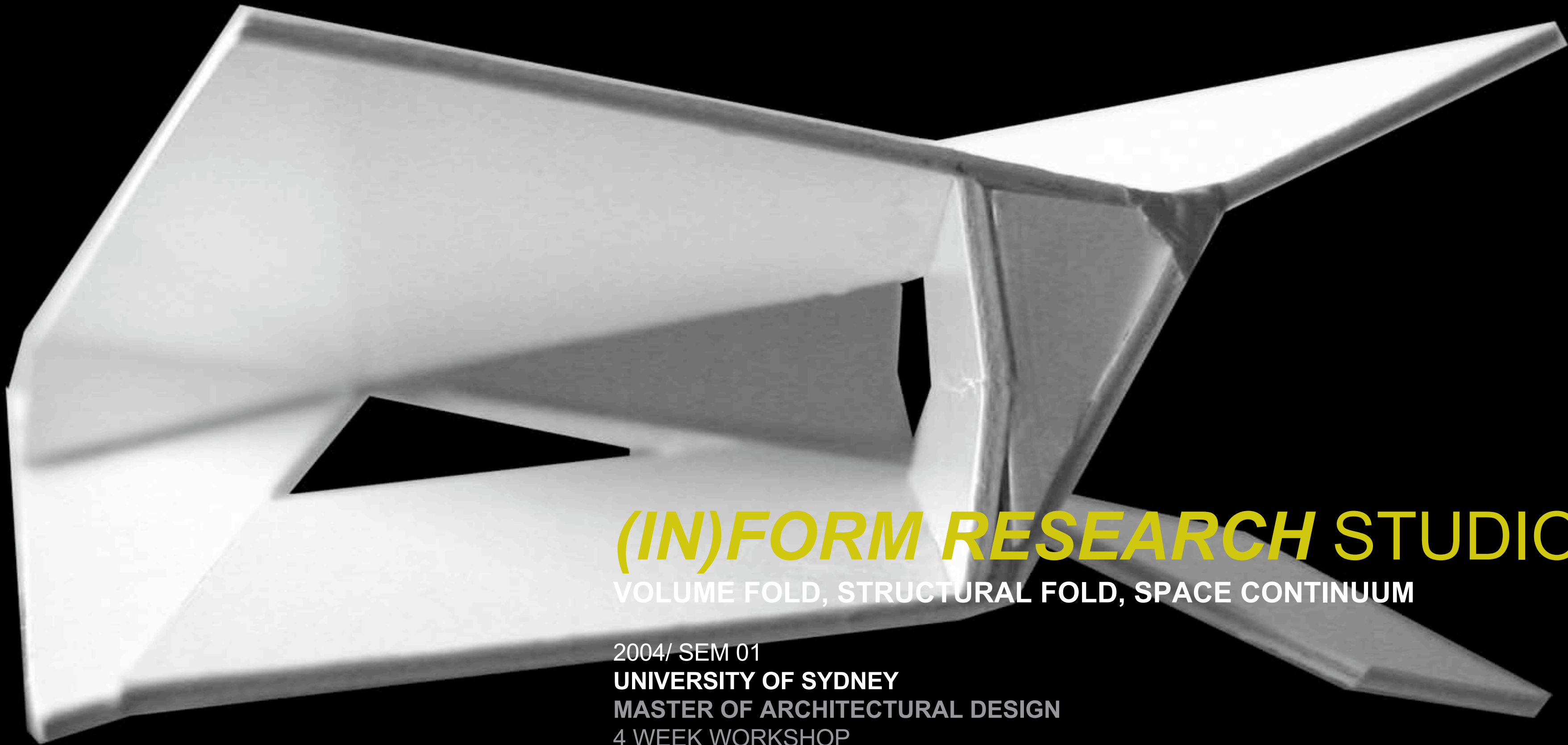
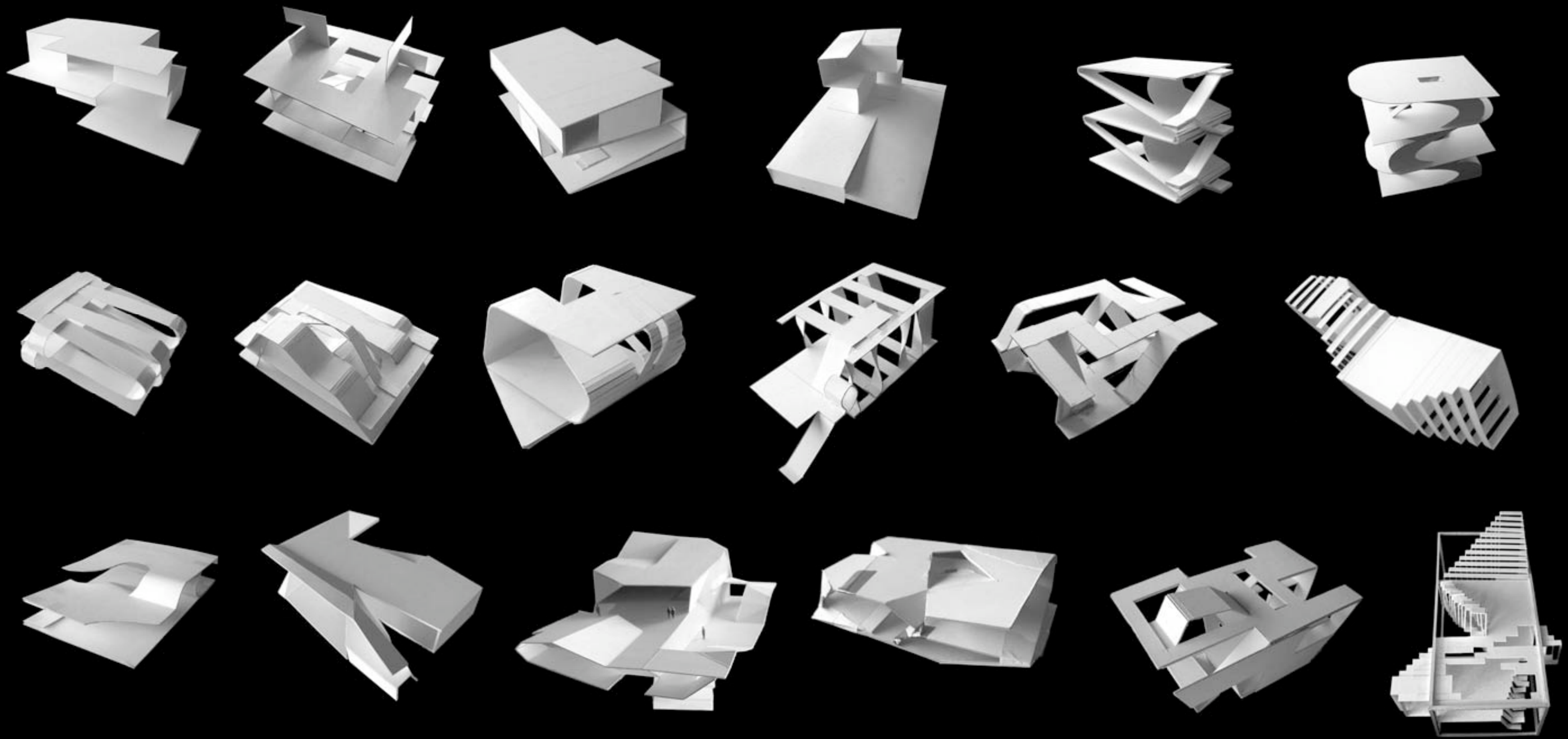


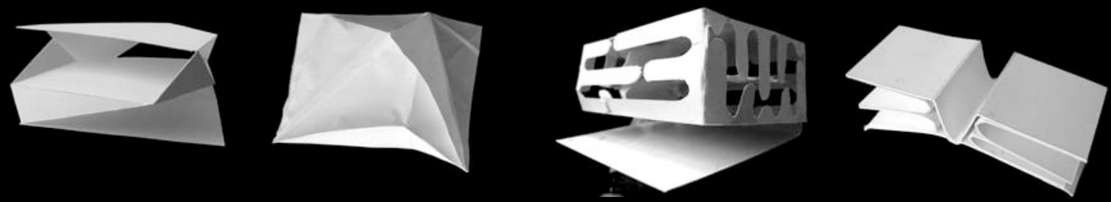
(IN)FORM RESEARCH STUDIO

VOLUME FOLD, STRUCTURAL FOLD, SPACE CONTINUUM

2004/ SEM 01
UNIVERSITY OF SYDNEY
MASTER OF ARCHITECTURAL DESIGN
4 WEEK WORKSHOP

STUDIO LEADER/ **DAGMAR REINHARDT**
YEAR COORDINATOR/ PROF. TOM HENEGHAN





PARTICIPANTS
BH/ Baerholm, Hans (Denmark)
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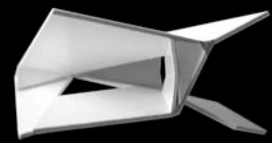
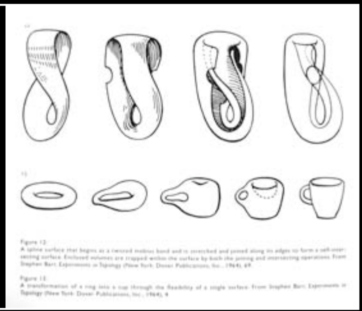
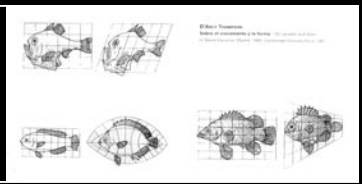
DJ/ Duenas Estrada, Javier (Mexico)
HR/ Haggis, Robert (USA)
HH/ Hoang, Hai Anh (Vietnam)
HL/ Huo, Li (China)
BD/ Jaime Beltran, Diego (Columbia)
NP/ Nanda, Parul (India)
NK/ Nguyen Ngoc, Kim (France)
RS/ Rajendiran, Sathiya (India)
SR/ Sane, Rama (India)
GS/ Ghosh, Soumajeet (India)
SD/ Suarez, Diana (Columbia)
VD/ Valenza, Dario (Italy)



X Y Z h = m$^{2?}$



BARR, EXPERIMENTS ON TOPOLOGY



D‘ARCY THOMPSON, ON GROWTH AND FORM

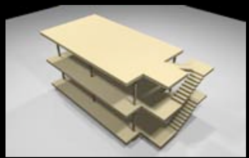
ON
(IN)FORM RESEARCH STUDIO

From follows function. Form is design. Form is beauty. What is form? Under which restrictions is form generated? Do we still need the grid? What happens when other than numerical restrictions define the space, such as information systems? What happens to form within a system of overlapping activities at the intersection of work/ domestic life?

Throughout the development of architectonics, the production of form has been based on the contemporary understanding of geometry. At the same time, the perception of space as determined by the techniques of visualisation and its mathematics of construction depicted in each epoch’s art/ culture had a strong influence on exactly this geometry – a predetermination of space perception through the training of the eye and shaped the information presented. The cultural shift from the central perspective to photography to film has found its equivalent of form understanding in each epoch’s geometry, integrating time as a relevant additional condition to the original x-y-z axis, thus leaving the metrical space.

