

# PERENCANAAN TEKNOLOGI & SISTEM BANGUNAN (PTSB) 03

# How **architects** running their job?

OUTLINE

**BUILDING  
SYSTEMS**

**Basic concept**

Structural systems

Topography

SEISMIC  
RESISTANT  
BUILDING

Phenomenon

Design failure

Construction



## OUTLINE

### **BUILDING SYSTEMS**

Basic concept  
Structural systems  
Topography

SEISMIC RESISTANT BUILDING  
Phenomenon  
Design failure  
Construction



## OUTLINE

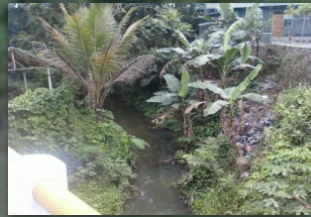
### **BUILDING SYSTEMS**

Basic concept  
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**Topography**

### SEISMIC RESISTANT BUILDING

Phenomenon  
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Construction

Putuskan secara tepat dan cermat apa yang akan dipelajari dari keberadaan tapak





# tapak

POTONGAN 1-1

BIDANG PERSAMAAN 385



ELEVASI	36.41	36.42	36.43	36.44	36.45	36.46	36.47	36.48	36.49	36.50	36.51	36.52	36.53	36.54	36.55	36.56	36.57	36.58	36.59	36.60
JARAK	1.00	13.85	4.35	12.96	2.08	5.20	1.89	9.08	4.28	4.29	14.08	5.28	1.08	11.90	1.80	7.94				

POTONGAN 2-2

BIDANG PERSAMAAN 385



ELEVASI	36.41	36.42	36.43	36.44	36.45	36.46	36.47	36.48	36.49	36.50	36.51	36.52	36.53	36.54	36.55	36.56	36.57	36.58	36.59	36.60
JARAK	348.543	13.97	6.41	8.28	7.62	2.07	1.80	13.57	7.85	16.74	13.38	0.96	17.08	1.57	8.29	1.25	9.48			

POTONGAN 3-3

BIDANG PERSAMAAN 380



ELEVASI	36.41	36.42	36.43	36.44	36.45	36.46	36.47	36.48	36.49	36.50	36.51	36.52	36.53	36.54	36.55	36.56	36.57	36.58	36.59	36.60
JARAK	3.30	12.85	15.14	0.94	10.20	14.46				47.08			3.43	10.28	12.67	18.22	1.72	1.82	1.88	1.62

POTONGAN 4-4

BIDANG PERSAMAAN 385



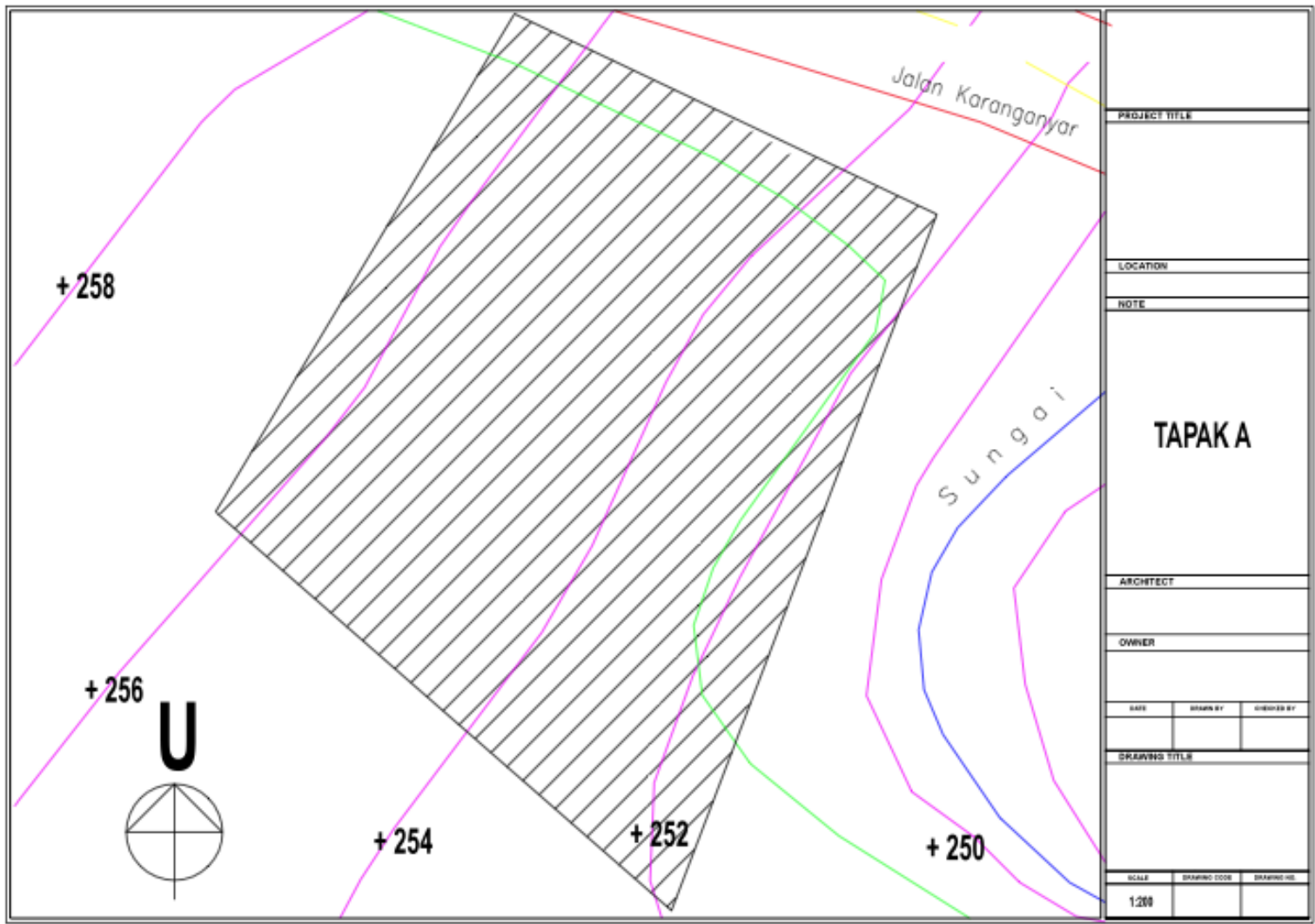
ELEVASI	36.41	36.42	36.43	36.44	36.45	36.46	36.47	36.48	36.49	36.50	36.51	36.52	36.53	36.54	36.55	36.56	36.57	36.58	36.59	36.60	
JARAK	1.40	17.85	9.88	9.84	11.70	5.85	12.17			45.85	3.76	11.78	0.97	5.48	1.07	16.50	0.85	9.61	2.43	8.11	4.50



PROJECT  
 RENCANA STRUKTUR  
 JUSAS GEMELAK  
 SIKLAK, MALAKA

DATE  
 06/10/2018

DESIGNER  
 D. Pappadouras (Sark Tru. II)  
 +62 2452 4454 (RM) 0300547  
 Semarang



**OUTLINE**

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Basic concept  
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Topography

**SEISMIC RESISTANT BUILDING**

Phenomenon  
Design failure  
Construction

Persiapkan peta survey berskala sesuai dengan kondisi lapangan





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**Tapak A**



**Tapak A**

SKEL MOBIL  
MELAKSAKANA



**Tapak B**



**Tapak B**

## Notasi umum yang digunakan dalam survey teknik



Titik penanda sementara



Titik penanda penting



Titik acuan tetap (*benchmark*)

139.95

*Spot height* (titik ketinggian)

+ 139.95

*Spot height* (titik ketinggian)

± 139.95

*Spot height* (titik ketinggian)

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Di atas permukaan

Di bawah permukaan

Arti



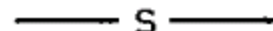
Garis jaringan atau pipa



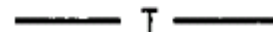
Jaringan air hujan (*drain*)



Jaringan listrik (*electricity*)



