



Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

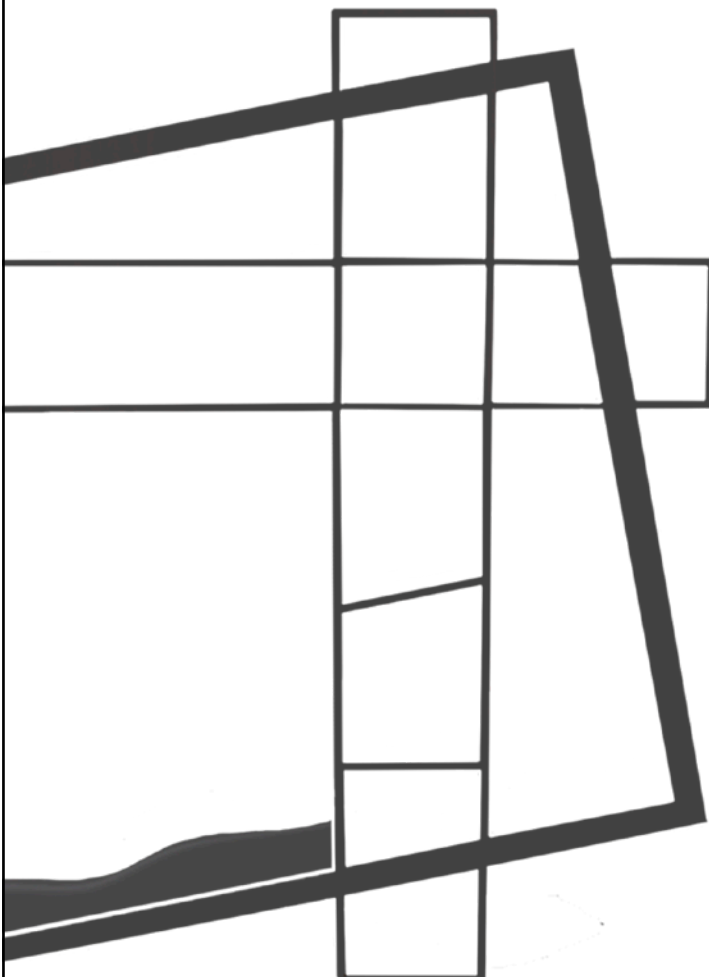


UNIVERSITAT
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PRODUCT DESIGN:

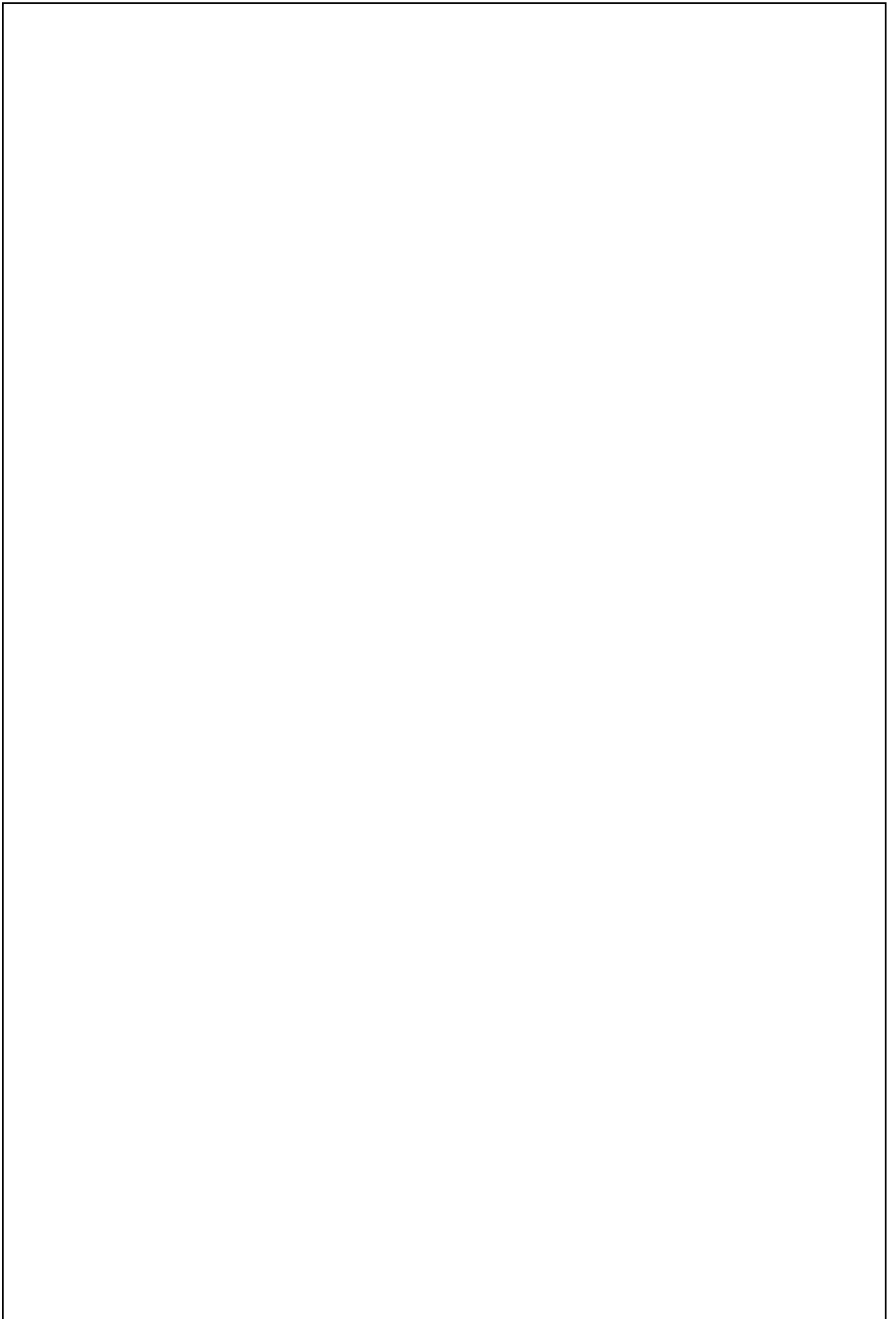
CUBE LIBRARY

Mechanical engineering and Industrial Design
Engineering and Product Development.



MARIA CRUZ ESPEJO ORIOLA

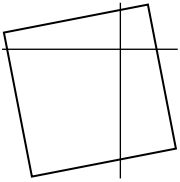
Bydgoszcz, Poland 18 June 2019





CUBE

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DESCRIPTIVE MEMORY

1.1 BACKGROUND

The design of a home furniture is proposed, taking into account the conditions of the CETEM 2018 competition. The furniture defined by the designer is a double-function bookcase that could be located both in the living room, as in an office or even in the room .

1.1.1 Specifications of initial conditions

Product needs:

- Aesthetics appropriate to the place (shape, color, texture ...)
- Simple forms (simplicity of form)
- Minimum elements
- Dimensions suitable for the function
- Material proposed "Wood"
- Adequate finish
- Easy to clean
- Average price fix to the market
- Functional appearance

1.2 OBJECT OF THE PROJECT

This project aims to develop a furniture product designed to meet different user needs, with a comfortable and practical design. It will look for an elegant and modern style, that draws attention. The product in particular must serve as a library, separator of environments and will have a reading area integrated into the furniture, so that it occupies the minimum space possible.