The **(IN)FORMRESEARCH STUDIO** will review these phenomena of ‘geometry history’ –from Palladian symmetry via the Cartesian grid to the Corbusian Plan Libre – to investigate alternative forms of geometry:

With the integration of time as a 4-dimensional factor and the acknowledgement of parallel realities as offered by digital information systems, a series of form generating methods have emerged. The Anamorphical Plan, Growth and Form Interdependencies as described by D’Arcy Thompson, the Fluctuating Plan, grid-independent geometries such as the Moebius Strip and the Klein Bottle, and Form-generating processes such as surface bifurcations systems, combined geometry strategies and multiples organization patterns are to name but a few.



LE CORBUSIER
DOMINO HOUSE

***INFORM* RESEARCH STUDIO**
UNITS OF APPROACH

U1 CONTEMPORARY ARCH GEOMETRIES
U2 DEVELOPMENT OF
SURFACE STRATEGIES/ RULES
U3 ADAPTION TO PROGRAM

U4 ARCH PROPOSAL

STRATEGIES

The way in which the **(IN)FORMRESEARCH STUDIO** will engage in form definition and form generating processes is relatively simple: We will construct, reconstruct and transform a series of models, which build up the body of studio research, based on an abstract incorporation of the modernist fever/ Le Cruiser's Domino House. The five points, which generated the original design, will be the points of departure to this exercise: for a hyperstrenghened, deformed, re-installed, adapted, morphed, varied or abandoned solution of a surface.

The production of a large number of physical models (and 3D computational equivalents) will start with a generative with shared characteristics (same material/ various forms) and lead to a moment when the material aspects will condition the result. In respect to the short time given, you will be asked to team up in 4 groups as a joined work force, researching under one headline, but with individual responsibility. Each group will start from one set of rules, and each of its member's will develop his/her own deviation from the original setup, thus exploring an alternate result through subtle change of parameters. In numbers: each one of you will have produced approx. 5-10 models by the end, both rules and models will be documented as a process and presented as team result. Each step will be discussed in the studio, and ideally the whole studio should profit from one single person's product.

CHOICE OF HEADLINE:

Among a variety of geometrical approaches such as Box Deformation, Surface Bifurcation, Combined Geometries/ Spline/ Box and Multiple Organisations/3D Patterning/Space Nodes, the (IN)FORMRESEARCH STUDIO has decided to work with the FOLD and its varieties, ranging from Multiple Pattern Triangulation to the Structural Fold.

ORTHOGONAL VOLUME FOLD
1- SURFACE/ OPPOSING

REGULAR TRIANGULATION
TRIANGULATED VOLUME FOLD
MULTIPLE PATTERN

CURVED SURFACE
2 SURFACES CONTINUUM/ HORIZONTAL

PATTERN FOLD
DISTORTED RECTANGLE REPETITION

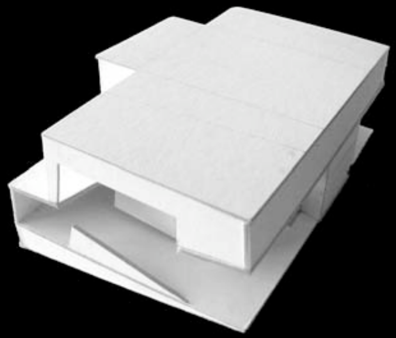
ORTHOGONAL SURFACE FOLD/ TWIST
FORM VS VOLUME

MULTIPLE BEND/ RIBBON
FORM VS VOLUME

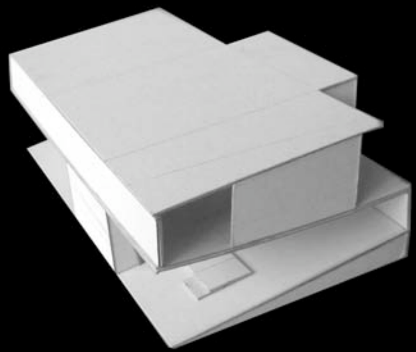
BEND SURFACE
2 SURFACES COUNTERACTING

PARTIAL VOLUME FOLD
SURFACE STRIATION

STRUCTURAL FOLD
SURFACE BEND FORCES



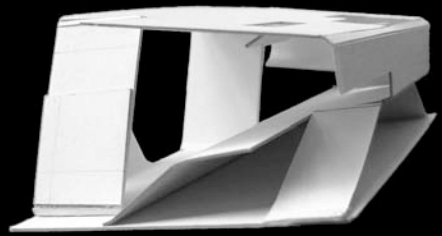
RS- A 1.1
ENCLOSED SURFACE



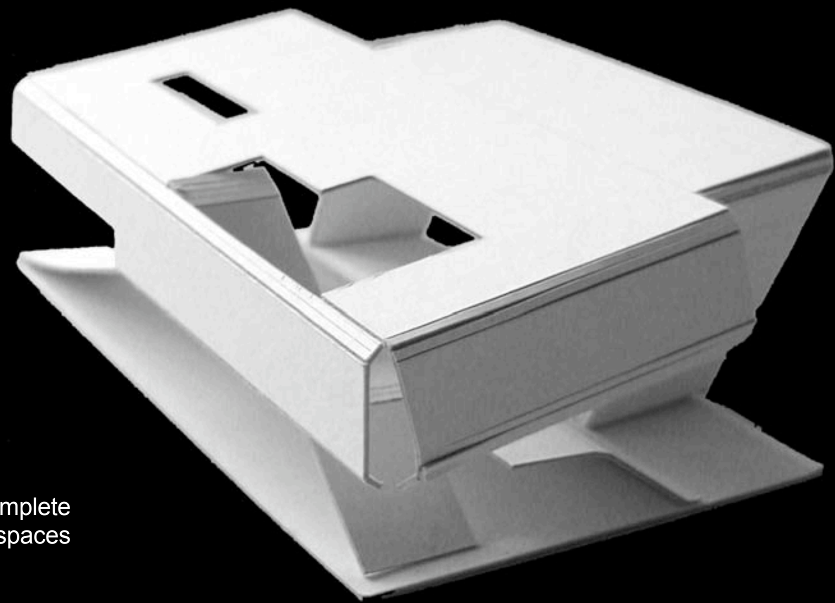
RS- A 1.2

RS- B 1.1
1 FOLDED SURFACE

RS- B 1.2

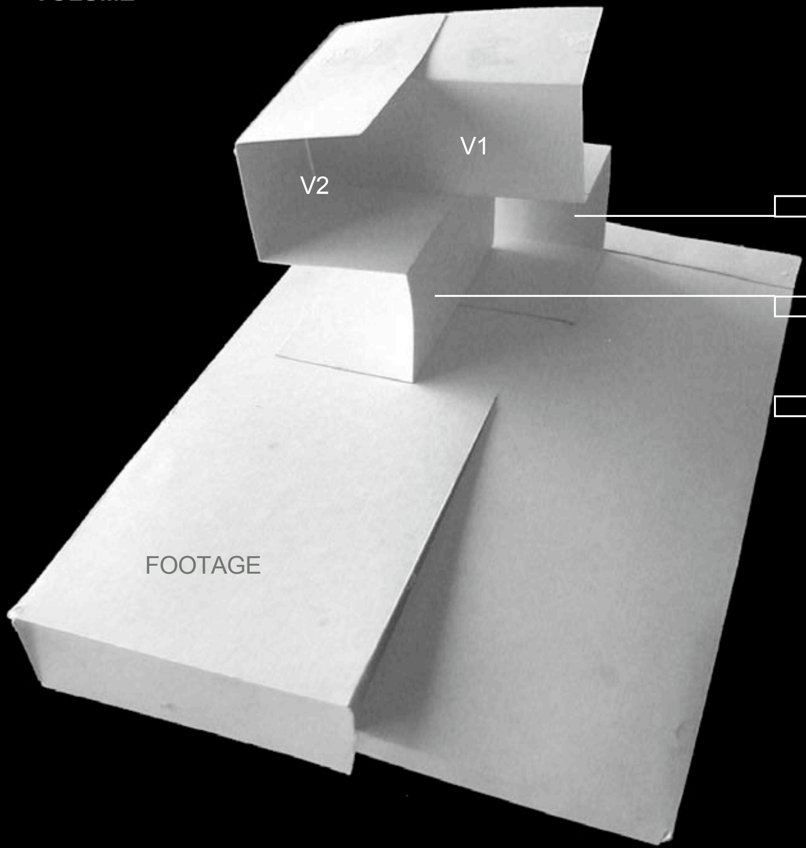


> one surface generates the complete
envelope, including circulation spaces

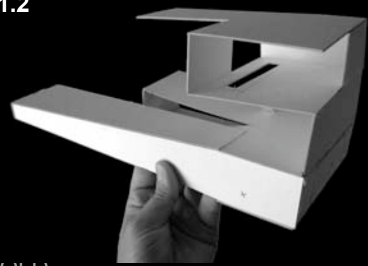


RS- B 1.3

SR C 1.1
VOLUME



SR B 1.2



1 ABSTRACTED FOLD
0 working plane> 12 x 18

1 surface is an abstraction/ extension of surrounding plane
2 surface is bifurcated into 2 non-similar strands

3 strands are folded to form 2 volumes on 3 levels (footage, level1, level2)

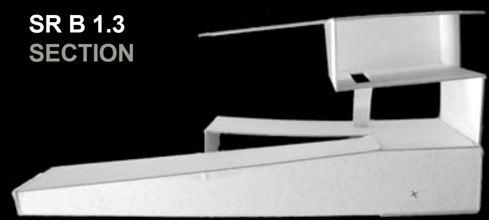
4 resulting volumes are positioned in opposing directions

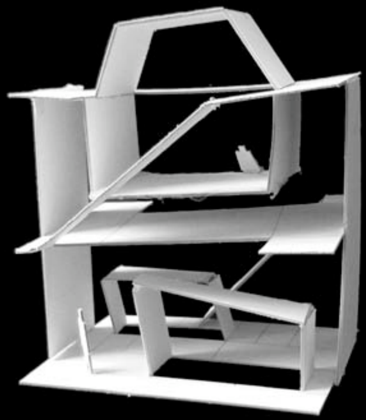
SR C 1.1

> resulting volumes are positioned in opposing directions

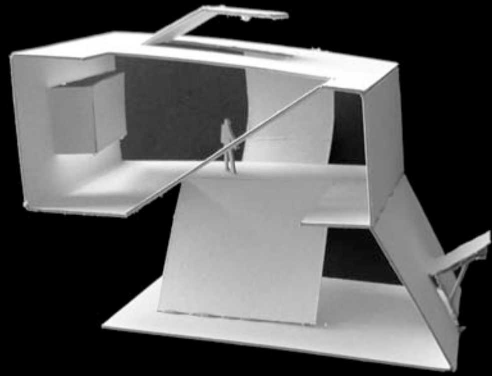
ORTHOGONAL VOLUME FOLD 2
1-3 SURFACE/ OPPOSING/ OPERATING