Jaringan air limbah (*sewer*)



Jaringan telepon (*telephone*)



Jaringan air bersih (*use water*)



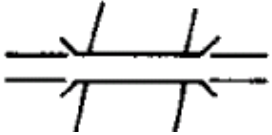
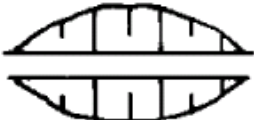
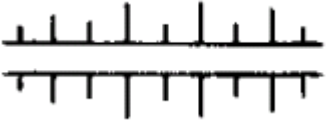
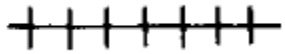
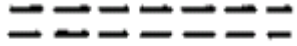
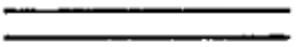

Katup (*valve*)

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Simbol	Arti
	Jembatan
	Bidang tanah yang terpotong
	Tambak atau tanggul
	Rel kereta api
	Jalan tanpa marka pembatas
	Jalan dengan marka pembatas
	Jalan eksisting atau yang dianggap sebagai jalan

OUTLINE

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SEISMIC RESISTANT BUILDING

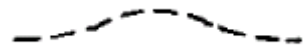
Phenomenon  
Design failure  
Construction



Simbol	Arti
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Jalan yang sedang direncanakan



*Track* atau jalan setapak



Pagar pada batas tapak



Pagar tidak pada batas tapak



*Traffic light*



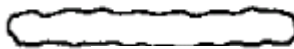
Telephone box



Hydrant



*Retaining wall*



Vegetasi



Pohon

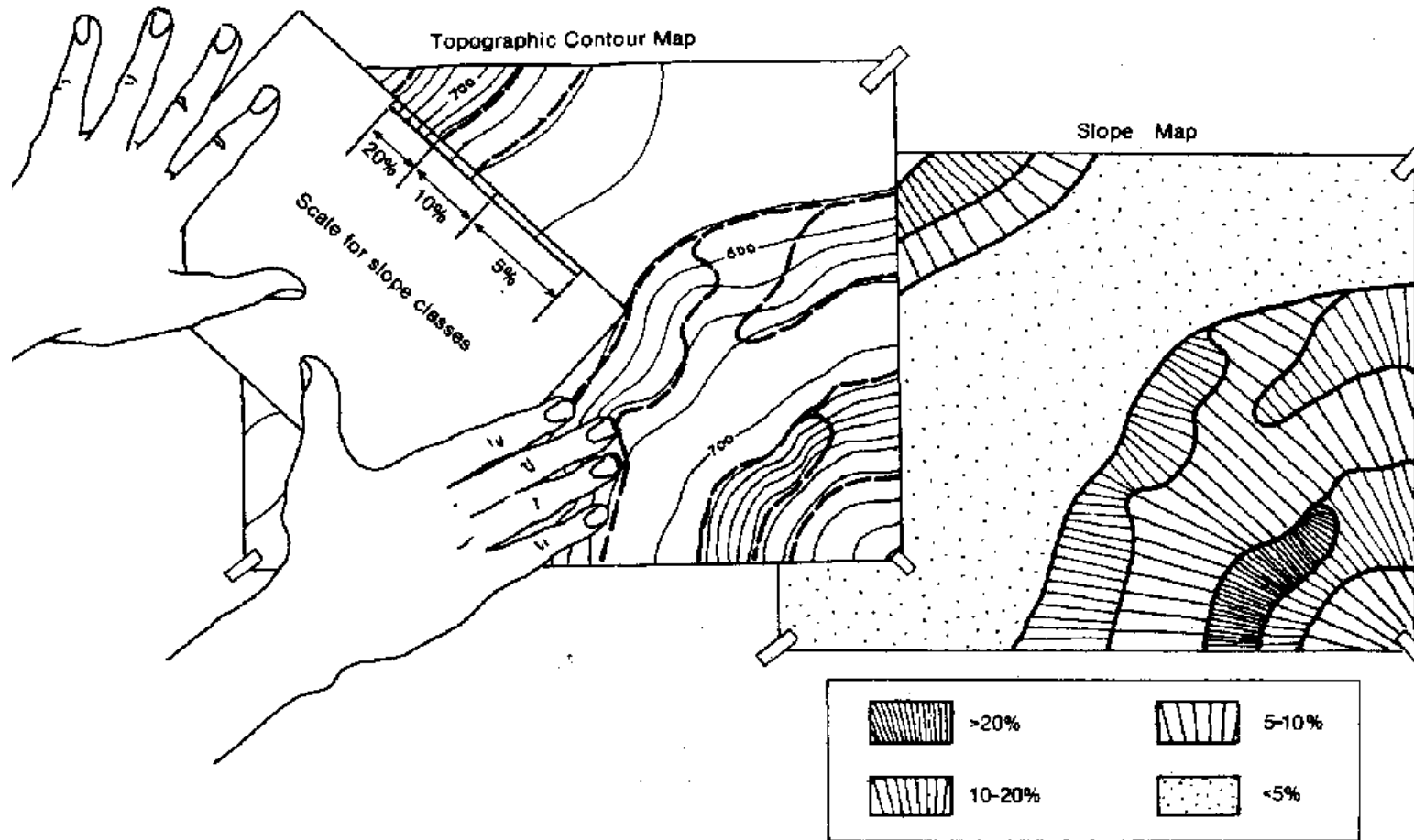
OUTLINE

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## Step 2 : Interpret your site's slope !



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- Grading formula
- $G=D/L$  or  $L=D/G$  or  $D=GL$
- Gradient percent =  $D/L * 100$

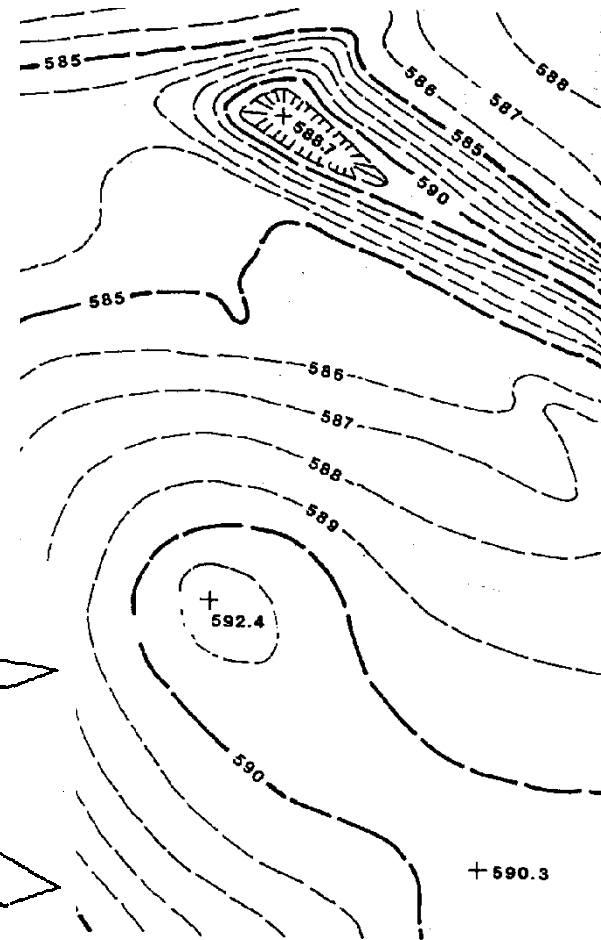
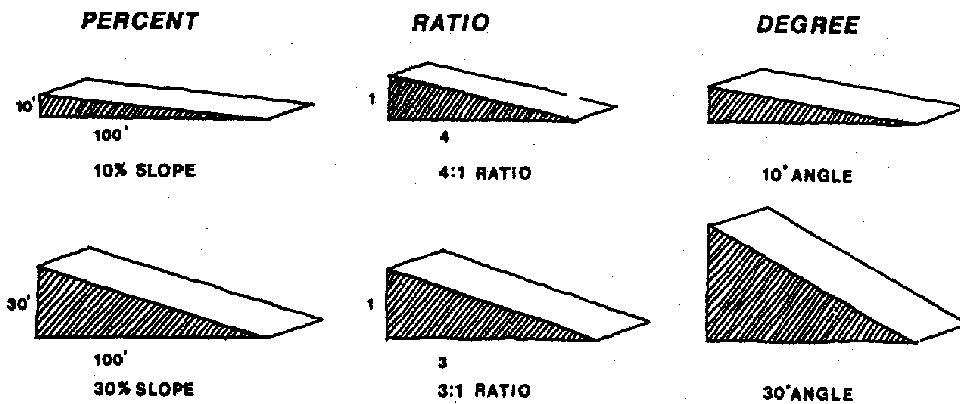


Figure 9-14 Summit and depression.