In addition, the design will offer a range with a variety of colors, textures and materials, so it will be perfectly integrated into any modern and contemporary home

1.3 DESIGN SPECIFICATIONS

1.3.1 Market study

An important prior step before designing the bookstore is the investigation and study of various factors, through a study of the products already existing in the market. Below are the three most representative products for the development of the new library. The rest are found in the annexes in point "2.1. Market study".

Estudio de mercado



MODEL	The cave
COMPANY	Biketjanst / 2010 (2004)
WEB	http://www.sakurah.net/collections/cave-08.html
DESIGNER	Sakura Adachi
DIMENSIONS	Height: 155 cm Width: 255 cm Deep: 60 cm
PRICE	6823 € (page BK library)
MATERIAL	Wood Wool upholstery (31 colors available) Reading light (LED-spot)
FUNCTIONS	Shelving for books, reading corner and can serve as a separator of environments.
CHARACT.	It provides a private reading space within its form, since the height of the seat is just above the floor, and gives the feeling of being hidden from those around it.

Estudio de mercado



MODEL	KidKraft
COMPANY	bebe2go
WEB	https://www.bebe2go.com/products/librero-y-sillon-natural-1
DESIGNER	_____
DIMENSIONS	Height: 57,15 cm Width: 101,6 cm Deep: 30,48 cm
PRICE	124,58 €
MATERIAL	MDF (Wood)
FUNCTIONS	Chair and bookcase.
CHARACT.	It has 6 spaces to put books. Weight: 35 Kg

Estudio de mercado



MODEL	Ransa sofa bookcase
COMPANY	Younes Duret Design
WEB	http://younesdesign.com/en/portfolio/ransa-comme-sur-un-nuage/
DESIGNER	Younes Duret
DIMENSIONS	Height: 140 cm Width: 180 cm Deep: 87 cm
PRICE	5800 €
MATERIAL	Structure: melamine metal Pillow: stain-free cloth.
FUNCTIONS	Sofa, library.
CHARACT.	Solid and light piece at the same time. For 2 persons Volume approx. of 70 books.

1.3.2 Trends

Trends serve designers to generate new proposals. The integration of information from these, provides an overview of the evolution of society and individuals, while allowing anticipate market movements.

Below are 7 trends according to the OTH (Observatory of Trends of the Habitat):

- **Antique Essence:** We look for proposals that suppose safe values in the markets. Therefore, companies seek inspiration in classical artistic trends. In addition, the importance of the brand value and the history of the company is very important.



- **From Abroad with Love:** This trend focuses on emotional aspects of the product, either because it involves non-industrial or semi-industrial production processes with shorter runs and more involvement of the personality of the designer.

- **Beta House:** The home has become a flexible container where users concentrate different types of activities: rest, food, work, leisure. At the same time, public spaces become places for leisure and meeting. Household products adapt to this new situation.



- **Let's get Smart:** The house is technified by responding to needs such as the integration of functions, intuitive relationships with the user or accessibility. In addition, products appear that respond to the paradigm of a nomadic citizen who, through technology, translates concepts from the home into the public space.

- **My Own Playground:** Fleeing current pessimism, this trend seeks a positive and childlike vision of design. In this vision there is room for the participatory product in which the user becomes a creator thanks to the advancement of manufacturing techniques.



- **Material World:** It highlights the creative spirit, through industrial experimentation, especially in relation to materials, but also in production processes. Design professionals experiment through forms, techniques and materials, forming an almost infinite range of possibilities.

- **Survival Objects:** This trend is defined by the commitment to an informal design, which avoids perfection and is sometimes presented as a survival design. It lies between the reuse of raw materials or the use of biodegradable materials and the improvisation of habitat objects from these resources.



The current trends of wood are:

Wood is still the main protagonist in home furniture. On the one hand we have the Raw trend, with very natural woods that show their imperfections without dissimulation. Marked, cracked and untreated appearance. This type of wood combines very well with an industrial touch like metal.

Otherside, the woods continue to darken. If little by little the walnut has been gaining ground in home, in the next months we will see that even darker colors are coming with force. Dark walnuts, wenge, ebony and even completely black furniture. Wood returns in black, yes, always with very marked veins that stand out in the completely black wood.



1.3.3 Target audience

Target audience or target is that segment of the market to which a good is directed, be it a product or a service.

In this case, the product is the bookstore and is aimed at both the female and male gender, focused on an audience of between 20 and 60 years old, of medium economy. This includes a target from adolescents to people of 3rd age who like reading and enjoy it.

1.4 FACTORS TO CONSIDER

1.4.1 Regulations

Rules applied to the product according to Spanish regulations:

UNE 11-017-89 - Armarios y muebles similares. Métodos de ensayo para determinar la estabilidad.

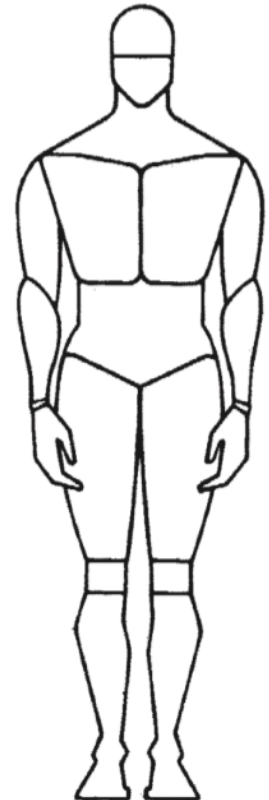
UNE 11-016-89 - Armarios y muebles similares. Métodos de ensayo para determinar la resistencia estructural.

UNE 11-023-92 - Armarios y muebles similares para uso doméstico y público. Especificaciones y características funcionales. Parte 2: Resistencia estructural y estabilidad.

1.4.2 Anthropometry

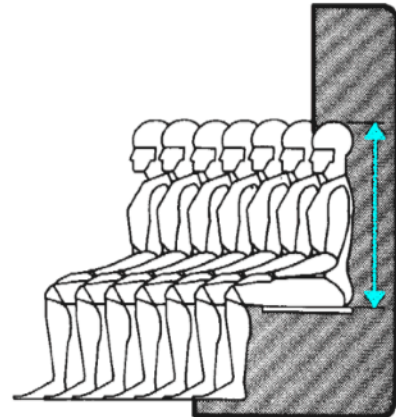
The following pages show the Spanish anthropometric tables according to “Las dimensiones humanas en los espacios interiores” from Luis Panero and Martin zelnik.

For the determination of measures it has been taken into account percentiles 5 and 95 adult men and women in centimeters, covering extreme cases.



HEIGHT IN NORMAL SEDATING POSITION

Measure necessary to determine the height at which the upper shelf should be placed, so that the user when sitting does not hit the head when sitting.