SR B 1.3
SECTION



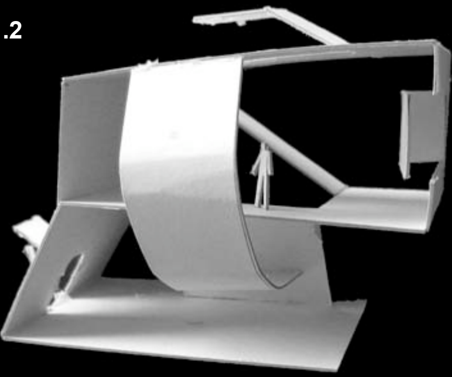


NK- A 1.1
HOUSE IN HOUSE



NK- B 1.1
TWISTED HOLD

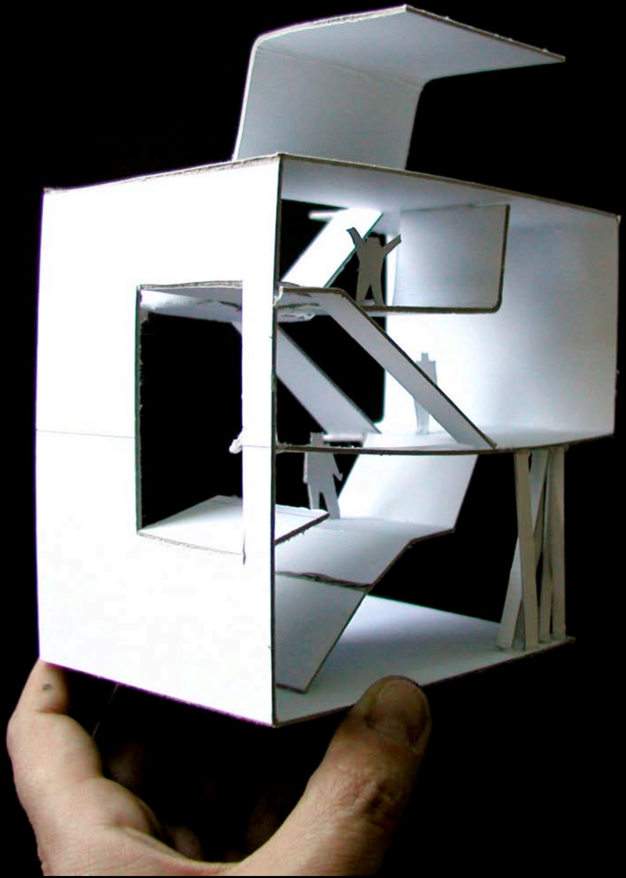
NK- B 1.2



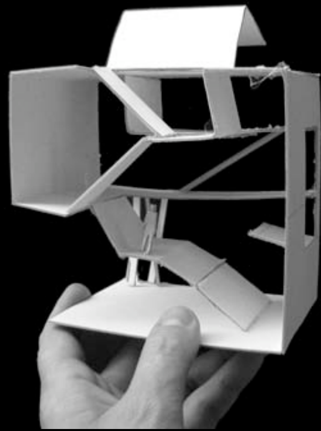
STRUCTURAL FOLD PLUS
SORTS OF HOLD

NK- C 1.1
DIAGONAL HOLD

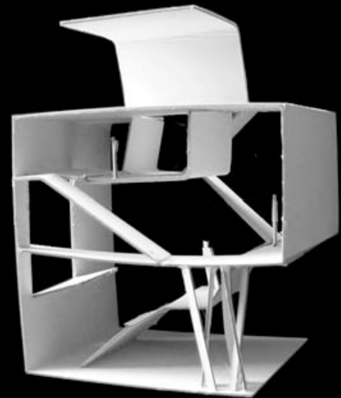
NK- C 1.2



NK- D 1.1
DISGUISED HOLD

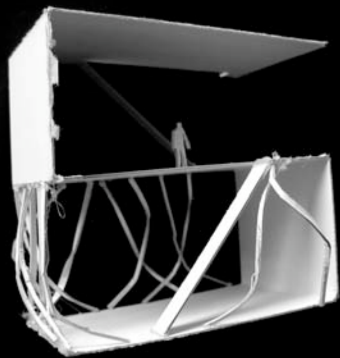


NK- D 1.2



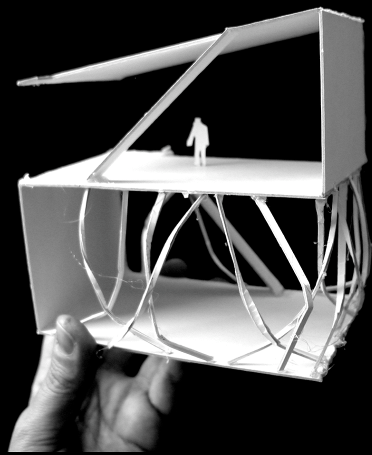
NK- D 1.3

STRUCTURAL FOLD PLUS
SURFACE HOLD

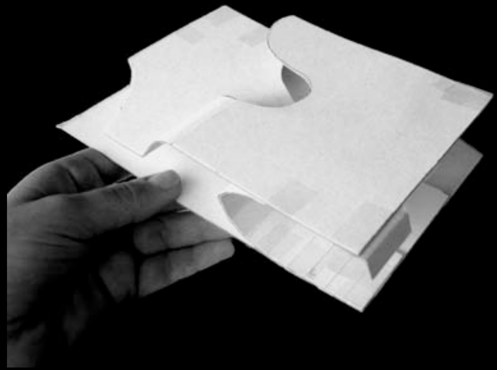


NK- E 1.1
DISGUISED HOLD 2

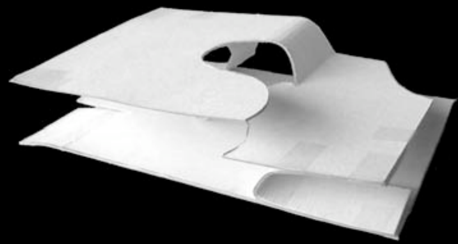
NK- E 1.2



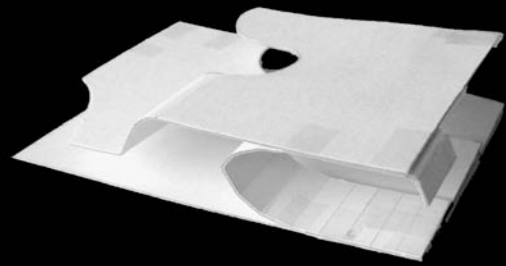
GS- B 1.1
CONTINUITY



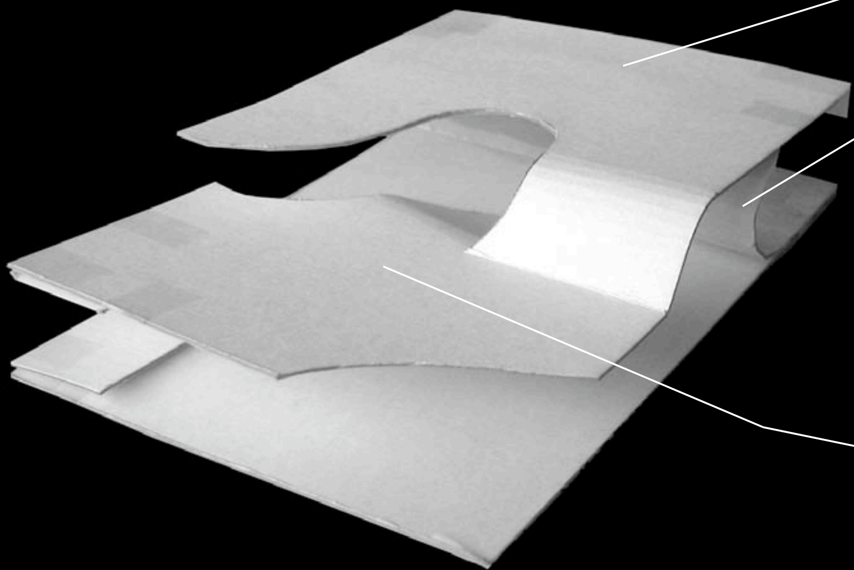
GS- B 1.2



GS- B 1.3



CURVED SURFACE
2 SURFACES CONTINUUM/ HORIZONTAL



1 CURVED FOLD
0 working plane = 12 x 18

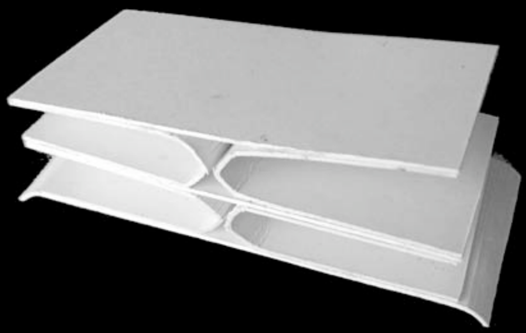
1 first surface is cut according to implied curvature plus extension

2 second surface is cut according to implied curvature
3 both of them form 1 continuos plane on 2 levels

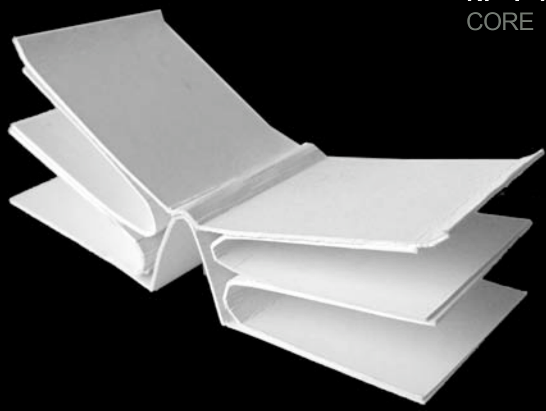
4 integration of 3rd plane to form one uninterrupted space floating between 2 levels/ splicing to form wall fractions

SYD04/01

NP-E 1
CORD

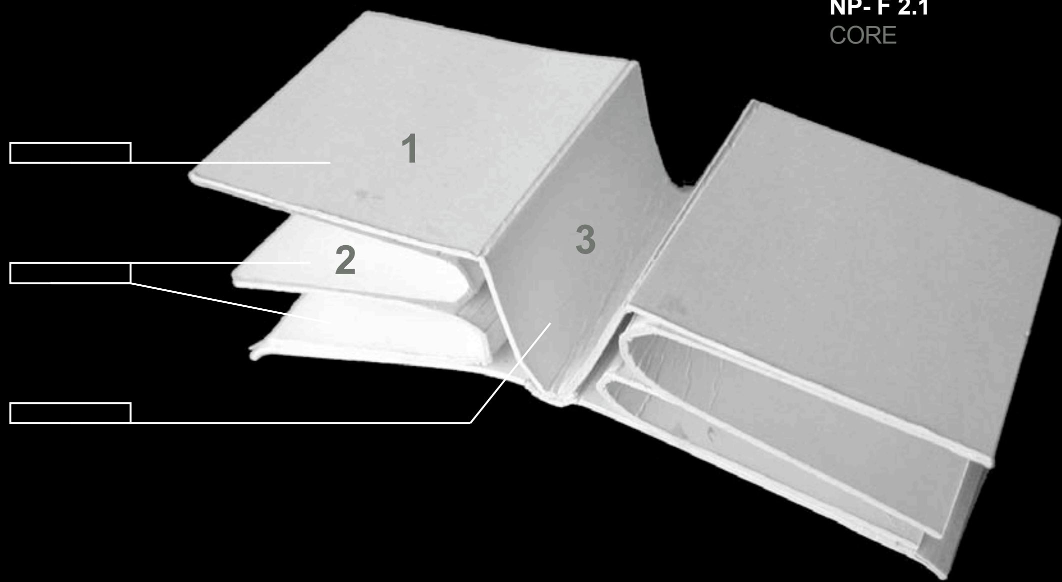


NP- F 1.1
CORE



STRUCTURAL FOLD 3
SURFACE COMBINED FORCES

NP- F 2.1
CORE



0 working plane>/= 12 x 18

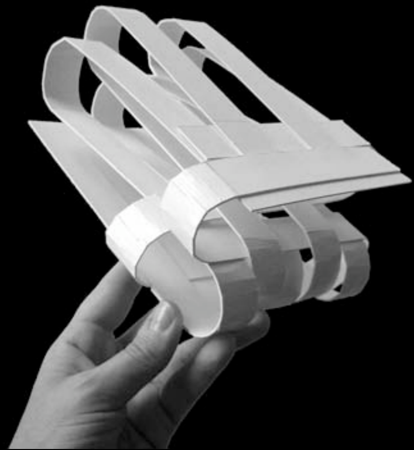
1 main surface is bend to form a linear/ multiple beam

