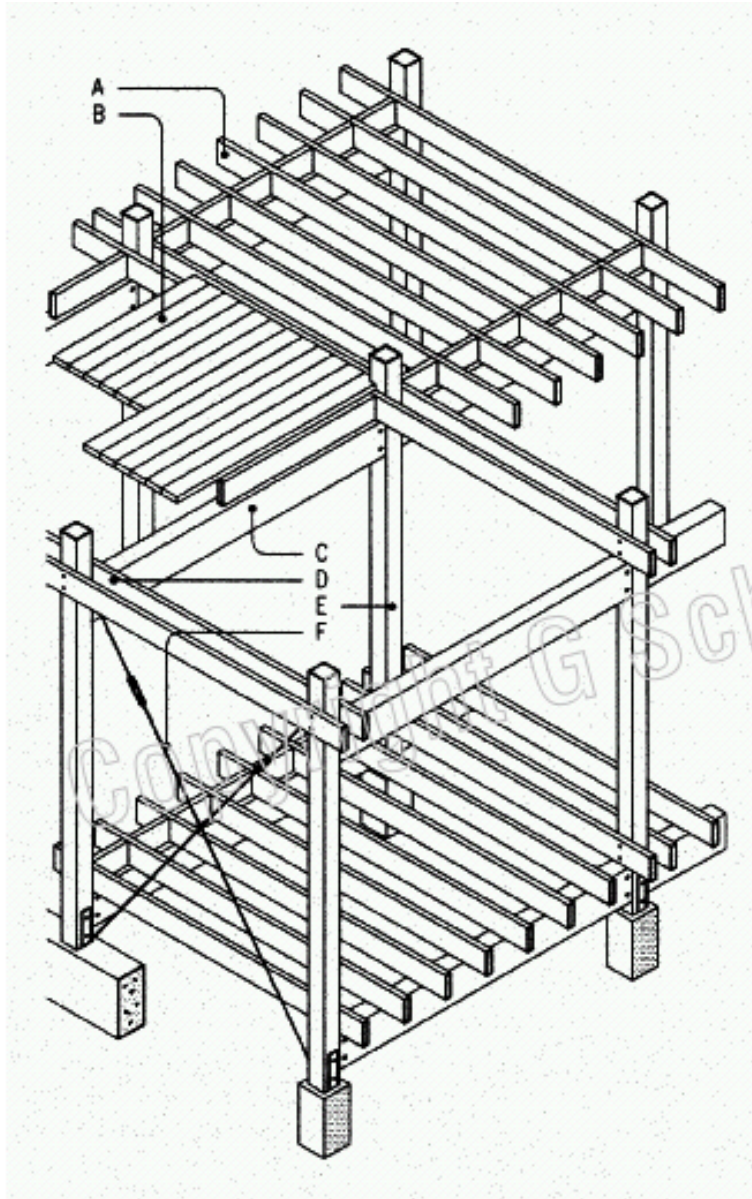
Phenomenon

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Braced Frames

Resist gravity load in bending and axial compression, and lateral load in axial compression and tension by triangulation, much like trusses



Timber Frame

- A. Joists provide intermediary support floor or roof deck
- B. Planks directly supported on beams
- C. Single beams require some device to connect them to column
- D. Twin beams bolted to column, allow pipes, etc to pass between
- E. Post
- F. Cross bracing resist lateral wind and seismic load