Altura en posición sedente normal* de hombre y mujeres adultos en pulgadas y centímetros, según edad, sexo y selección de percentiles†

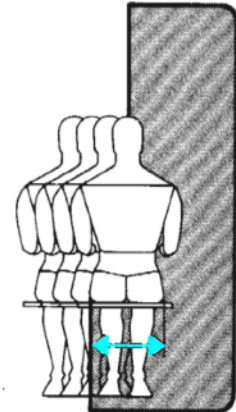
		18 a 79	18 a 24	25 a 34	35 a 44	45 a 54	55 a 64	65 a 74	75 a 79
		(Total)	Años	Años	Años	Años	Años	Años	Años
		pulg. cm	pulg. cm	pulg. cm	pulg. cm	pulg. cm	pulg. cm	pulg. cm	pulg. cm
99	HOMBRES	37.6 95,5	37.8 96,0	37.8 96,0	37.7 95,8	37.7 95,8	36.9 93,7	36.4 92,5	36.7 93,2
	MUJERES	35.7 90,7	35.7 90,7	35.9 91,2	35.8 90,9	35.5 90,2	35.4 89,9	34.9 88,6	35.0 88,9
95	HOMBRES	36.8 93,0	36.7 93,2	36.8 93,5	36.7 93,2	36.7 93,2	36.0 91,4	35.7 90,7	35.8 90,9
	MUJERES	34.8 88,1	34.8 88,4	34.9 88,6	34.9 88,6	34.6 87,9	34.4 87,4	33.9 86,1	33.4 84,8
90	HOMBRES	35.9 90,7	36.0 91,4	36.3 92,2	36.2 91,9	36.0 91,4	35.6 90,4	35.1 89,2	35.2 89,4
	MUJERES	34.1 86,6	34.3 87,1	34.5 87,6	34.4 87,4	34.0 86,4	33.8 85,9	33.1 84,1	32.8 83,3
80	HOMBRES	35.3 89,7	35.4 89,9	35.6 90,4	35.5 90,2	35.5 90,2	35.0 88,9	34.6 87,9	34.6 87,9
	MUJERES	33.6 85,3	33.7 85,6	33.8 85,9	33.8 85,9	33.5 85,1	33.2 84,3	32.5 82,6	32.3 82,0
70	HOMBRES	34.8 88,4	34.9 88,6	35.1 89,2	34.9 88,6	35.0 88,9	34.6 87,9	34.1 86,6	34.1 86,6
	MUJERES	33.1 84,1	33.4 84,8	33.4 84,8	33.3 84,6	33.0 83,8	32.8 83,3	31.9 81,0	31.8 80,8
60	HOMBRES	34.5 87,6	34.5 87,6	34.8 88,4	34.6 87,9	34.6 87,9	34.3 87,1	33.8 85,9	33.7 85,6
	MUJERES	32.7 83,1	33.0 83,8	33.0 83,8	32.9 83,6	32.7 83,1	32.4 82,3	31.6 80,3	31.4 79,8
50	HOMBRES	34.1 86,6	34.2 86,9	34.4 87,4	34.3 87,1	34.2 86,9	33.9 86,1	33.4 84,8	33.3 84,6
	MUJERES	32.3 82,0	32.6 82,8	32.6 82,8	32.6 82,8	32.3 82,0	32.1 81,5	31.2 79,2	31.0 78,7
40	HOMBRES	33.7 85,6	33.8 85,9	34.0 86,4	34.0 86,4	33.8 85,9	33.5 85,1	33.1 84,1	32.9 83,6
	MUJERES	31.9 81,0	32.3 82,0	32.3 82,0	32.3 82,0	32.0 81,3	31.7 80,5	30.8 78,2	30.6 77,7
30	HOMBRES	33.3 84,6	33.3 84,6	33.6 85,3	33.5 85,1	33.4 84,8	33.2 84,3	32.7 83,1	32.5 82,6
	MUJERES	31.5 80,0	31.9 81,0	31.9 81,0	31.9 81,0	31.5 80,0	31.3 79,5	30.4 77,2	30.1 76,5
20	HOMBRES	32.9 83,6	32.9 83,6	33.2 84,3	33.1 84,1	32.9 83,6	32.6 82,8	32.4 82,3	32.1 81,5
	MUJERES	31.0 78,7	31.3 79,5	31.4 79,8	31.4 79,8	31.1 79,0	30.8 78,2	30.0 76,2	29.2 74,2
10	HOMBRES	32.2 81,8	32.3 82,0	32.6 82,8	32.4 82,3	32.3 82,0	31.8 80,8	31.9 81,0	30.7 78,0
	MUJERES	30.2 77,2	30.6 77,7	30.7 78,0	30.8 78,2	30.3 77,0	30.2 76,7	29.3 74,4	27.6 70,1
5	HOMBRES	31.5 80,3	31.9 81,0	32.1 81,5	32.0 81,3	31.8 80,8	31.3 79,5	31.2 79,2	29.8 75,7
	MUJERES	29.5 75,2	30.1 76,5	30.1 76,5	30.2 76,7	29.7 75,4	29.7 75,4	28.7 72,9	27.1 68,8
1	HOMBRES	30.4 77,2	30.5 77,5	31.0 78,7	30.8 78,2	30.8 78,2	30.2 76,7	30.1 76,5	26.7 67,8
	MUJERES	28.2 71,6	29.2 74,2	28.9 73,4	29.2 74,2	28.7 72,9	28.3 71,9	27.0 68,6	14.8 37,6

* Definición de altura en posición sedente, normal: ver Tabla 1E

† Medida bajo la cual desciende el porcentaje de personas indicando en el grupo de edad dado.

HIP WIDTH

Necessary to determine the width of the structure and that the user is comfortable to sit down.