2 in addition, two secondary planes are combined with a to form an internal/ structural core plus adjunct levels

3 the gap/ void formed by core works as spatial potential which can inform the surrounding open floor plan

4 main facades show non-connective pattern to demonstrate the non-loadbearing character

NP- D 1.1
MULTIPLE RIBBON



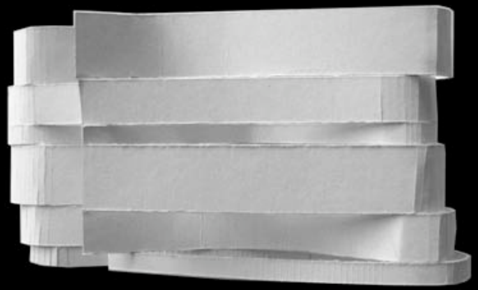
NP- D 1.3
MULTIPLE RIBBON

NP- C 1.1
COLUMN/SURFACE

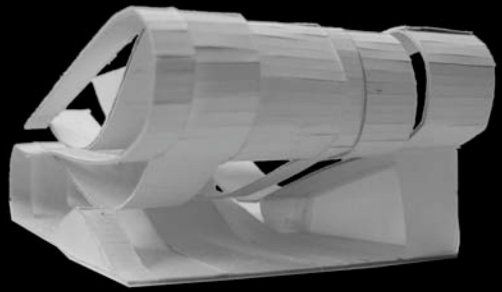
NP- C 1.2
COLUMN/SURFACE

STRUCTURAL FOLD 2
SURFACE BEND FORCES

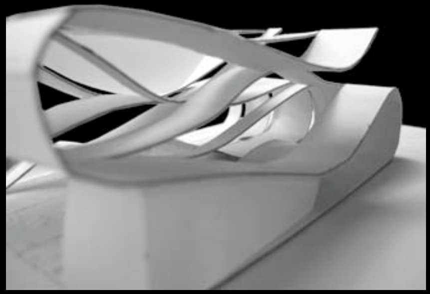
> surface as self-inflicted structural device:
1 piece folded back to carry the total



HL- B 1.1
SURF SPLIT/ RIBBON

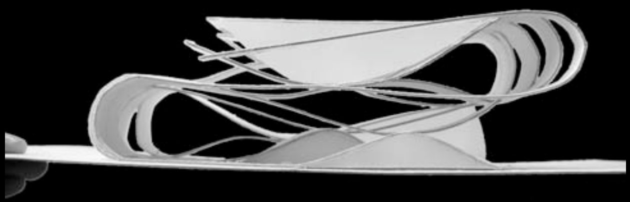


HL- B 1.2



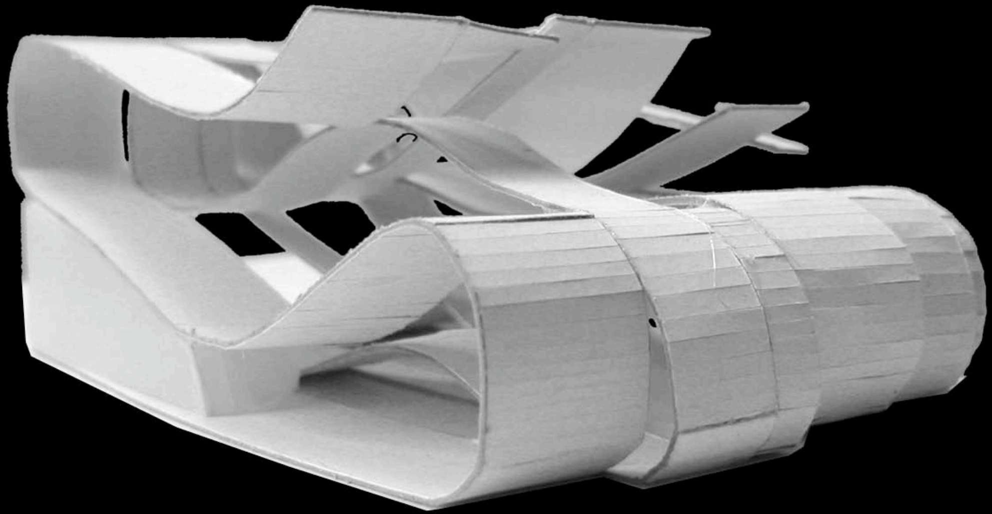
HL- B 1.3

> multiple ribbon organisation forming
spatial pockets/ continuous fluidity

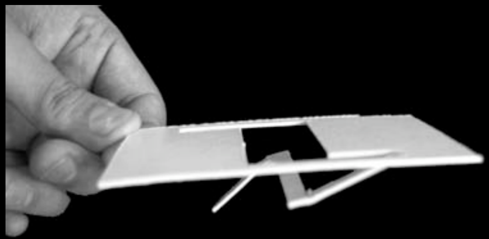


HL- B 1.1
SECTION

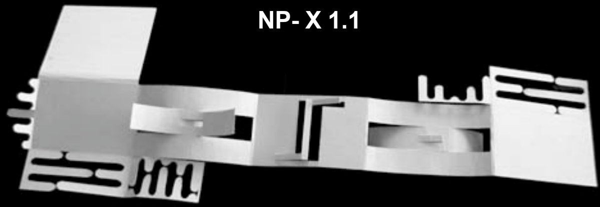
GALLERY SPACE
(continuous path/exhibit: video projections)



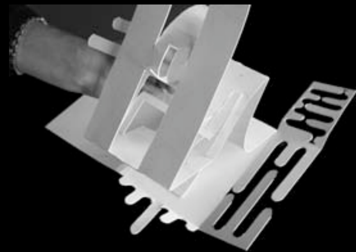
HL- B 1.4



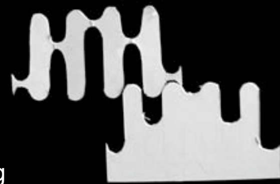
NP- J 1.1
SURFACE SPLIT



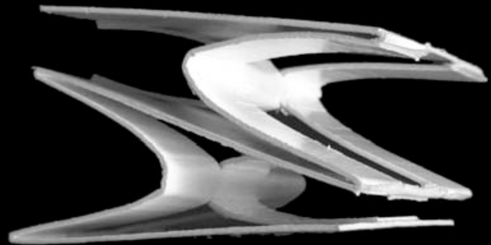
NP- X 1.1



>2 main surface is bend to form the slabs, structural fold, fassade and footage

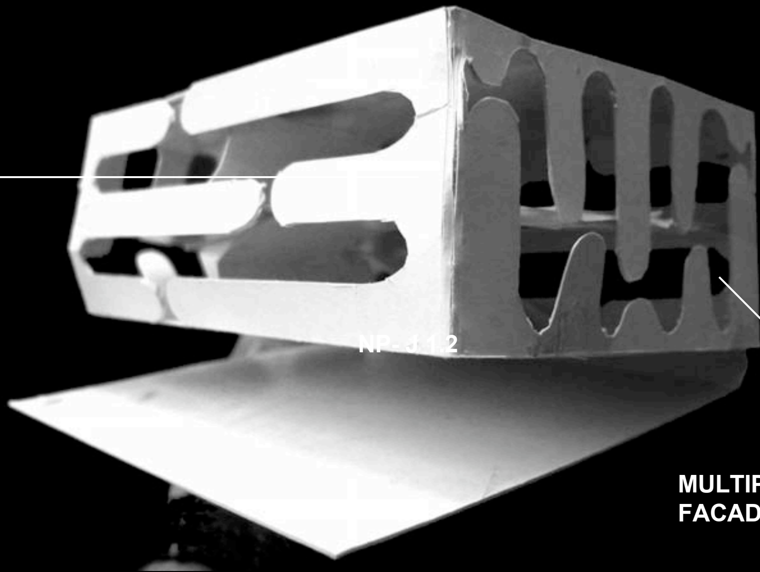


>4 main fassade show non-connective pattern to demonstrate the non-loadbearing character



NP- I 1.1
BIFURCATION

STRUCTURAL/
CIRCULATION CORE



NP- G 1.1
VOLUME

>3 the surface bifurcation/void formed works as a circulation core

MULTIPLE-NON-LOAD
FACADE PATTERN

STRUCTURAL FOLD 3
SURFACE COMBINED FORCES

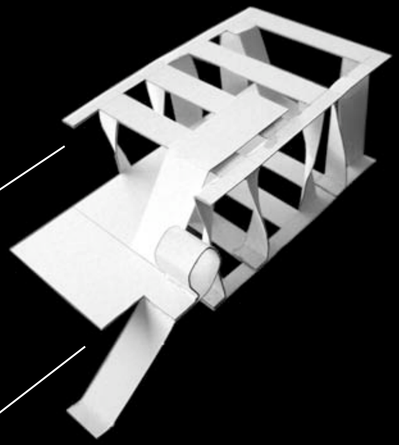
PARTIAL VOLUME FOLD
SURFACE STRIPS BEND

1 SURFACE FOLD/ TWIST
0 working plane = 12 x 18

1 three surface cut into an equal stripe pattern

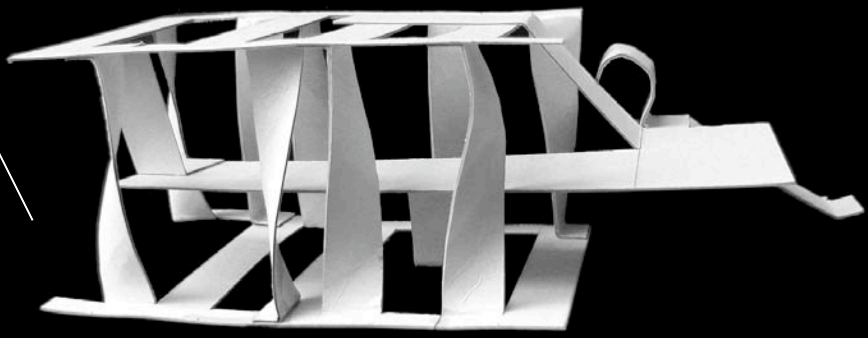
2 of each surface, half of the material (stripes) is folded to meet the next one, direction of fold: orthogonal system

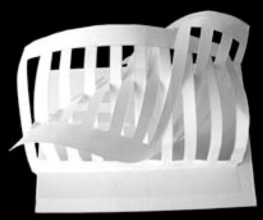
3 two of the surfaces form 2 exterior facades: at this point, the folding down/up is orthogonal, but refined with a twist applied, direction: chance system.