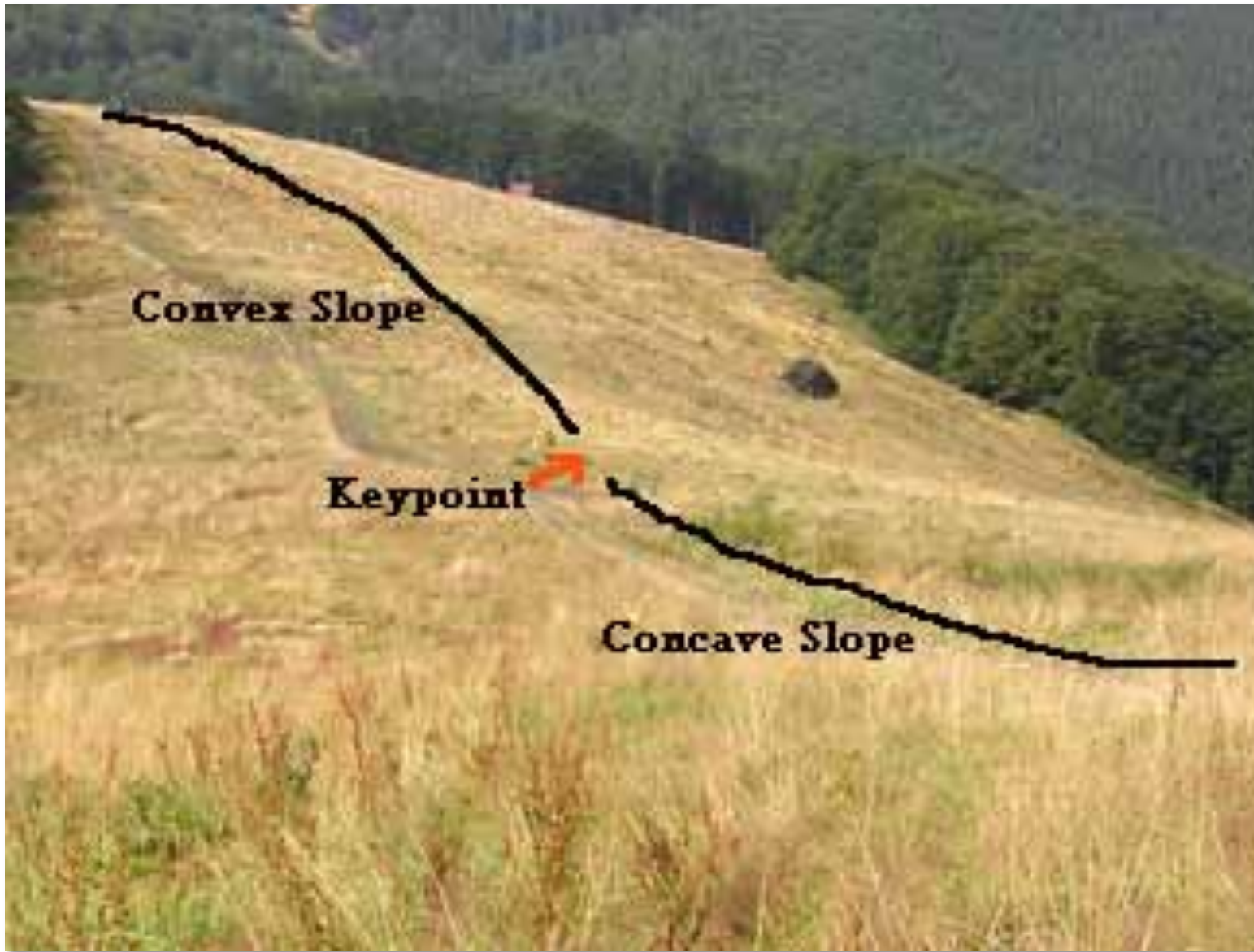
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Basic concept  
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# CUT & FILL



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# CUT & FILL



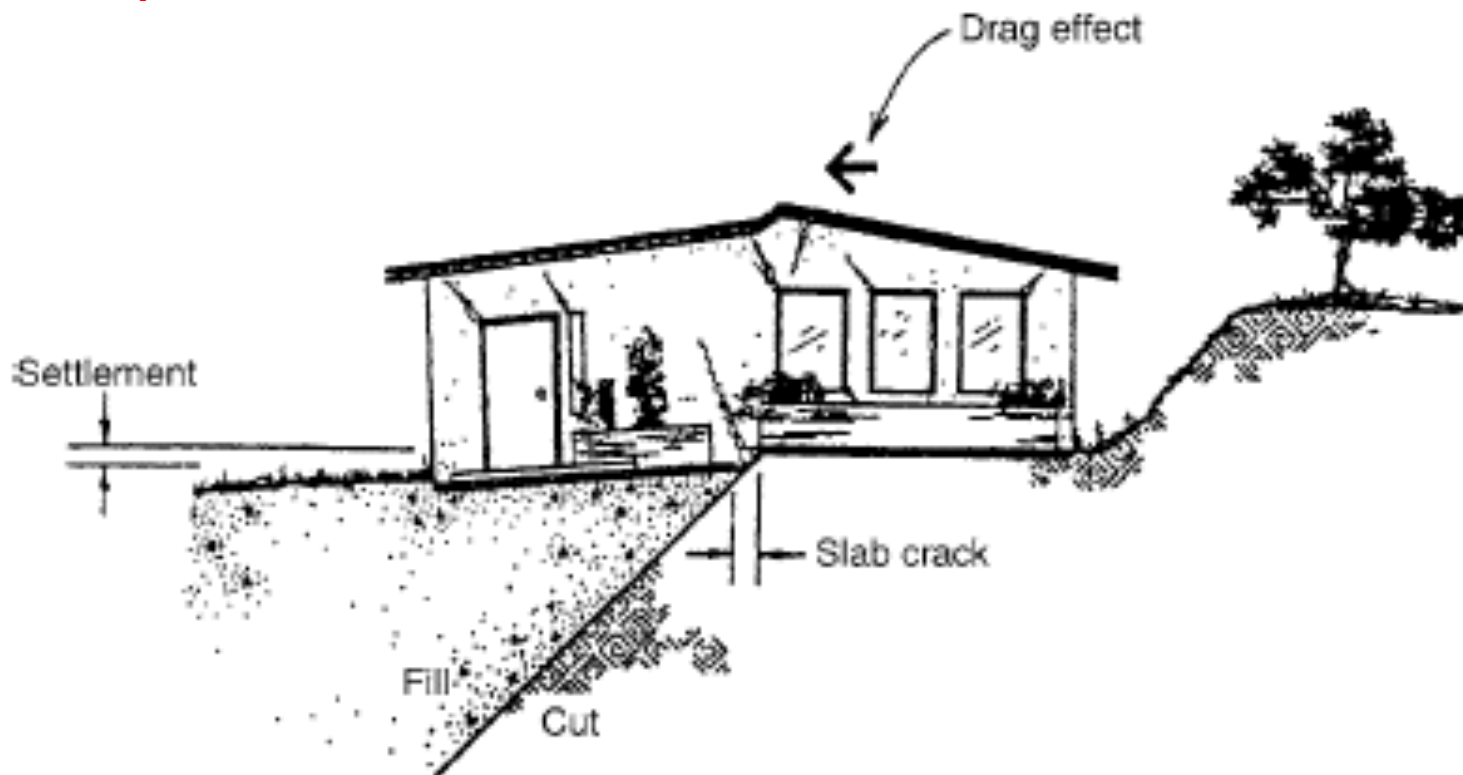
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## Step 3 : Avoid CUT & FILL !