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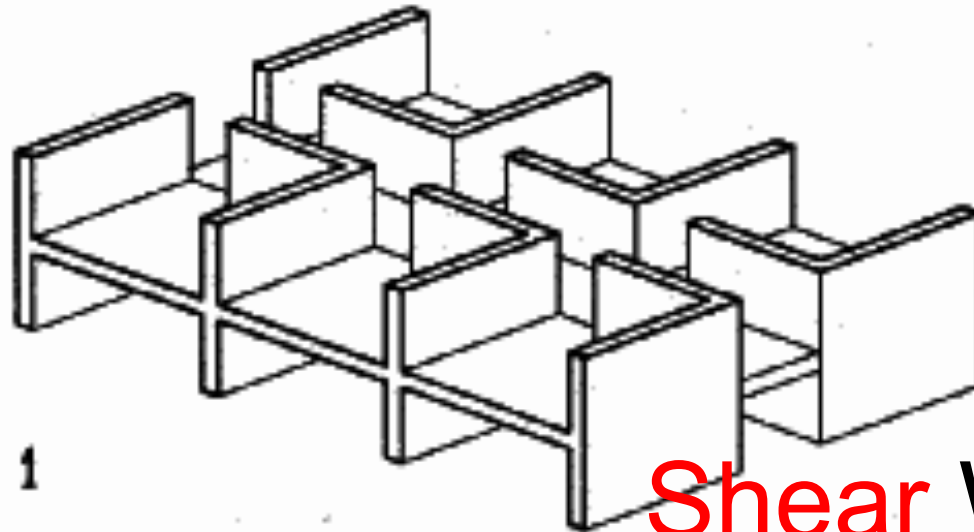
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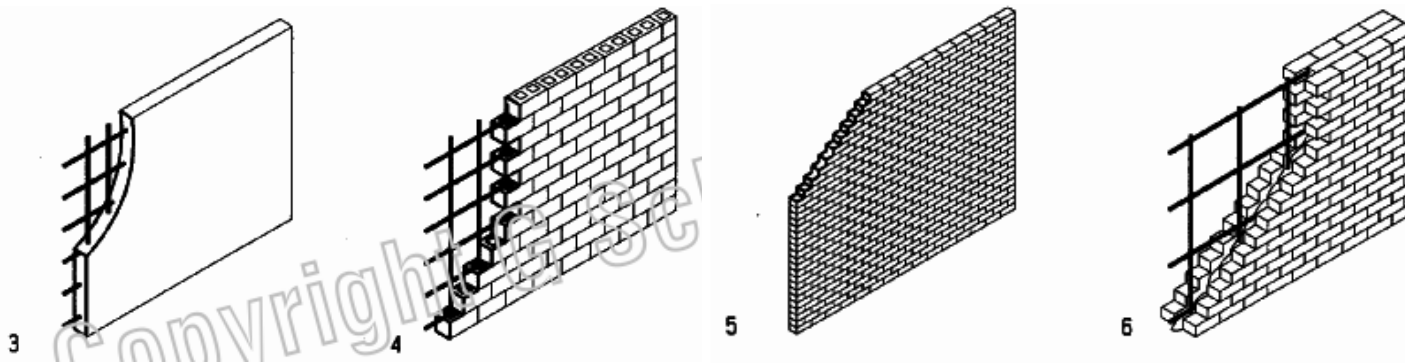
Construction

PERTEMUAN 2: SISTEM STRUKTURAL



Shear Walls

As`the name imlies, it resists lateral load in shear



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PERTEMUAN 2: SISTEM STRUKTURAL

Moment Frame	<p>Most flexible</p> <p>Ductile, absorbs seismic force</p>	<p>Expensive, drift may cause problems</p> <p>Tall structures need additional stiffening</p>
Braced Frame	<p>More flexible than shear walls</p> <p>Very stiff, good for wind resistance</p>	<p>Less flexible than moment frame</p> <p>Stiffness increases seismic forces</p>
Shear Walls	<p>Good for apartment or hotel</p> <p>Very stiff, good for wind resistance</p>	<p>Inflexible for future changes</p> <p>Stiffness increases seismic forces</p>