		Anchura de caderas de hombres y mujeres adultos en pulgadas y centímetros, según edad, sexo y selección de percentiles†															
		18 a 79 (Total)		18 a 24 Años		25 a 34 Años		35 a 44 Años		45 a 54 Años		55 a 64 Años		65 a 74 Años		75 a 79 Años	
		pulg.	cm	pulg.	cm	pulg.	cm	pulg.	cm	pulg.	cm	pulg.	cm	pulg.	cm	pulg.	cm
99	HOMBRES	17.0	43,2	17.3	43,9	17.4	44,2	17.1	43,4	16.9	42,9	16.9	42,9	16.6	42,2	16.5	41,9
	MUJERES	18.8	47,8	18.4	46,7	19.0	48,3	19.2	48,8	19.0	48,3	18.7	47,5	18.2	46,2	17.1	43,4
95	HOMBRES	15.5	40,4	15.8	40,1	16.0	40,6	15.9	40,4	16.0	40,6	15.9	40,4	15.7	39,9	15.5	39,4
	MUJERES	17.0	43,4	16.9	40,4	16.8	42,7	17.3	43,9	17.6	44,7	17.4	44,2	17.3	43,9	16.8	42,7
90	HOMBRES	15.5	39,1	15.0	38,1	15.6	39,6	15.6	39,6	15.7	39,9	15.6	39,6	15.1	38,4	14.9	37,8
	MUJERES	16.4	41,7	15.4	39,1	16.0	40,6	16.5	41,9	16.7	42,4	16.8	42,7	16.7	42,4	16.5	41,9
80	HOMBRES	14.9	37,8	14.6	37,1	14.9	37,8	15.0	38,1	15.1	38,4	15.0	38,1	14.7	37,3	14.5	36,8
	MUJERES	15.6	39,6	14.8	37,6	15.3	38,9	15.7	39,9	15.8	40,1	16.0	40,6	15.9	40,4	15.8	40,1
70	HOMBRES	14.6	37,1	14.1	35,8	14.6	37,1	14.7	37,3	14.8	37,6	14.6	37,1	14.5	36,8	14.2	36,1
	MUJERES	15.1	38,4	14.4	36,6	14.8	37,6	15.1	38,4	15.4	39,1	15.6	39,6	15.4	39,1	15.0	38,1
60	HOMBRES	14.3	36,3	13.8	35,1	14.3	36,3	14.4	36,6	14.5	36,8	14.3	36,3	14.2	36,1	13.9	35,3
	MUJERES	14.7	37,3	14.1	35,3	14.4	36,6	14.8	37,6	15.0	38,1	15.1	38,4	14.9	37,8	14.5	36,8
50	HOMBRES	14.0	35,6	13.5	34,3	14.0	35,6	14.1	35,8	14.2	36,1	14.0	35,6	13.9	35,3	13.6	34,5
	MUJERES	14.3	36,3	13.8	35,1	14.0	35,6	14.5	36,8	14.6	37,1	14.7	37,3	14.6	37,1	14.0	35,6
40	HOMBRES	13.7	34,8	13.3	33,8	13.7	34,8	13.8	35,1	13.9	35,3	13.7	34,8	13.6	34,5	13.4	34,0
	MUJERES	14.0	35,6	13.5	34,3	13.7	34,8	14.2	36,1	14.2	36,1	14.3	36,3	14.3	36,3	13.7	34,8
30	HOMBRES	13.4	34,0	13.0	33,0	13.4	34,0	13.5	34,3	13.5	34,3	13.4	34,0	13.4	34,0	13.2	33,5
	MUJERES	13.6	34,5	13.2	33,5	13.4	34,0	13.8	35,1	13.8	35,1	13.9	35,3	14.0	35,6	13.3	33,8
20	HOMBRES	13.1	33,3	12.6	32,0	13.1	33,3	13.3	33,8	13.2	33,5	13.1	33,3	13.1	33,3	12.9	32,8
	MUJERES	13.3	33,8	12.8	32,5	13.1	33,3	13.4	34,0	13.4	34,0	13.6	34,5	13.5	34,3	13.0	33,0
10	HOMBRES	12.5	31,8	12.5	31,0	12.5	31,8	12.9	32,8	12.6	32,0	12.6	32,0	12.6	32,0	12.4	31,5
	MUJERES	12.7	32,2	12.3	31,2	12.6	32,0	12.9	32,8	13.0	33,0	13.2	33,5	12.9	32,8	12.2	31,0
5	HOMBRES	12.0	31,0	12.0	30,5	12.2	31,0	12.4	31,5	12.2	31,0	12.2	31,0	12.2	31,0	12.1	30,7
	MUJERES	12.1	31,2	12.1	30,7	12.2	31,0	12.4	31,5	12.4	31,5	12.9	32,8	12.4	31,5	11.7	29,7
1	HOMBRES	11.5	29,7	11.3	28,7	11.7	29,7	12.0	30,5	11.5	29,2	11.6	29,5	11.4	29,0	11.4	29,0
	MUJERES	11.7	29,7	11.3	28,7	11.5	29,2	12.0	30,5	12.0	30,5	12.1	30,7	12.1	30,7	9.8	24,9

* Definición de anchura de caderas: ver Tabla 1J.
 † Medida bajo la cual desciende el porcentaje de personas indicado en el grupo de edad dado.

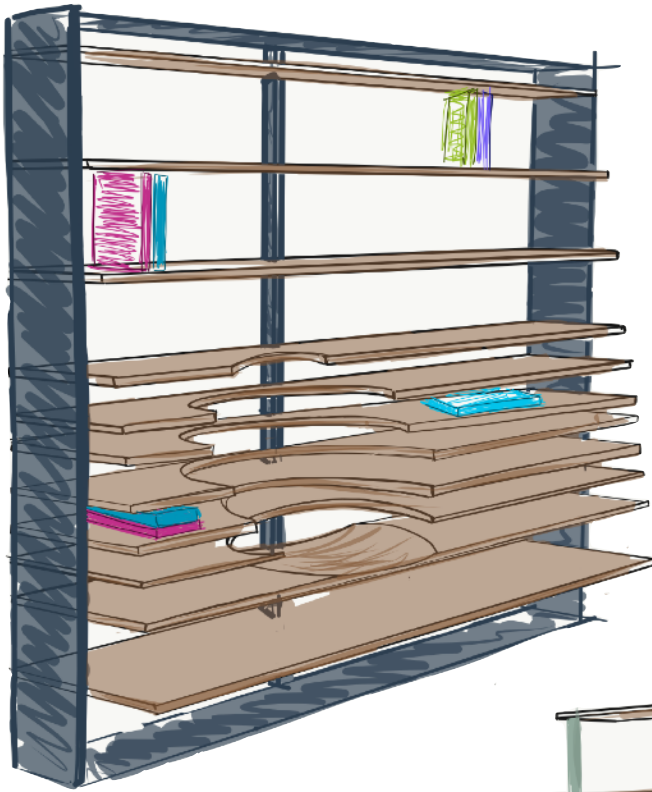
1.5 BRIEFING

Once the market study and trends about reading furniture have been carried out; Taking into account the established requirements and attending to a target audience, it has been concluded that the factors to be considered in the design of the elements to be defined in this project are:

- Main objective: Design a piece of furniture for the home entirely in wood. In this case a library.
- Materials to be used: The material used for its construction must be wood, properly treated and with an optimum finish.
 - At all times the characteristics of the material used will be taken into account. Rigidity, stability, hardness, etc.
- Dimensions: For the use of 1 or 2 people and a volume of between 50 and 100 books.
- Ergonomic aspects: The user's posture will be sedative (sitting).
 - The distribution of the load and the balance must be studied correctly.
 - The correct anthropometric measurements of the individual must be respected.
- Target: Focused on an audience between 20 and 60 years old, of medium economy.
- Multifunction: It is possible to give other uses or functions.
- Technical aspects: It must be for interior, contain minimal elements and simple forms.
- Aesthetic aspects: It is possible to paint or lacquer wood. Wood could also be combined with other material, provided that the wood predominates.
- Packaging: If the model requires it, a packaging can be made.