VD- A 1.1
DOUBLE FOLD

VD- A 1.2
TWIST FACADE





VD- B 1.2
3D-SURFACE/ VOL

PARTIAL VOLUME FOLD
SURFACE STRIPS BEND

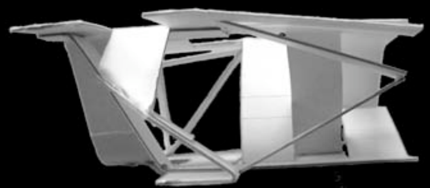
1 SURFACE FOLD/ TWIST
0 working plane = 12 x 18

1 three surface cut into an equal stripe pattern

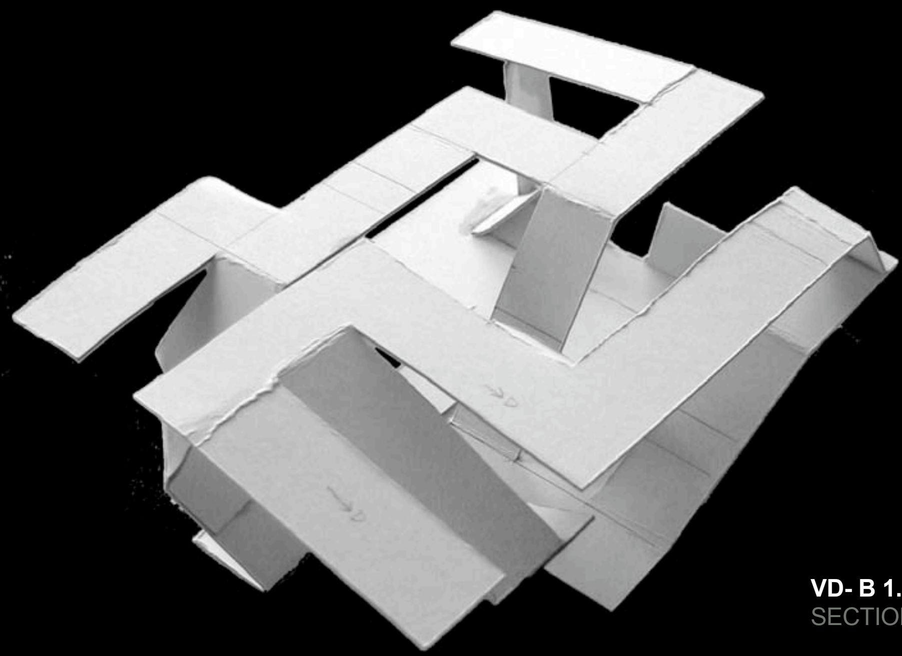
2 of each surface, half of the material (stripes) is folded to meet the next one, direction of fold: orthogonal system

3 two of the surfaces form 2 exterior facades: at this point, the folding down/up is orthogonal, but refined with a twist applied, direction: chance system.

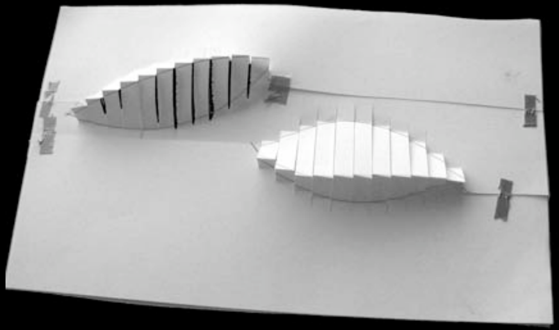
VD- B 1.1
LEVELS



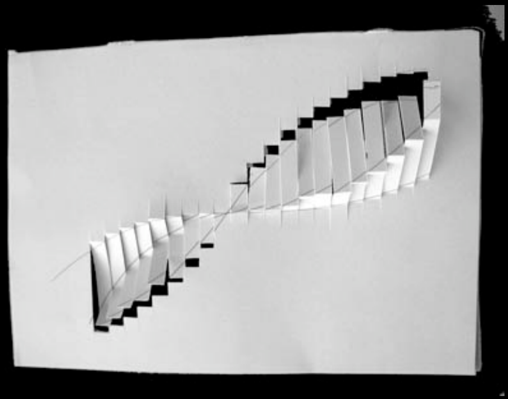
VD- B 1.1
SECTION



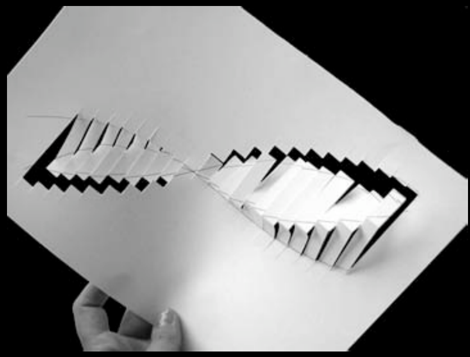
VD- B 1.1
SECTION



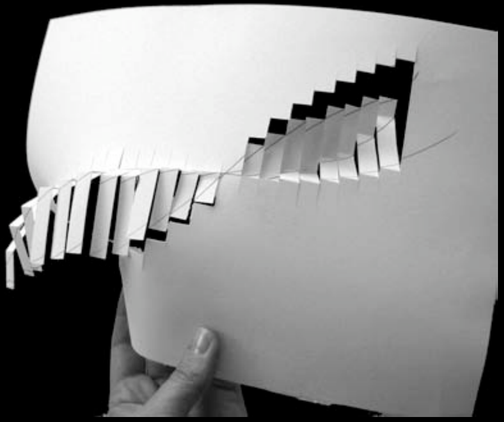
BH- D 1.1
VOLUME



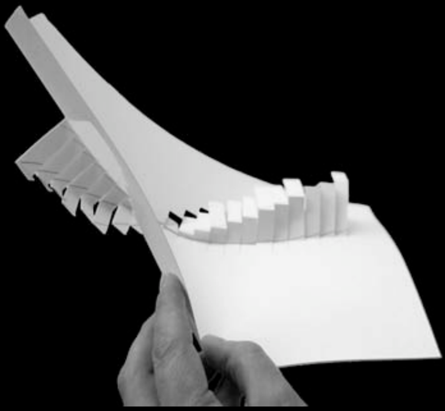
BH- C 1.1
SURFACE DIVISION



BH- C 1.2



BH- C 1.3



BH- C 1.4

PARTIAL VOLUME FOLD
SURFACE STRIPS BEND

> stripes are bend into 2 directions to form one volume/
blurr distinctions between horizontal/ vertical

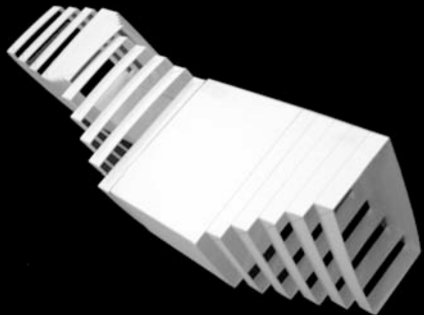
BH- B 1.1
VOLUME STRIATED

BH- B 1.2
1 LEVEL

1 PARTIAL VOLUME FOLD
0 working plane> 12 x 18

1 surface is striated

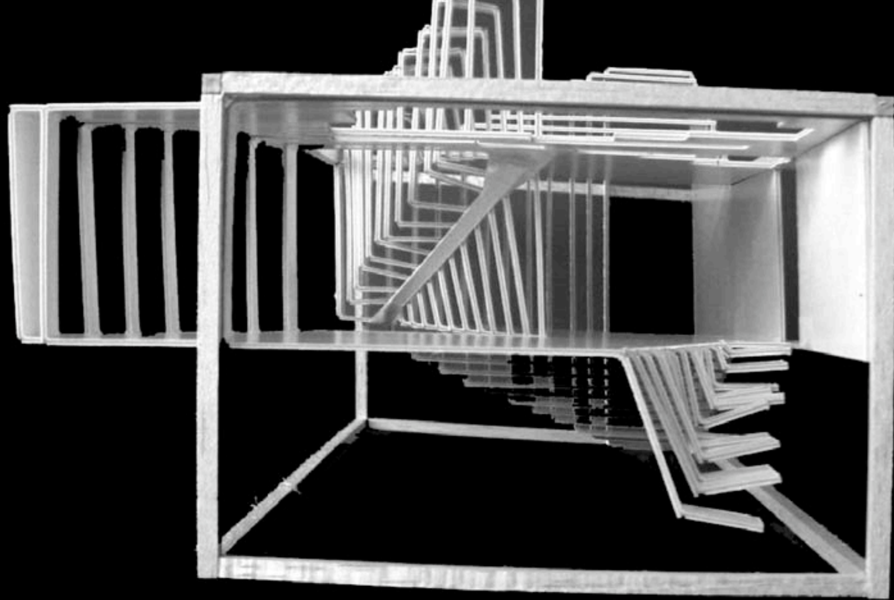
2 stripes are bend into 2 directions to form one volume/ blurr distinctions between wall/ floor



BH- C 1.1
3D LEVEL 2

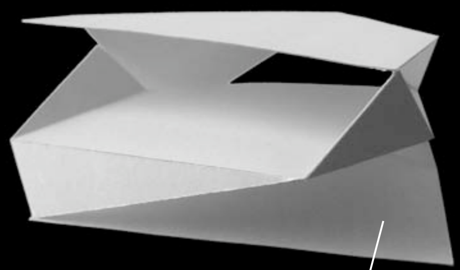
BH- E 1.2

PARTIAL VOLUME FOLD
SURFACE STRIPS BEND

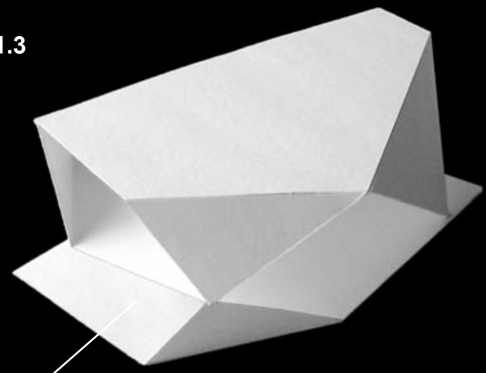


BH- E 1.3
GARDEN

CZ - **A 1.1**
DIFFERENT
TRIANGULATION

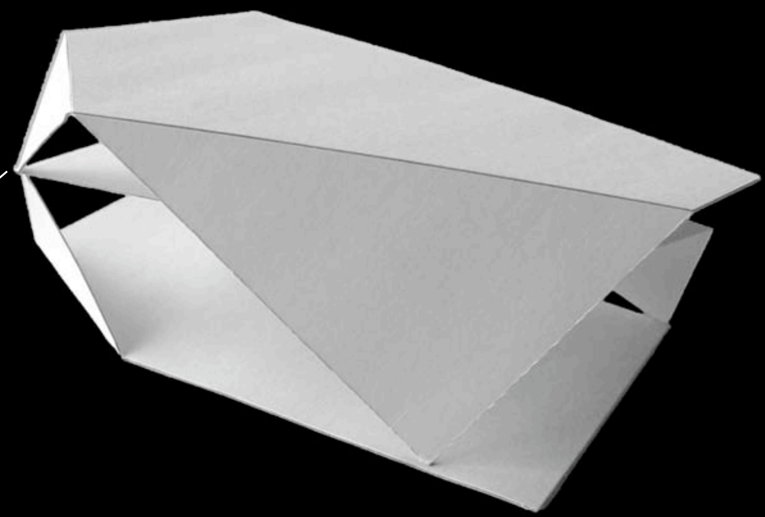


CZ - **A 1.3**



TRIANGULATED FOLD
SURFACE IN TRIANGLE

CZ - **A 1.2**



1 TRIANGULATED FOLD
0 working plane = 12 x 18

1 surface folded in triangulation

2 three interdependent planes within a triangular fold system, in hierarchy: first plane folded 1 edge/ 1 time, second two times, third three time