Sumber: Robert W. D., **STRUCTURAL FOUNDATIONS AND RETAINING WALLS**, Mc Graw Hill, 2000

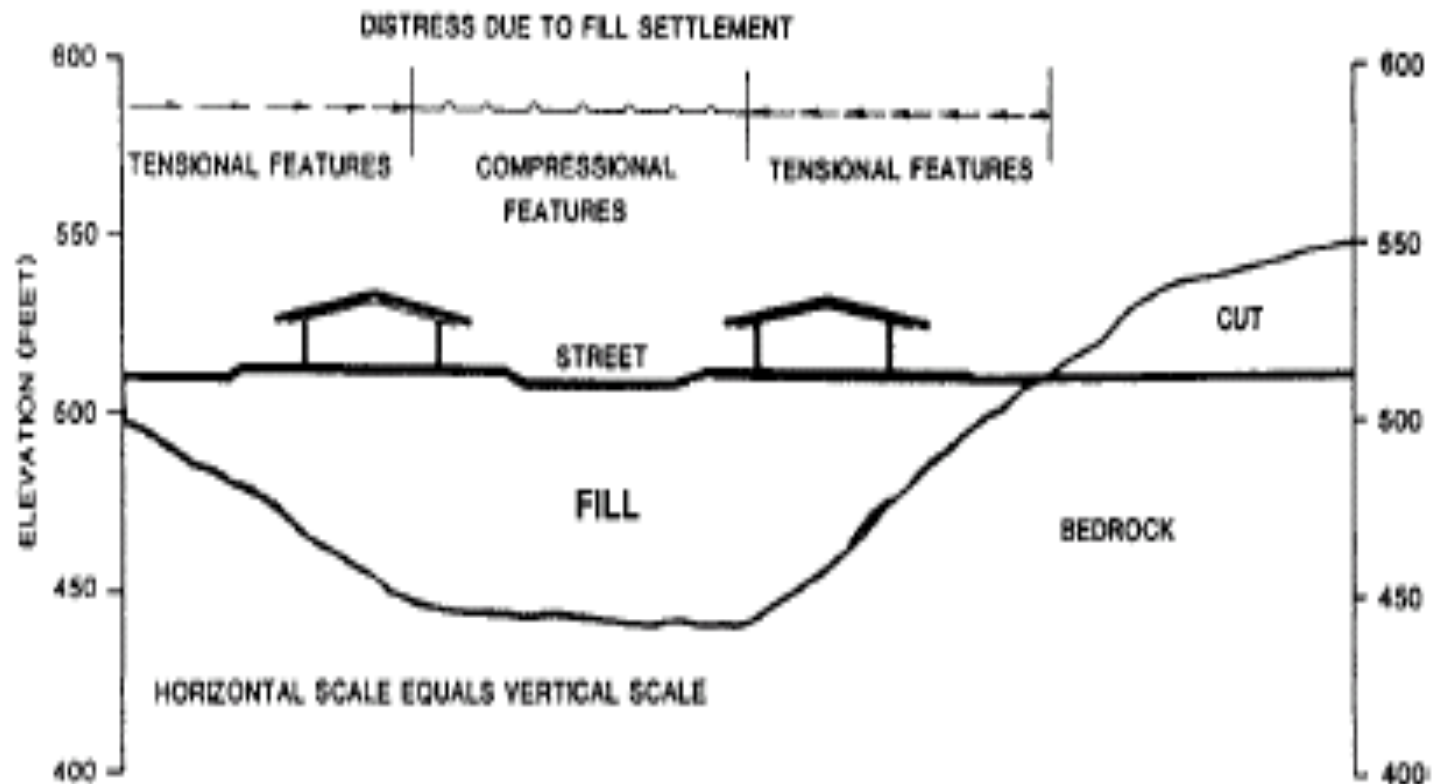
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## Step 3 : Avoid **CUT & FILL** !



**The Laguna Niguel landslide**  
March 19, 1998

Sumber: Robert W. D., *Slope Stability*, Foundation Engineering Handbook, Mc Graw Hill, 2006

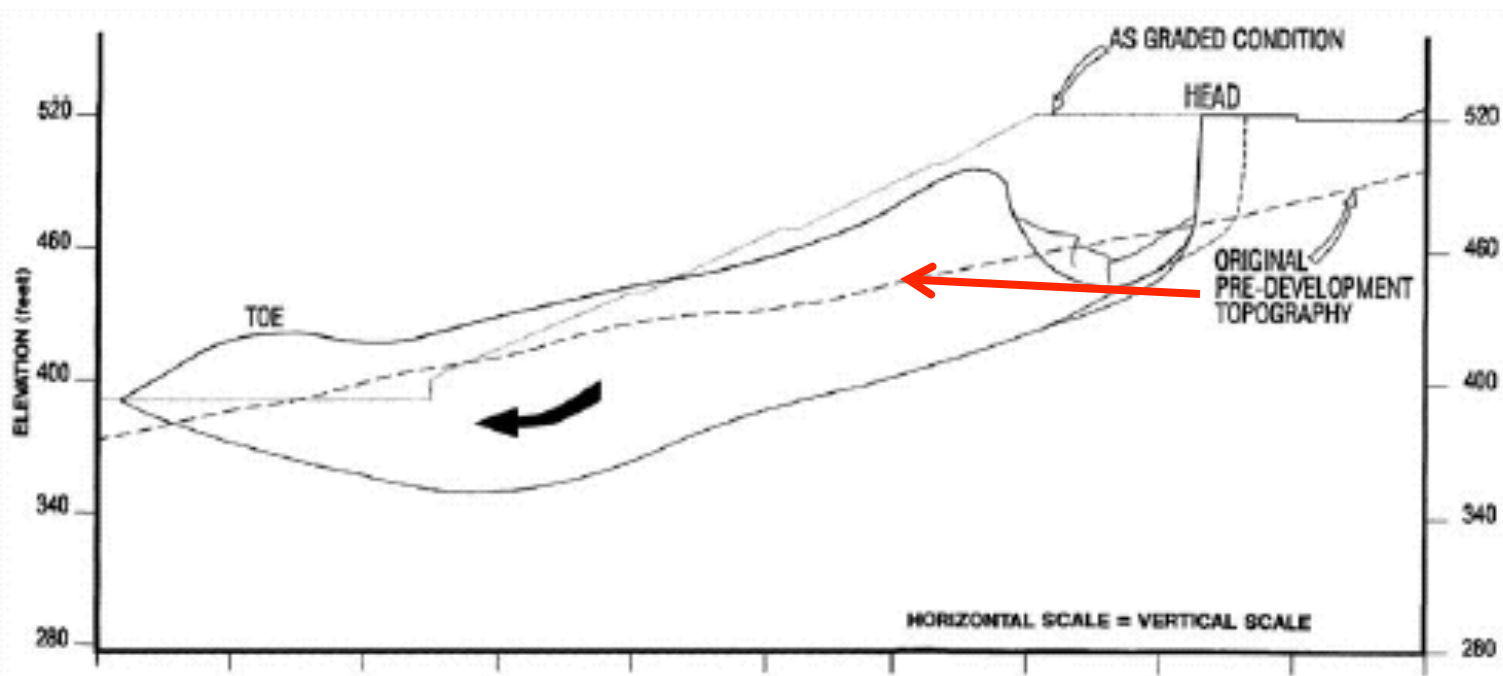
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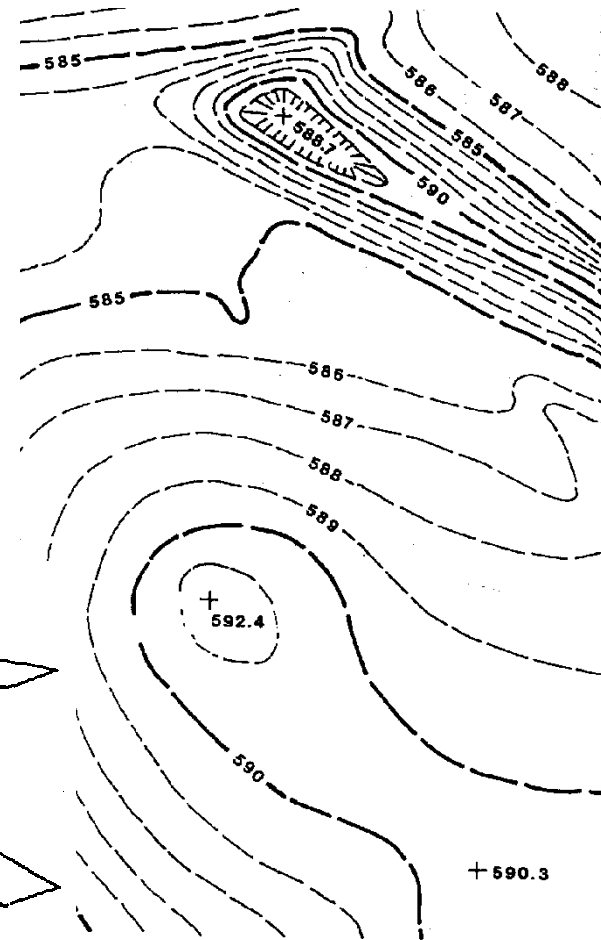
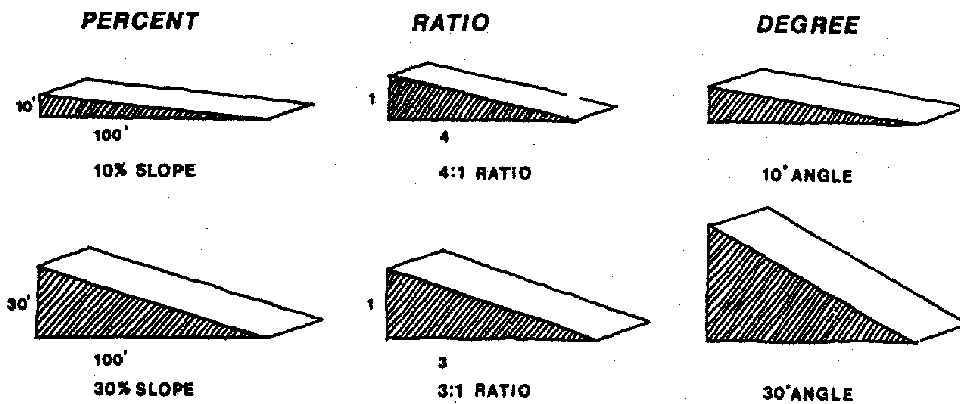