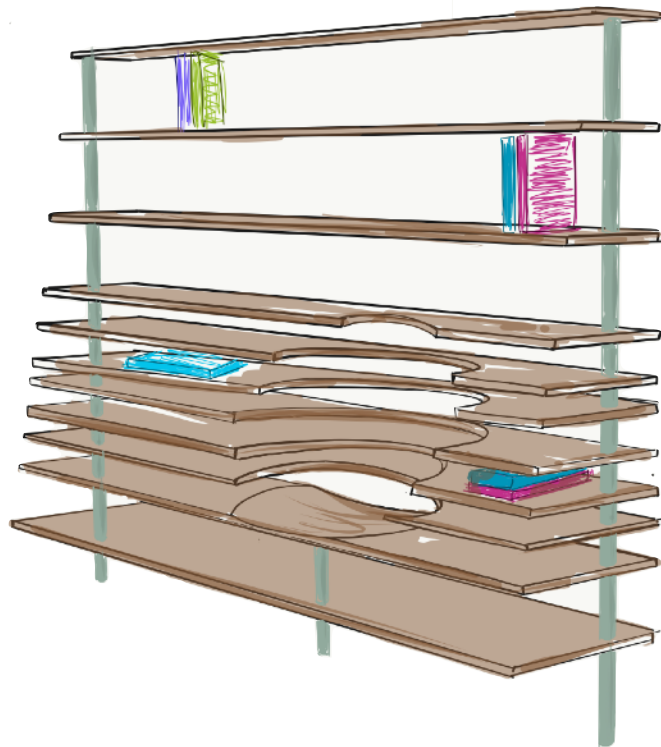
1. 6 IDEATION

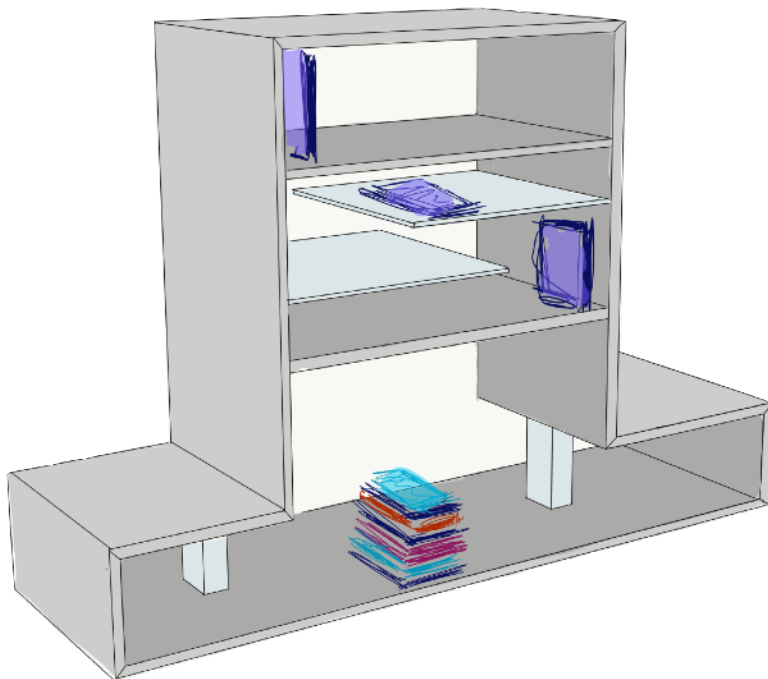
In this stage a series of preliminary ideas to the choice of the definitive library is shown.



■ **SOLUTION A:** It is a large furniture. Formed by wooden shelves arranged as serial planes and a steel frame to reinforce the structure.

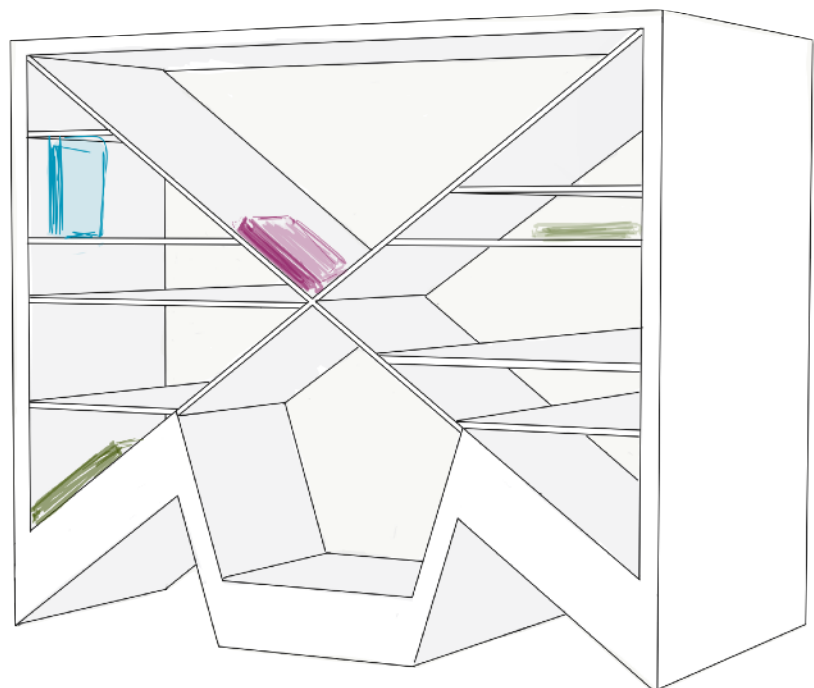
■ **SOLUTION B:** It is a large furniture. Formed by wooden shelves arranged as serial planes, screwed to the wall and reinforced with vertically arranged aluminum tubes.

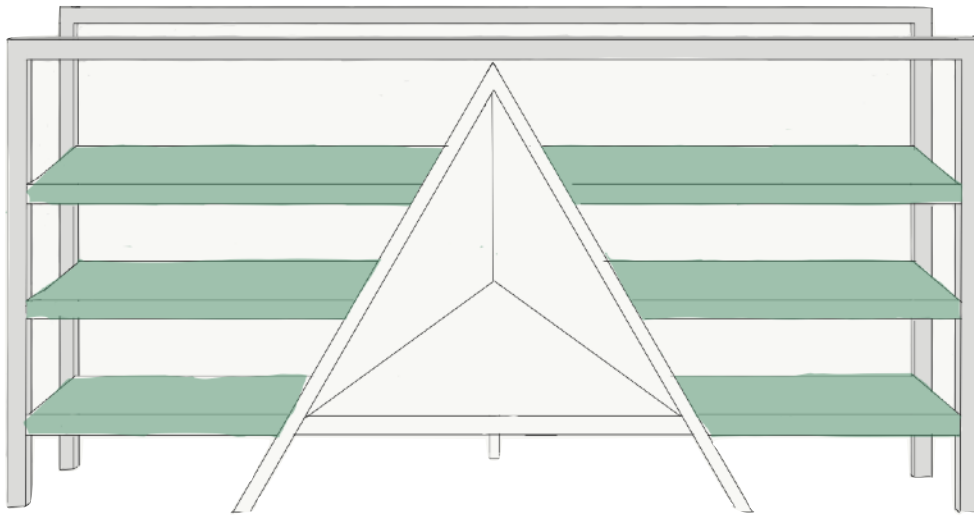




■ **SOLUTION C:** It is a medium size furniture, with 2 reading areas on its sides. Wood is combined with steel.