3 assembled: all downfold meet in (corner) points, no folded point is allowed to be placed within a surface

4 load-bearing spans planes, meets in 1 concentration point

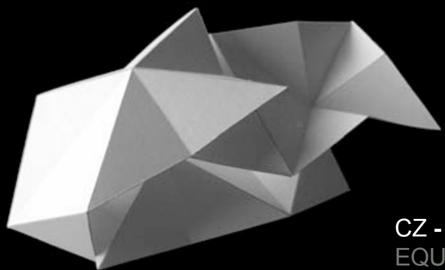
CZ - **C 1.1**
VOLUMETRIC TRIANGLE

CZ - **C 1.2**

CZ - **C 1.3**

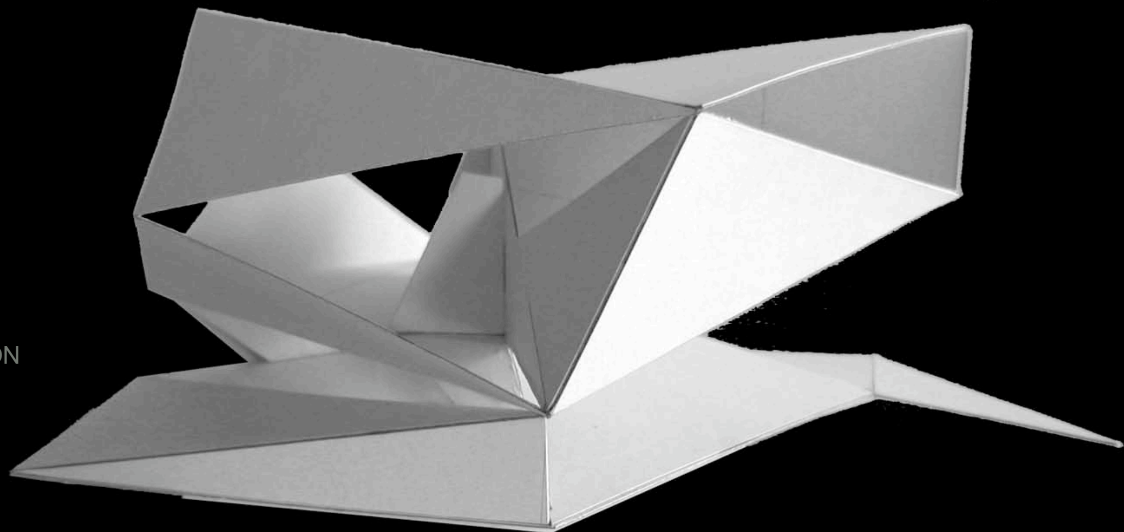
> one surface folded in triangulation
to form 1 continuous volume

CZ - **D 1.1**
EQUAL
TRIANGULATION



CZ - **B 1.1**
EQUAL
TRIANGULATION

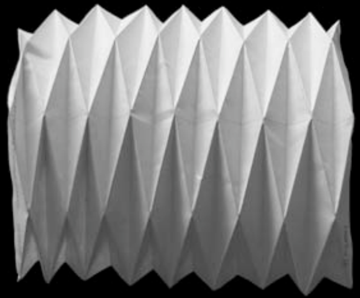
➢3 surface folded in triangulation/
in the same way and arranged