Figure 9-14 Summit and depression.

## OUTLINE

### BUILDING SYSTEMS

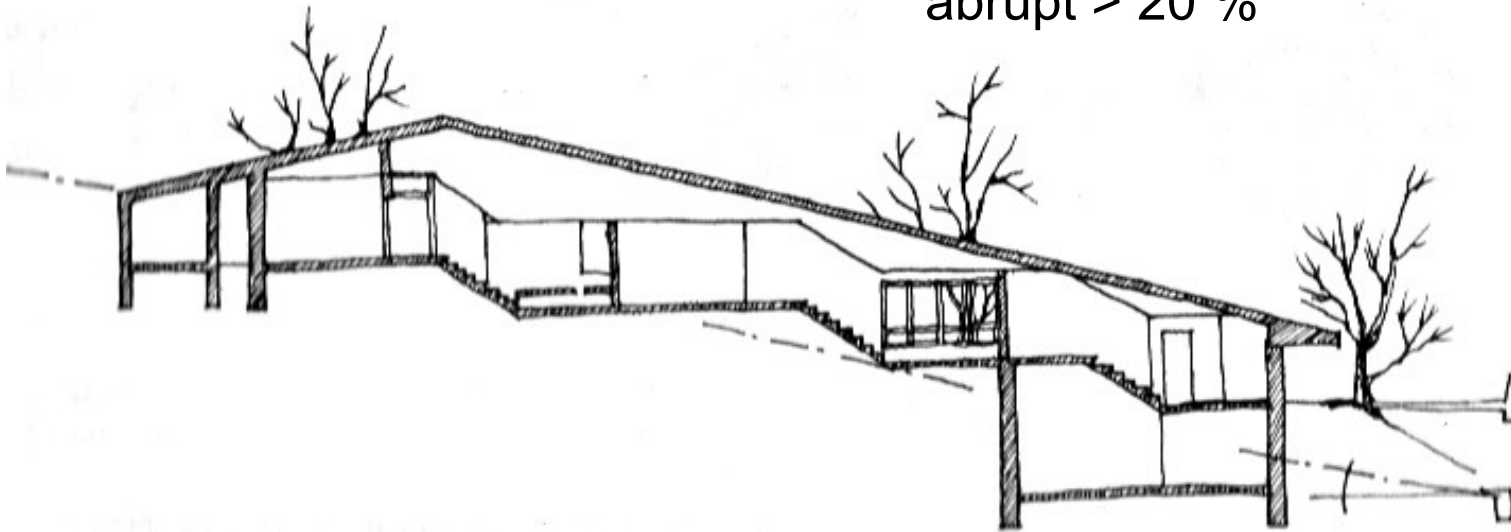
Basic concept  
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Phenomenon  
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## Step 4 : Determine an appropriate structure