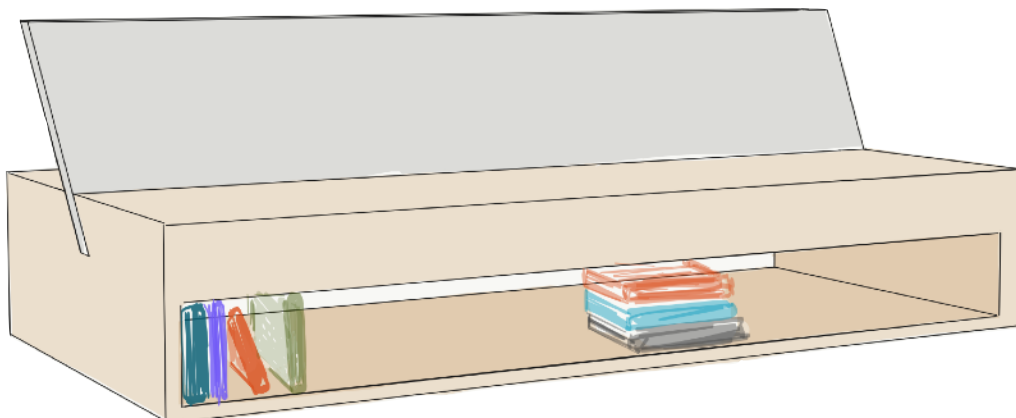
■ **SOLUTION D:** It is a large furniture. Formed by an X-shaped structure and a pentagonal shape in the center that serves as a reading area, with light incorporated in the upper part.





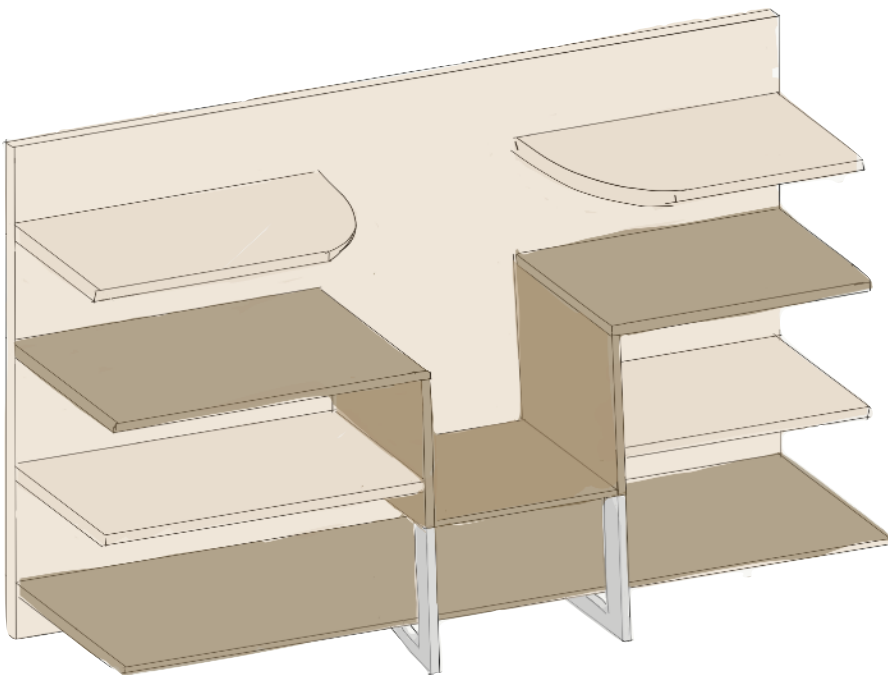
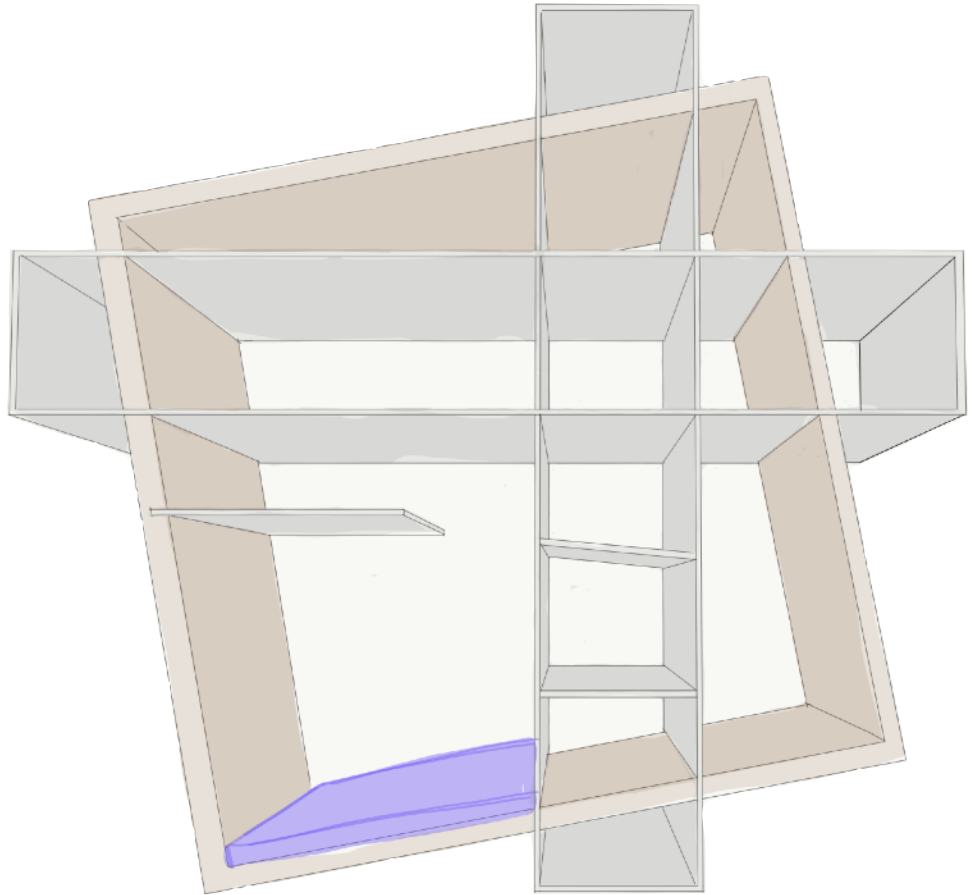
■ **SOLUTION E:** The center pyramid is reminiscent of Indian tents and the green shelves represent the cactus. These shelves are fastened by a metal structure.

■ **SOLUTION F:** It is a robust design but at the same time light, thanks to the combination of wood and metal. Books can be deposited at the bottom of the bank.