TRIANGULATED VOLUME FOLD
SURFACE IN TRIANGLE/ 3D ENCLOSURE

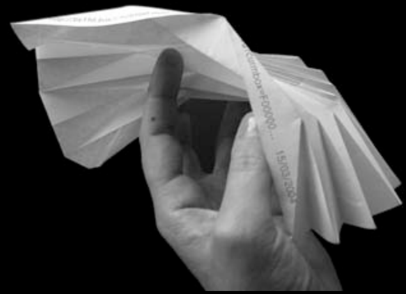
SYD04/01 ***(IN)FORM****RESEARCH*

HB- A 1.1
PATTERN



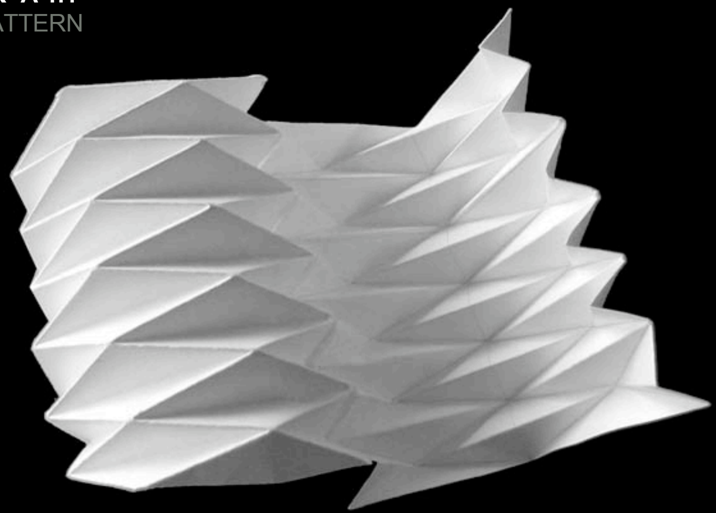
HB- A 1.1
FOLD DEFORMED

HB- A 1.1
DEFORMED 2



PATTERN FOLD
DISTORTED RECTANGLE REPETITION

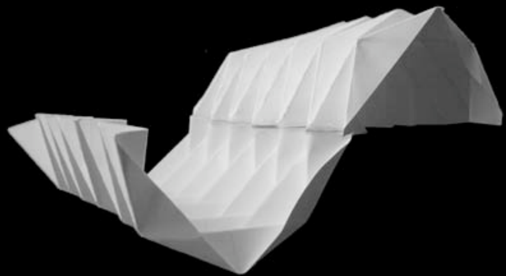
NK- A 1.1
PATTERN



NK- AB 1.1
PATTERN COUNTERPOINT

>1 complete plane is folded into triangular devisions

NK- C 1.1
PATTERN COUNTERPOINT



NK- F 1.1
MULTIPLE PATTERN FOLD

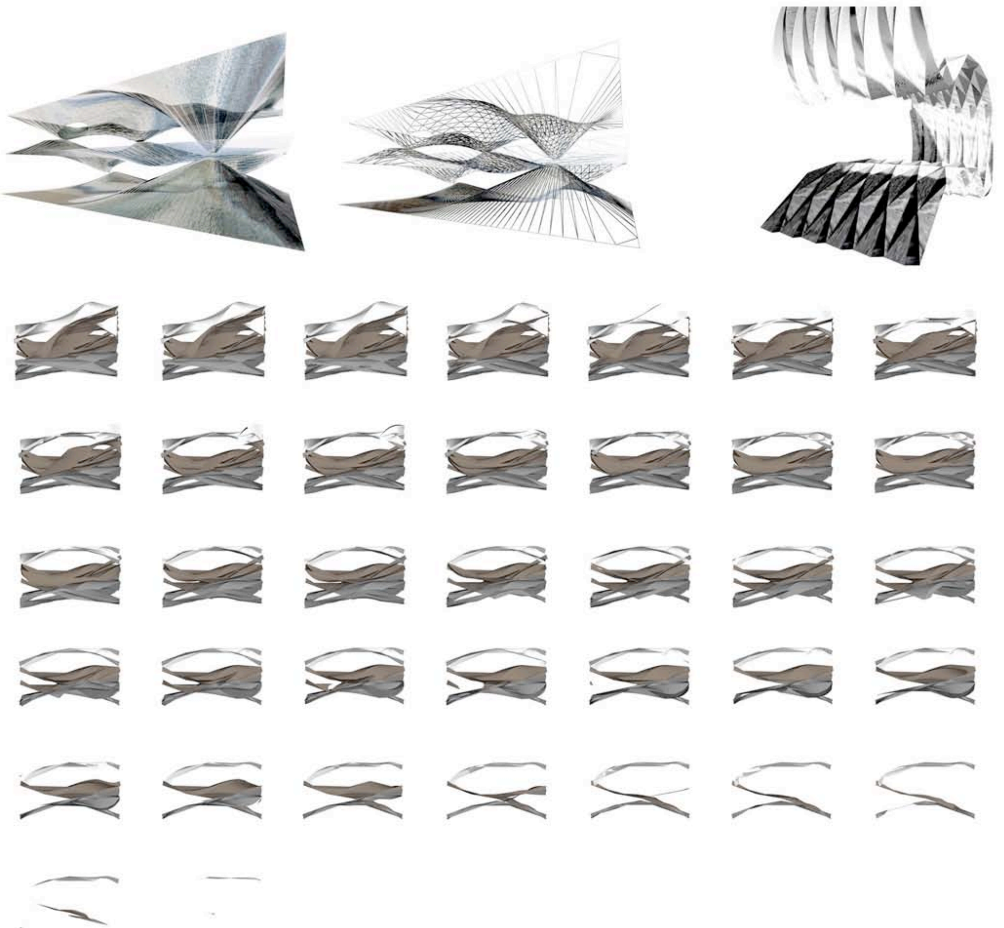
NK- F 1.2

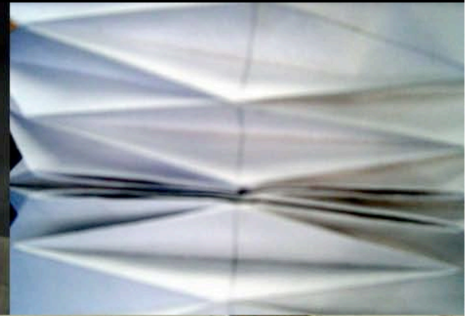
Level 1

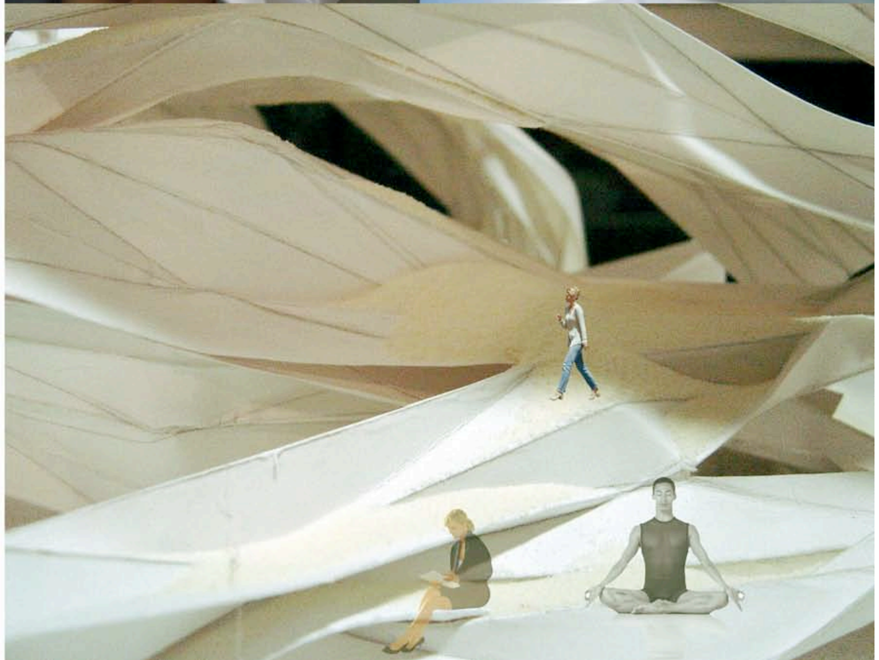
Level 2

NK- F 1.3/ Interior

PATTERN FOLD
DISTORTED PATTERN FOLD



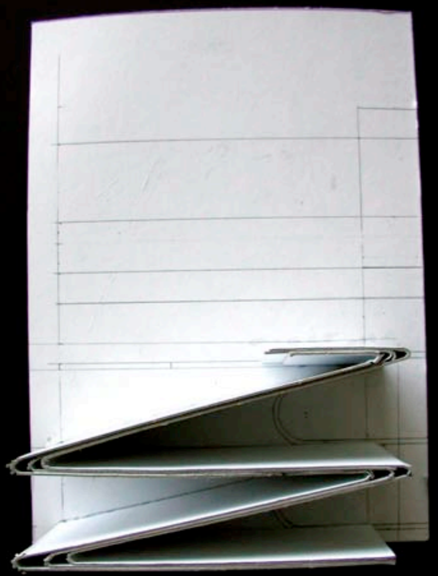




DESIGN UNIT:

U4 DESIGN PROPOSAL

KIM NGYEN NGOC (FRANCE)

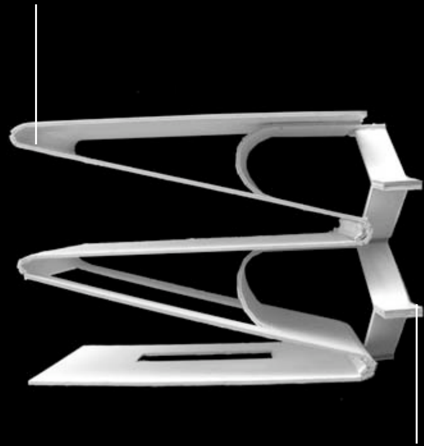


HR A 1.1
SYSTEM

> main surface is bend to form the slabs, structural fold, facade and footage; using decreasing mass

HR B 1.1
TOP

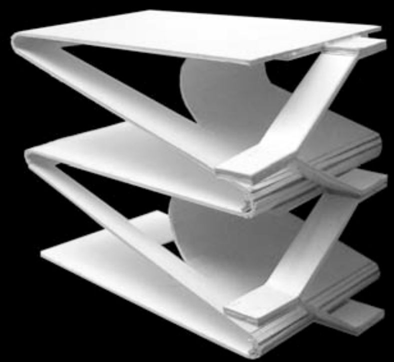
> moving up



> pull down

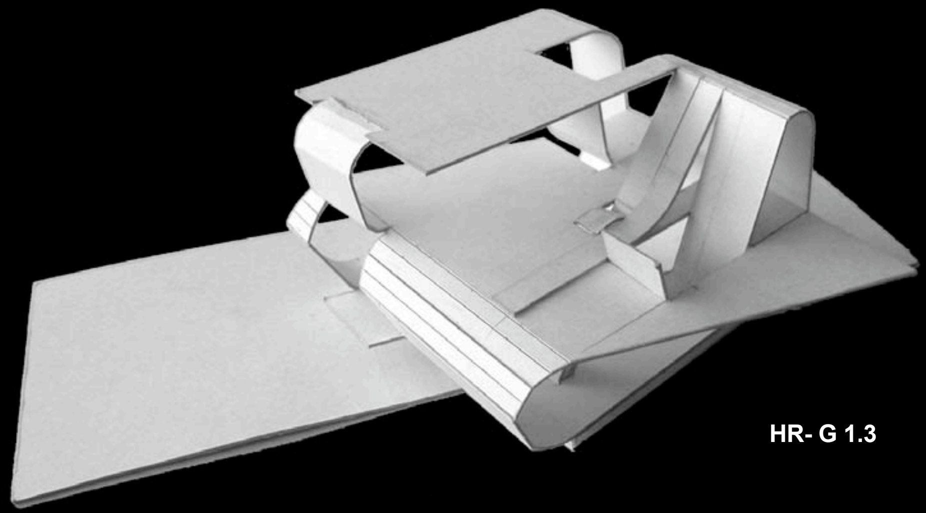
HR B 1.2
SECTION

> steel staircase structure acts as a backpull to spring (3 levels): draws forces back to ground

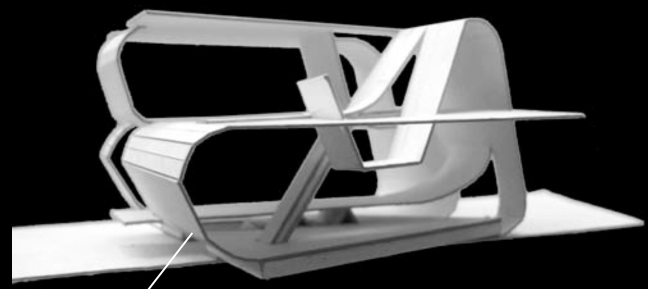


HR B 1.3
FRONT

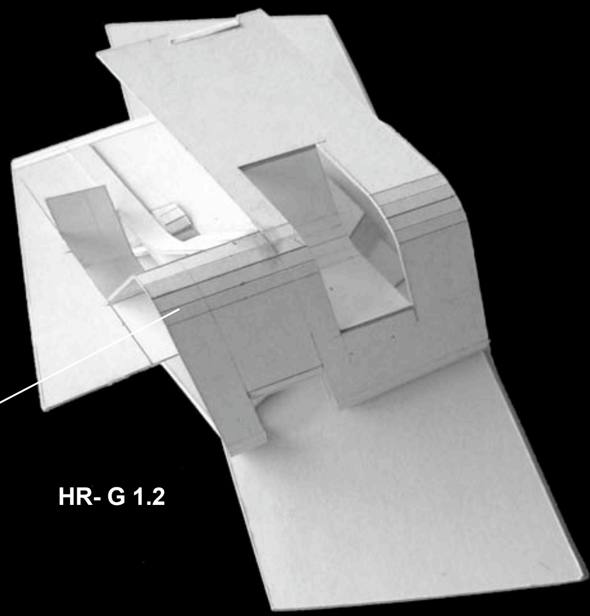
STRUCTURAL FOLD 1
SURFACE BEND FORCES



HR- G 1.3



HR- G 1.1
EQUAL
TRIANGULATION



HR- G 1.2

1 BEND SURFACE
0 working plane> 12 x 18

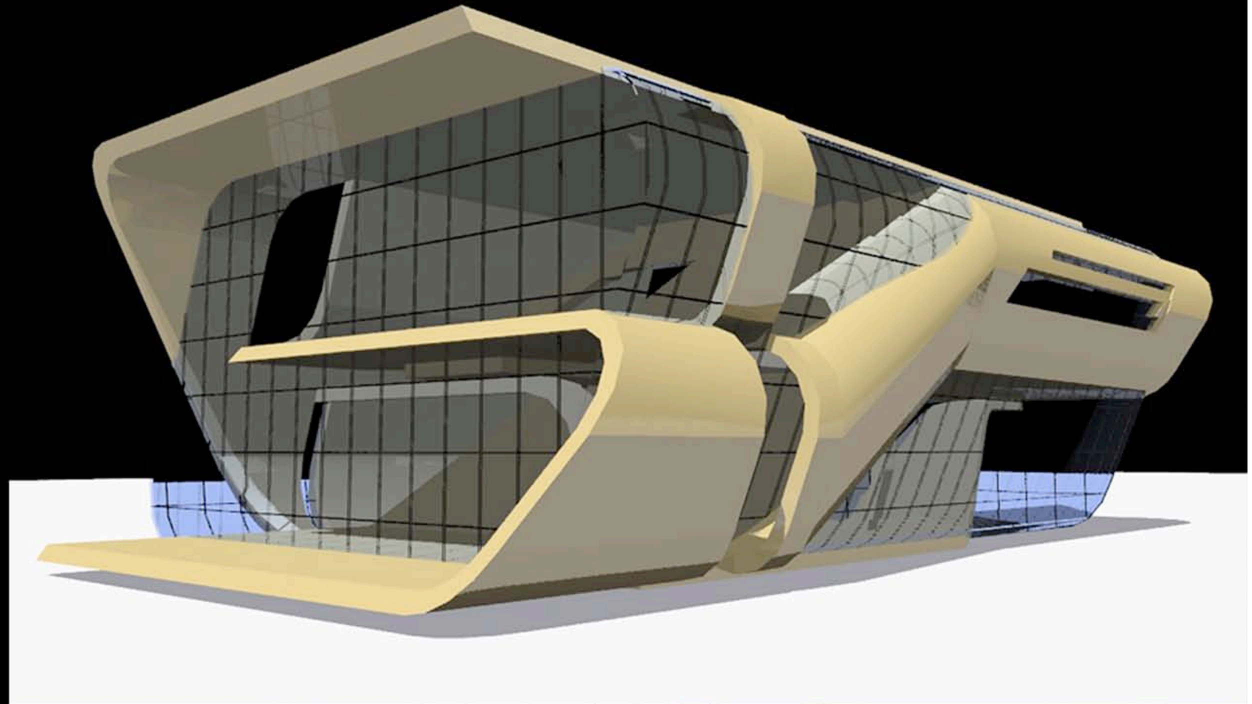
1 basic surface is not a rectangular, but a directional plane (? degrees)

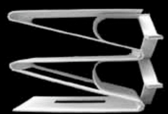
2 two components react upon/ support each other

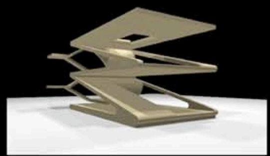
3 both surfaces follow a proportion system within/ cut down to parts

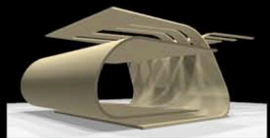
4 all folds (first or second hierarchy) are instrumentalised; to form the structure, entrance platform, or interior furniture.