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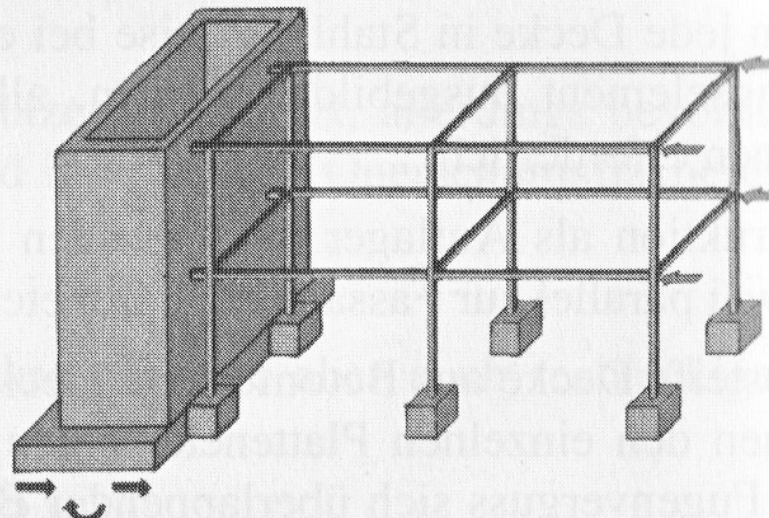
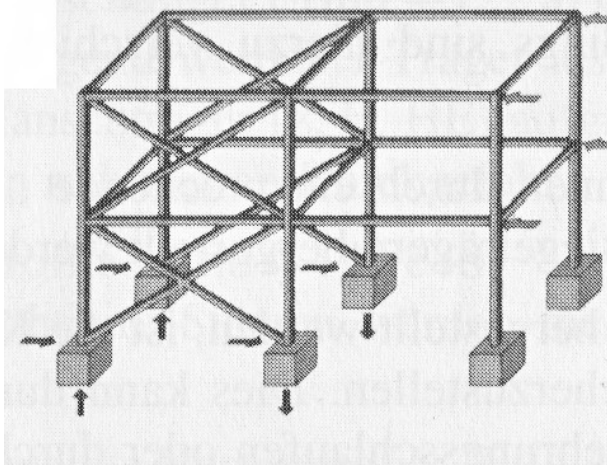
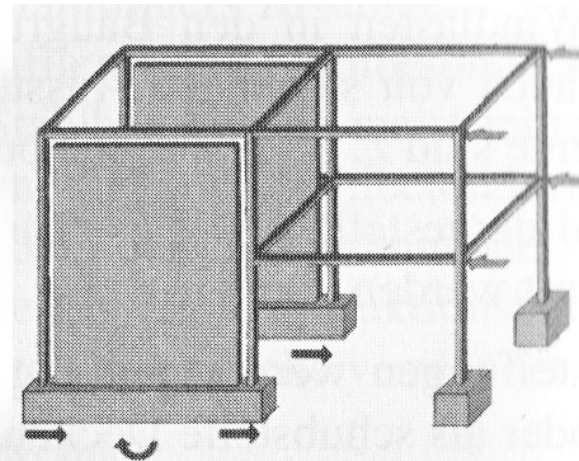
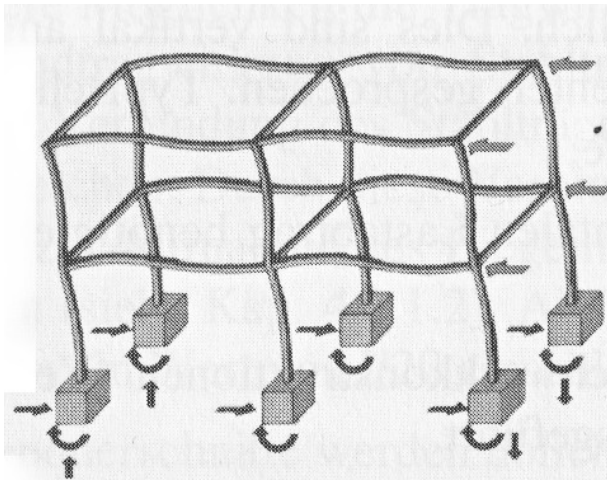
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Frame Structure + Shear Walls