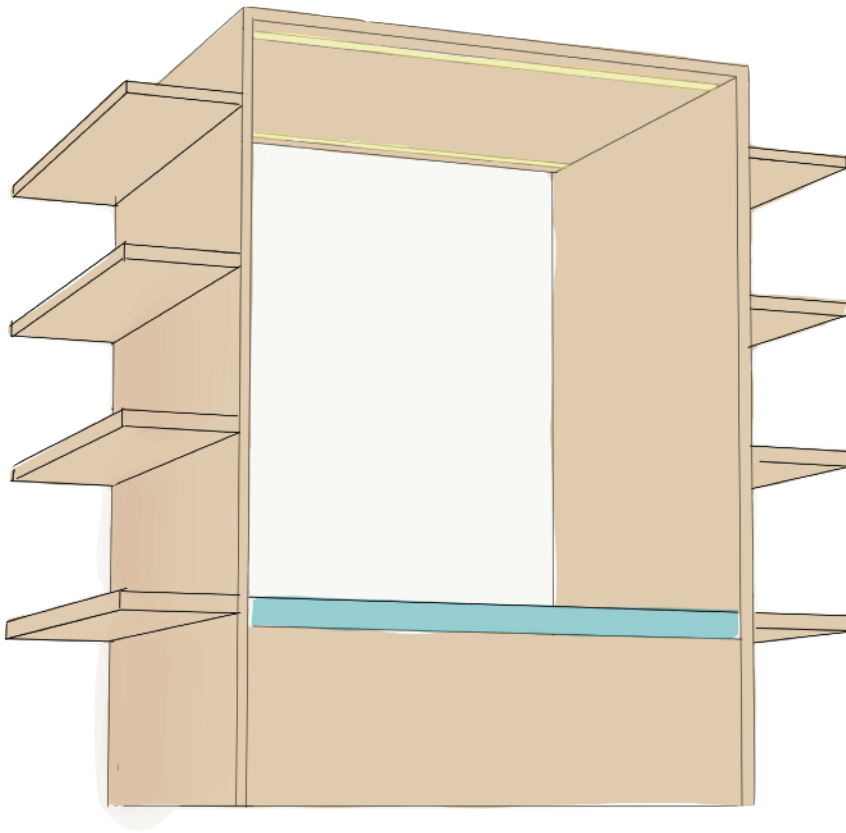


■ SOLUTION G:

It is a large furniture with simple shapes that give a light appearance to the design.

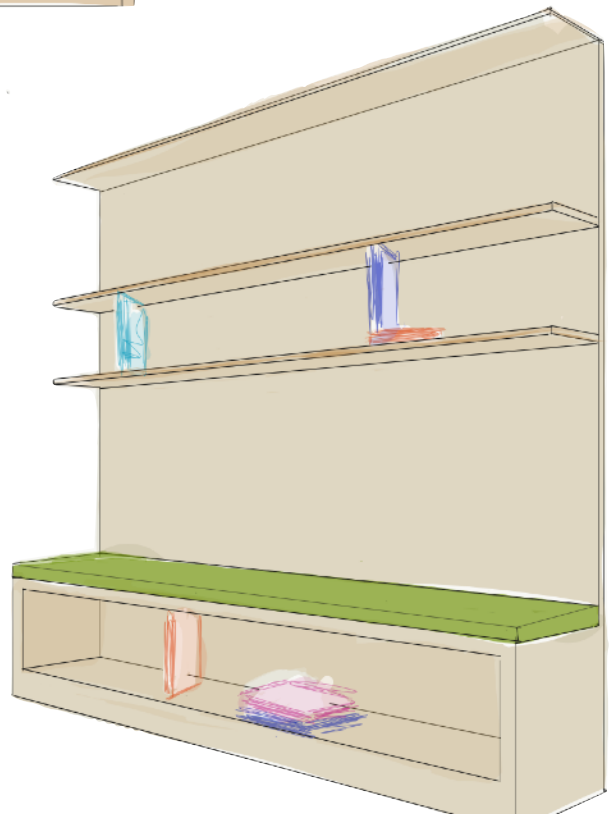
**■ SOLUTION H:**

It is a rigid furniture, with shelves and a seat in the central part, which is supported by aluminum profile legs.



■ **SOLUTION I:**
 This is a library of little storage, but at the same time serves as a separator of environments. It has 2 LED strips incorporated for reading.

■ **SOLUTION J:** Wooden bench which incorporates a backrest with shelves. In the lower part of the seat you can store more books.



1. 7 JUSTIFICATION AND DESCRIPTION OF ADOPTED SOLUTIONS

After several design ideas, it is decided to use the technique of weighted technical value (VTP) to choose the most optimal proposal according to the needs mentioned in point 1.1.1 specifications.

VTP	IMPORTANCIA	A	B	C	D	E	F	G	H	I	J
Esthetic	10	10 100	9 90	7 70	8 80	7 70	8 80	10 100	3 30	5 50	5 50
Simple shapes	7	9 63	9 63	8 56	7 49	7 49	9 63	9 63	7 49	8 56	8 56
Minimum elements	6	7 42	7 42	7 42	6 36	7 42	8 48	8 48	6 36	6 36	7 42
Suitable dimensions	10	8 80	8 80	8 80	7 70	7 70	8 80	10 100	7 70	7 70	7 70
Wood material	8	6 48	7 56	8 64	10 80	6 48	6 48	10 80	8 64	10 80	10 80
Light	6	6 36	7 42	8 48	6 36	9 54	6 36	7 42	6 36	6 36	7 42
Proper finish	10	10 100	9 90	9 90	9 90	8 80	9 90	10 100	6 60	7 70	7 70
Easy to clean	8	7 56	6 48	8 64	6 48	6 56	8 64	7 56	7 56	7 56	8 64
Price	9	6 54	7 63	8 72	7 63	7 63	6 54	8 72	6 54	8 72	8 72
Functional	10	8 80	8 80	9 90	8 80	7 70	7 70	10 100	6 60	7 70	8 80
TOTAL	84	559	654	676	632	602	633	761	515	596	626
VTP	-	0,665	0,778	0,805	0,752	0,717	0,754	0,906	0,613	0,709	0,745

Finally, as indicated in the table above, the option with the highest VTP is solution G, with a value of 0.906.

1.8 MATERIALS AND SURFACE FINISHES

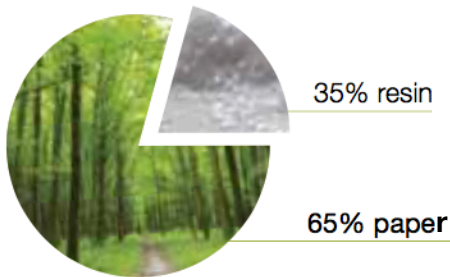
1.8.1 Materials

The material selected for the manufacture of the set will be wood.

Wood is a renewable, biodegradable and recyclable resource, as well as being economical and very easy to work with. It is the lightest construction material, resistant and easy to work with.

SET

The entire structure is made of agglomerated board of two types, MD agglomerate and veneered.



The agglomerate is a relatively ecological and economic material, made with wood shavings of leftover remains of other woods. Soft woods are generally used, although a proportion of hard and burned woods from fires is sometimes incorporated. The particles are joined together by resins that respect the environment and then pressed to form the board.

A current standard agglomerate is manufactured in various densities to the thickness, being the interior of less fine particles, thus giving less density and lightening the overall weight of the board.



- Smooth and homogeneous surface.
- Resistant to high temperature and humidity.
- Optimal behavior in later transformation.
- Specific for indoor furniture in dry environment.

In this case, the company "Tableros Martinez S.L" was chosen. A company concerned about ecology and sustainability, demanding from its suppliers the PEFC certifications of sustainable forest exploitation.

- The **agglomerate DM**: is a board formed by wood particles pressed in dry, very uniform, very easy to work and very resistant to changes in temperature.

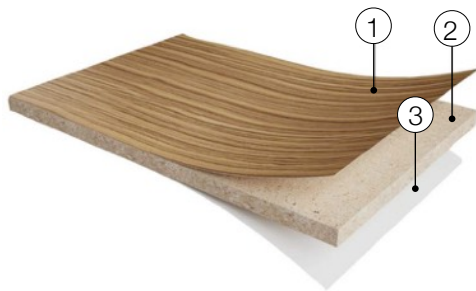
Usually it's color is medium-dark brown and is perfect for lacquering or painting.