slope < 10%  
steep slope 10 – 20 %  
abrupt > 20 %



**Split level <10%**

### OUTLINE

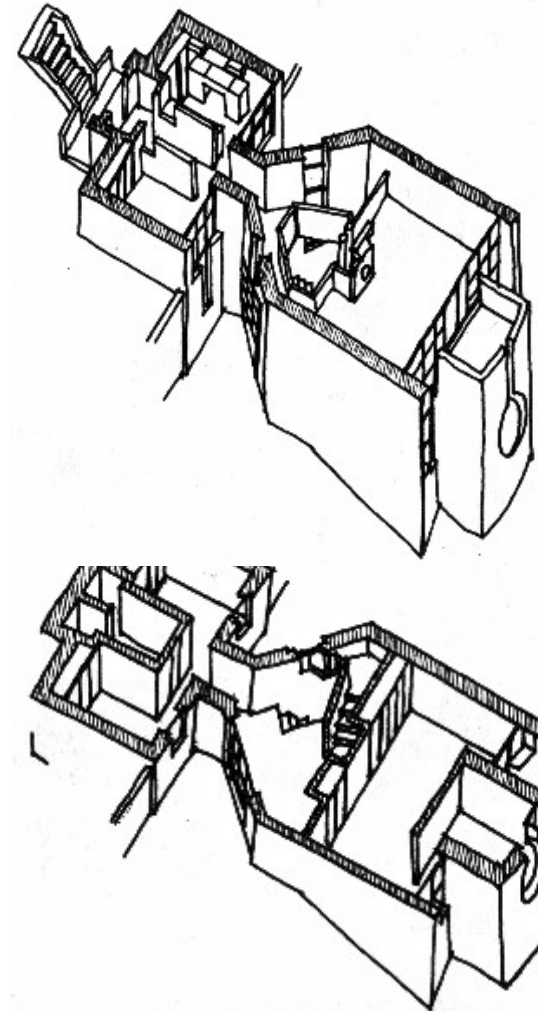
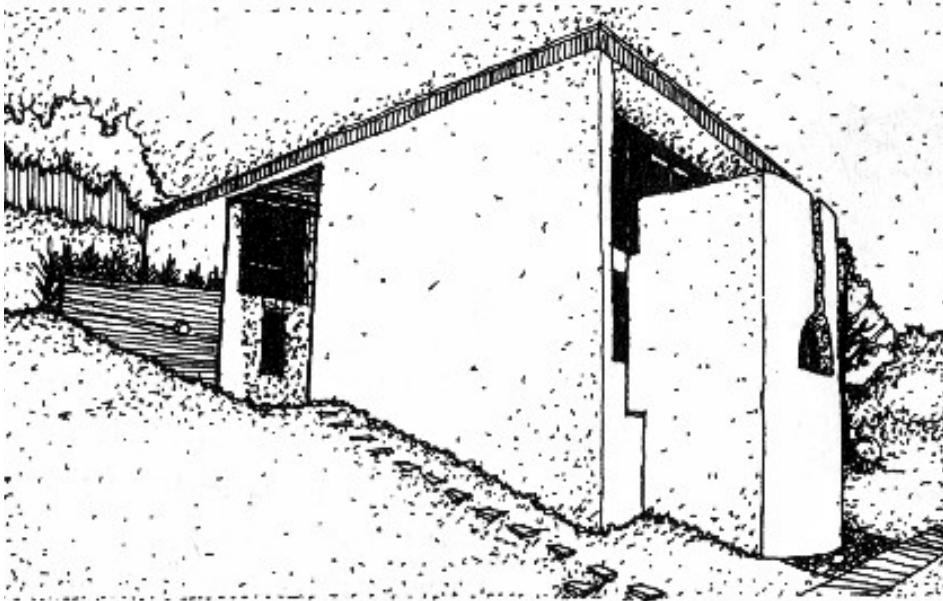
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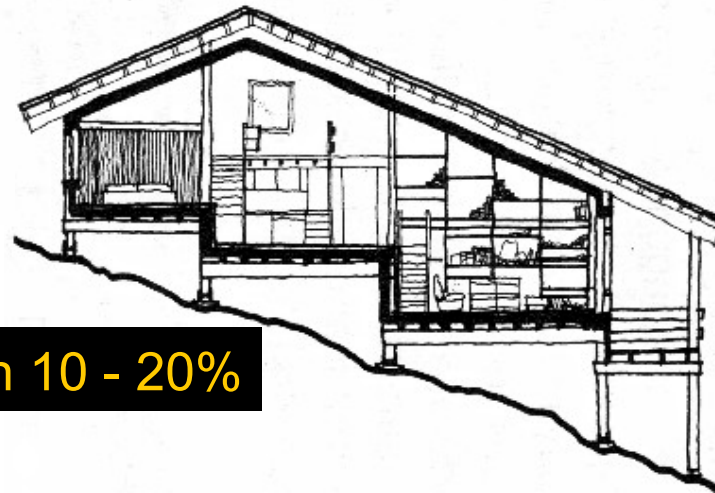
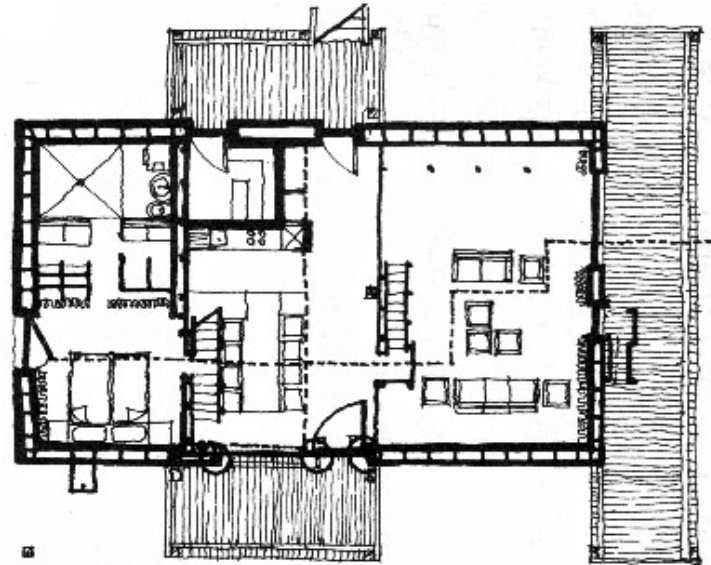
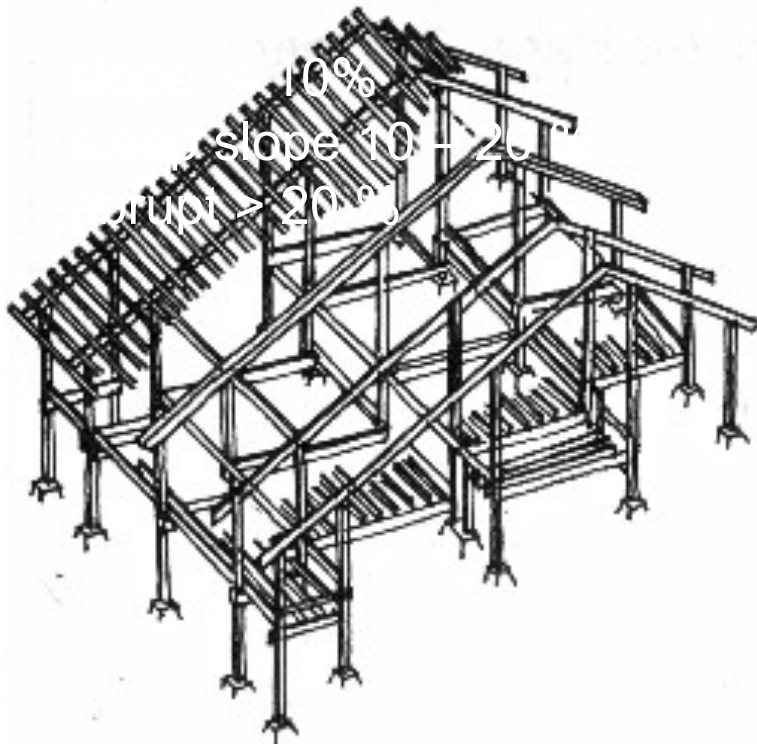
### BUILDING SYSTEMS

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**Rumah sengkedan di lerengan 10 - 20%**

## Step 4 : Determine an appropriate structure



**Rumah sengkedan di lerengan 10 - 20%**

OUTLINE

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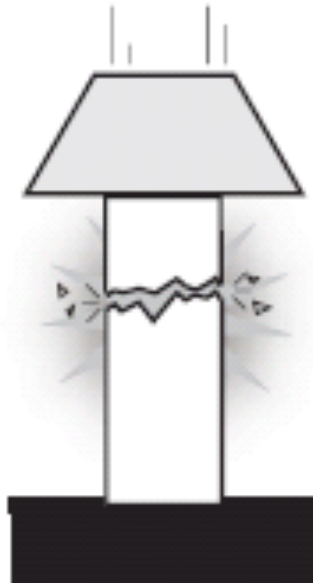
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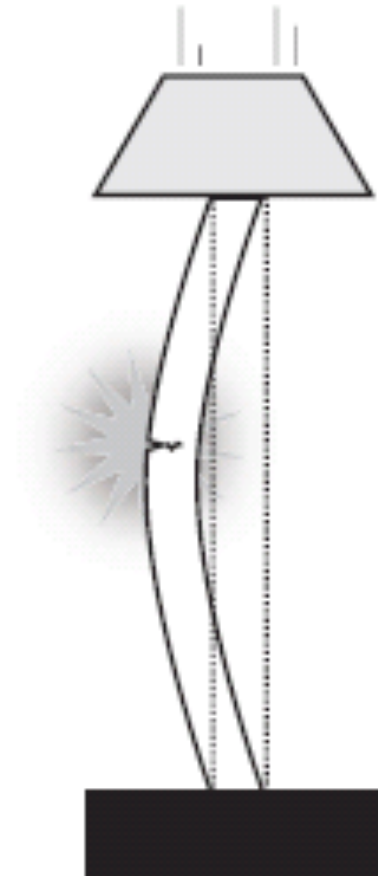
## Step 4 : Determine an appropriate structure



Failure in Tension



Failure in Compression  
(Crushing)



Failure in Compression  
(Buckling)