DRA family house,
a steel construction suspended by *querkraft* architect



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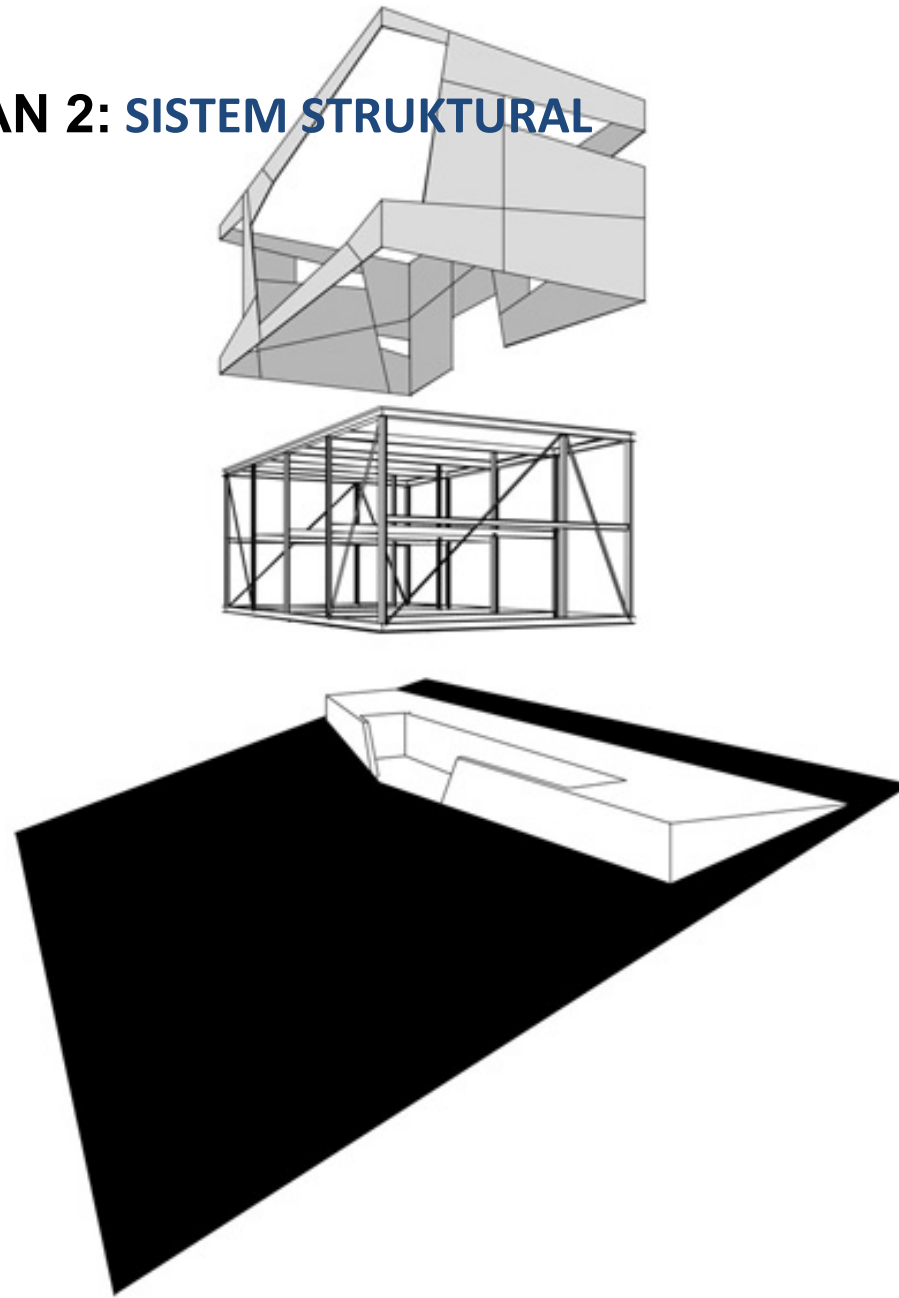
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