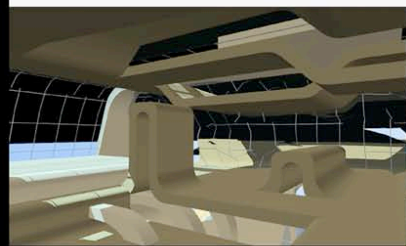
BEND SURFACE
2 COUNTERPARTS

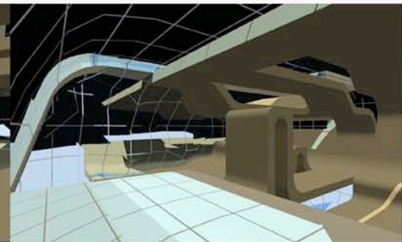


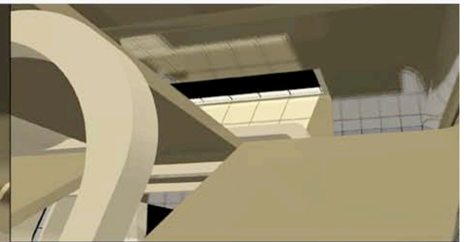












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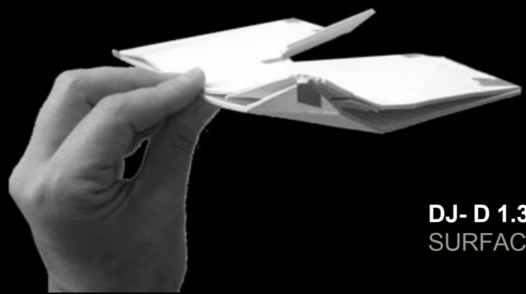
ROBERT HAGGIS (USA)

TRIANGULATED VOLUME FOLD
POCKET INSERTIONS

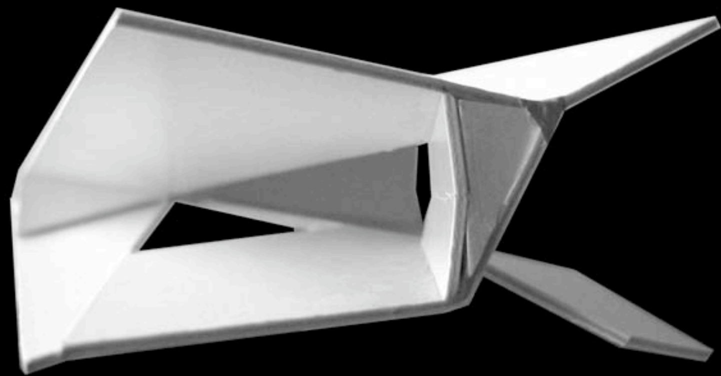
DJ- D 1.1

DJ- E 1.2

DJ- D 1.2



DJ- D 1.3
SURFACE THICKNESS

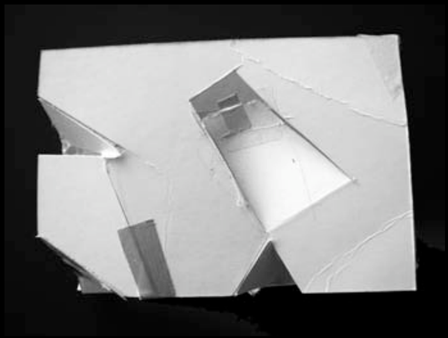


DJ- E 1.1
DOUBLE FOLD

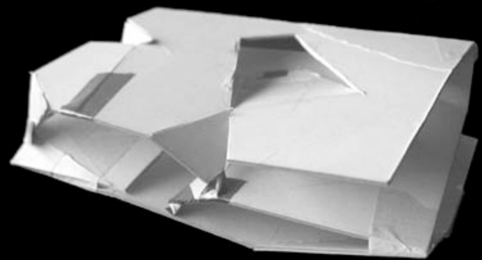
1 TRIANGULAR FOLD
0 working plane = 12 x 18 units

1 three planes react upon/ support each other

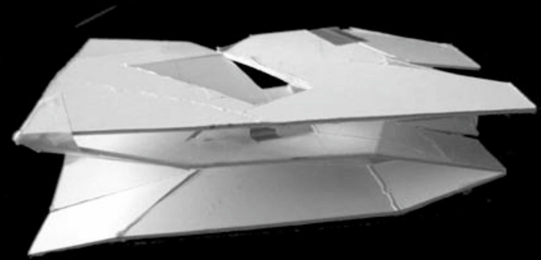
2 each plane is intuitively/ irregularly cut and folded to meet the next plane/ interaction



DJ- C 1.1
SURFACE TRIANGULAR



DJ- C 1.2



DJ- C 1.3

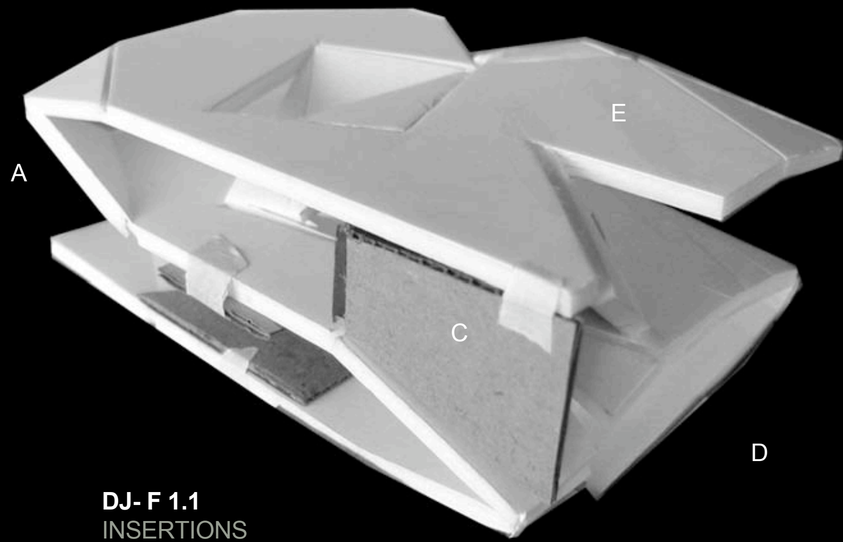
A workspace
B entrance path
C living
D pool
E roofgarden

DJ- C 1.3

>3 when an opening is cut into the plane, it remains within a 3sided cut; the substractions of each plane become structural/ circulation devices (ramp, wall). No lost material.

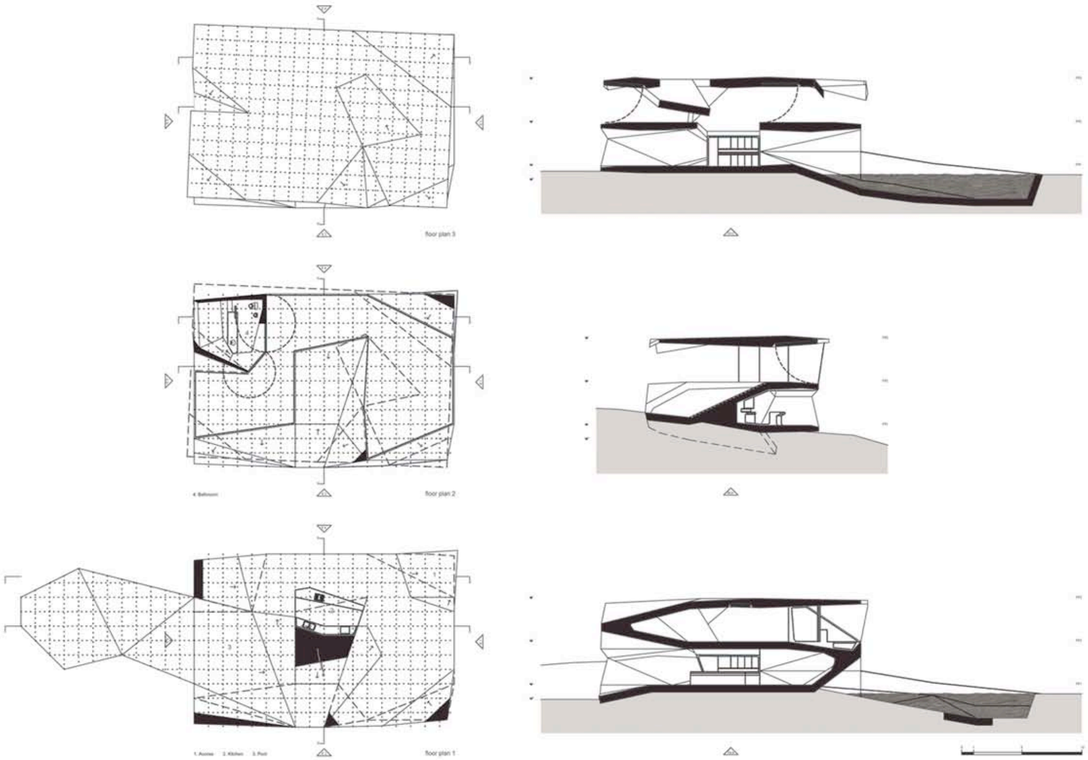
>4 partitions bended towards a neighbouring plane can be enhanced/ doubled up to form spatial pockets/ or static structure

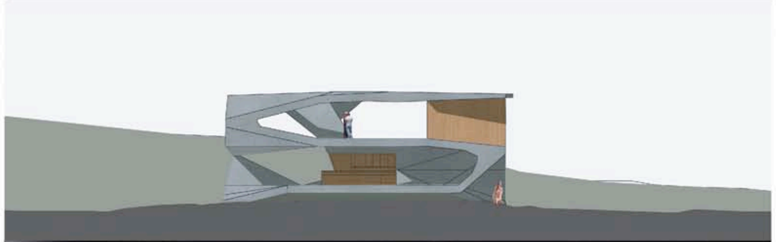
B (hidden)

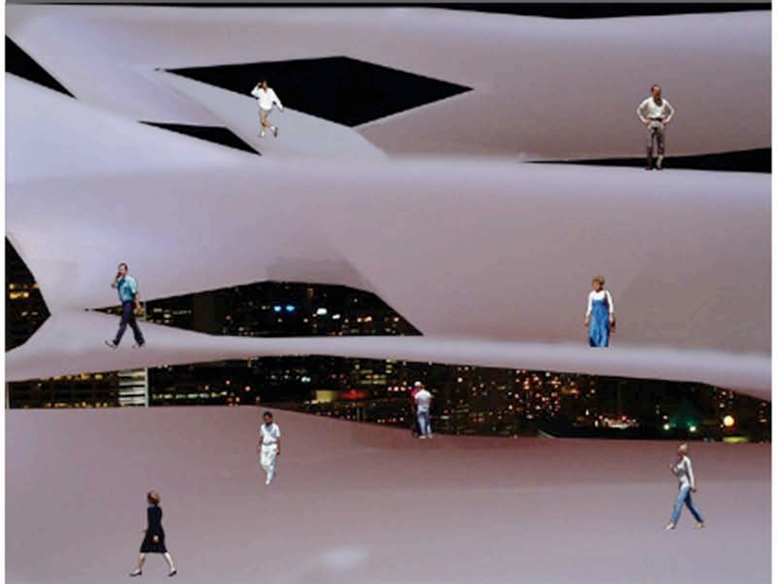


DJ- F 1.1
INSERTIONS

TRIANGULATED VOLUME FOLD
LANDSCAPE







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JAVIER DUENAS (MEXICO)