### OUTLINE

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Source: <http://www.housedesigntrend.com/contemporary-house/beverly-skyline-house>

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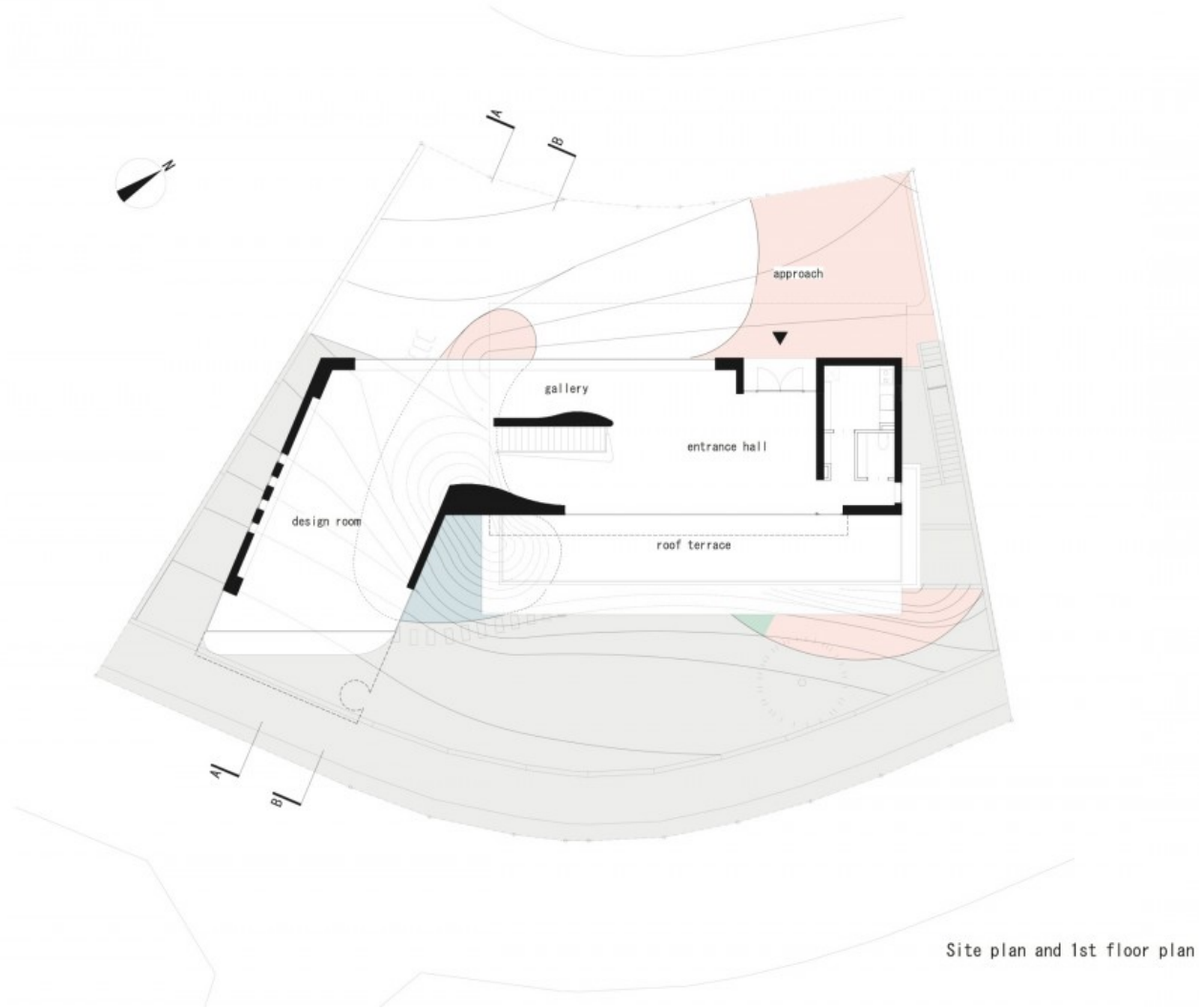
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<http://www.archdaily.com/68593/mountains-opening-house-eastern-design-office/>

# Mountains & Opening House

scale=1:200



<http://www.archdaily.com/68593/mountains-opening-house-eastern-design-office/>

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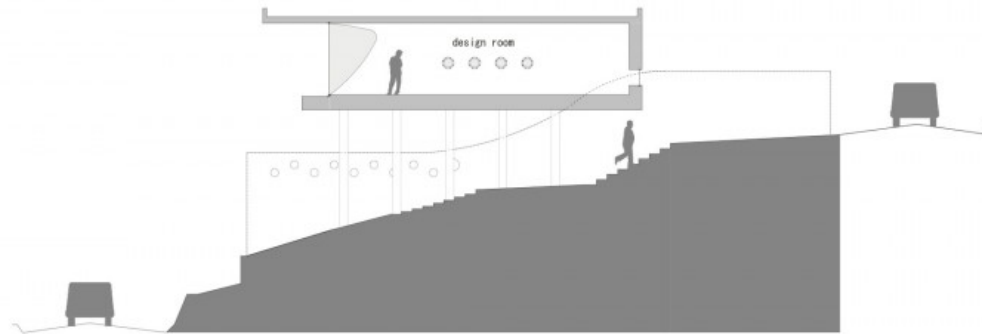
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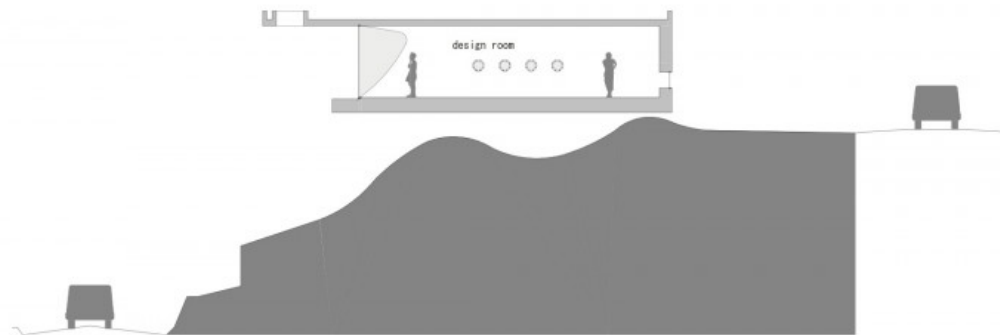
SEISMIC RESISTANT BUILDING  
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# Mountains & Opening House

scale=1:200



AA section



BB section

<http://www.archdaily.com/68593/mountains-opening-house-eastern-design-office/>

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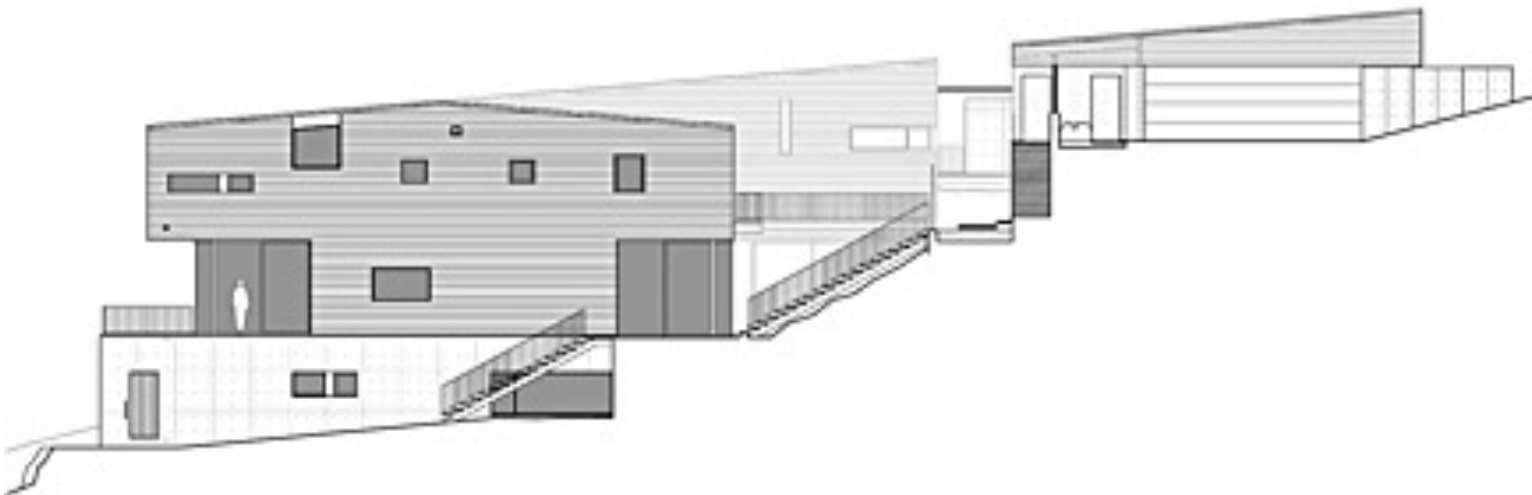
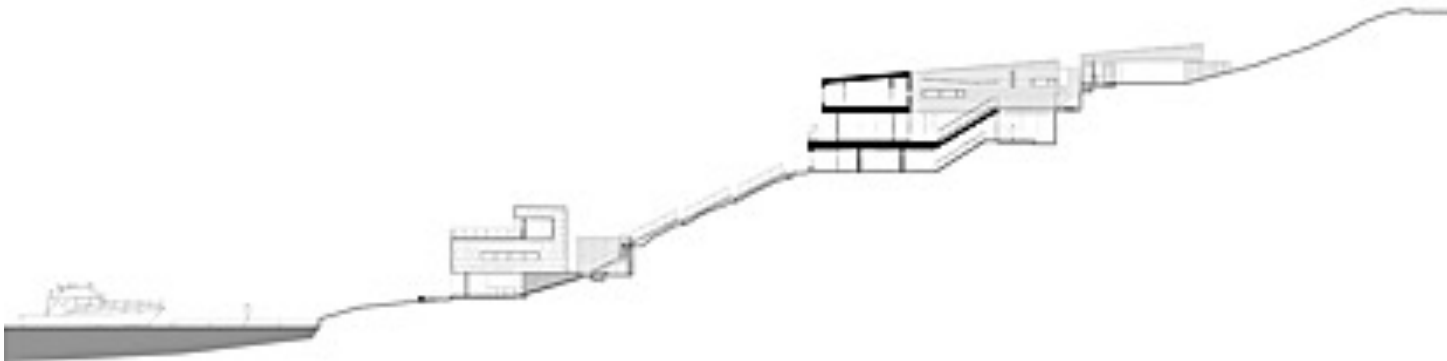
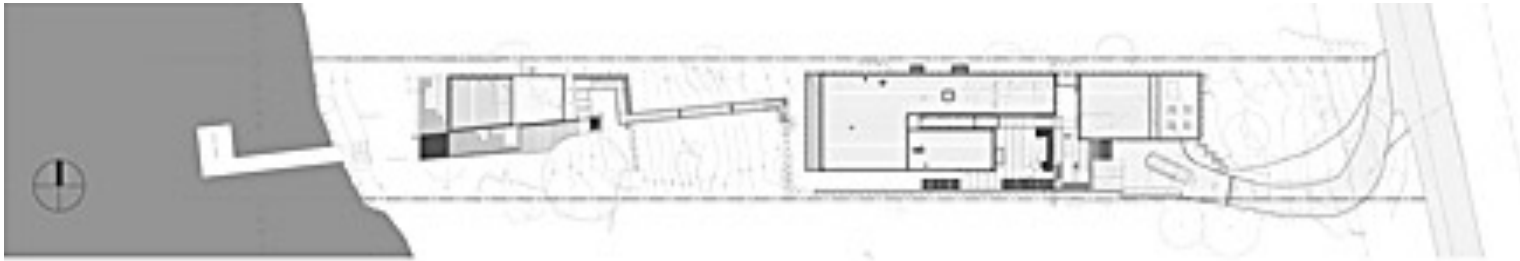
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1

OUTLINE

**BUILDING  
SYSTEMS**

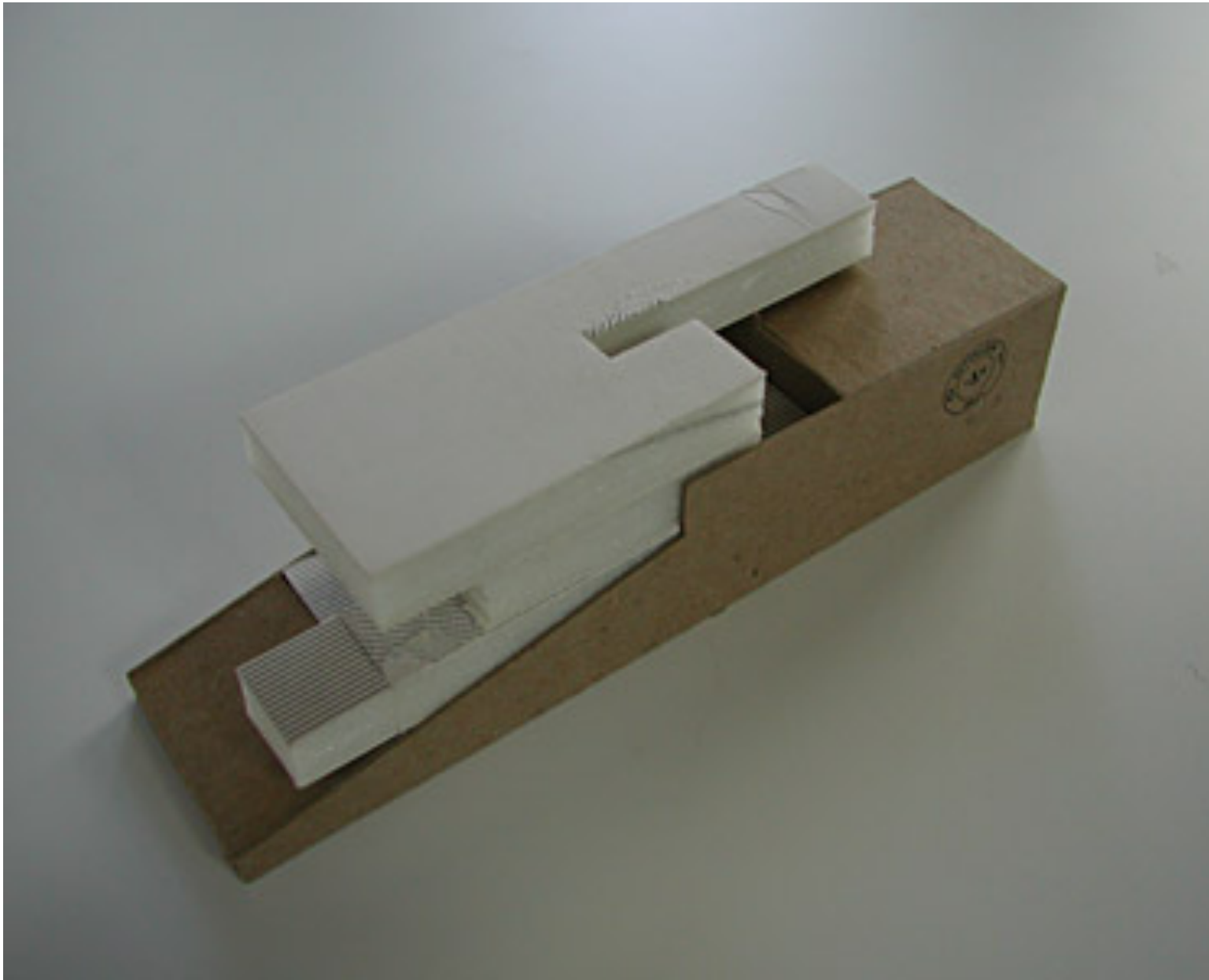
Basic concept  
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2

**SEISMIC  
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