The 22 mm thick MDF board has been chosen for the shelves.



- The **Repelled agglomerate**: it is a three-layer agglomerate that has been stuck on its faces natural wood veneer. It is the most expensive to use natural wood to cover it.

It has been chosen board of agglomerate veneered in two different finishes, Walnut and Oak, 11 mm thick, for the main frame.



1 - NATURAL WOODEN PLATE
2 - AGGLOMERATED BOARD
3 - NATURAL WOODEN PLATE



NOGAL PACÍFICO TABACO
H3702 | ST10

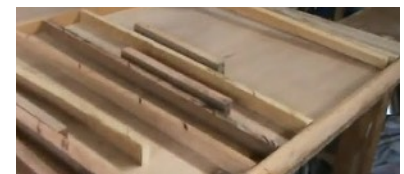


ROBLE BARDOLINO NATURAL
H1145 | ST10

The main frame will be manufactured with the technique of “entamborado” to obtain a thickness of 80mm, so you will need **pine strips** as padding / internal structure.



Pine is an economical, lightweight material with good resistant characteristics.



These are machined slats without polishing and without retracting so that their final price is more economical.

PILLOW

The pillow should be stain-resistant fabric for better appearance and increase durability.

The Aquaclean company has been chosen, which uses PFC-free technologies (Perfluorocarbons) and supports ecological manufacturing through responsible consumption.



The **Thecnology Aquaclean®** is a revolutionary treatment that allows stains to be cleaned simply by using a little water. Thus achieving a simple maintenance and in a minimum time.

They are proposed as colors broken White and Dark Gray, to give the user the possibility to choose the combination you want.



Bellagio 01
Blanco roto



Bellagio 131
gris

1.8.2 Lacquered

Varnishing a wood board is painted with varnish or lacquer, which is a liquid termination wood dried by evaporation of solvents containing. It is applied with a pressure gun in several layers, giving a smooth final appearance, being able to choose its matt, shiny or superbright finish if it is polished later.

To obtain a good lacquer, you must give 2 coats of sand and between them and a last coat with the desired varnish or color.

In the case of the CUBE library, everything is lacquered but in different lacquers, therefore different finishes:

- The frame (subset 1) has a colorless lacquer so that the natural grain of the wood is seen.
- The shelves (subset 2 and 3) are lacquered with colors from the RAL chart, giving the possibility to choose between a wide color combination. (See point 1.8.5)

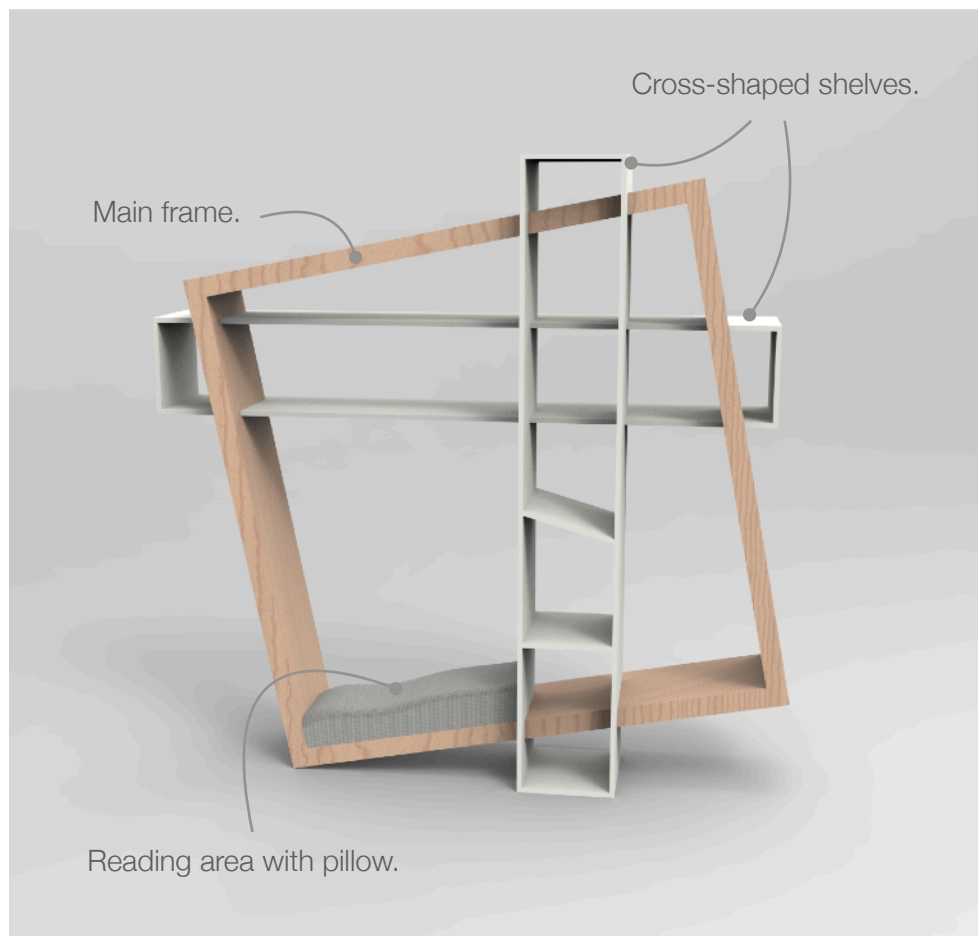
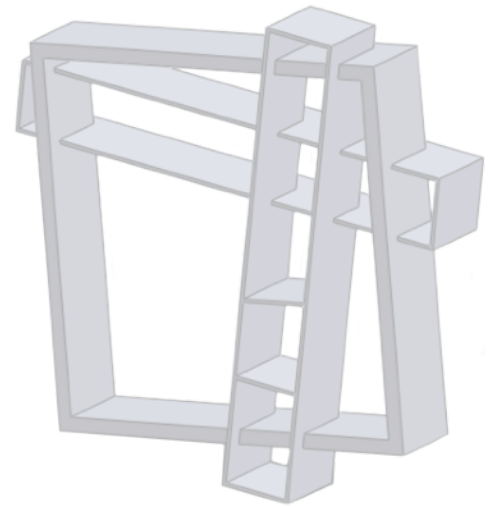
* RAL is a European color combination system that defines colors for paints, plastics and coatings.



1.8.3 Proposal developed

The proposal developed is a multifunctional furniture, which allows you to store books and read them in the same space.

It is a square frame rotated 11° and that supports in one of its lower corners. This frame is interrupted by 2 shelves, one vertical and one horizontal, forming a cross displaced to one of the sides leaving space for the reading area. The vertical is the one that supports and allows the 11th inclination of the frame.



1.8.4 Suggested combinations

It is planned to manufacture the set in different finishes, seeking to adapt the product to different tastes and environments. Each subset will be available in different colors, and can be combined to suit the buyer.

- The frame will be available in Walnut and Oak finish.
- For subset 2 and 3 you can choose between 24 colors within the RAL Classic collection.
- Finally, the cushion will be available in broken white or dark gray.

Available colors for the frame:



Available colors for shelves:



Available colors for the pillow:



Here are some possible combinations:



Fig. R 3014 - 001

R 3014 - 001

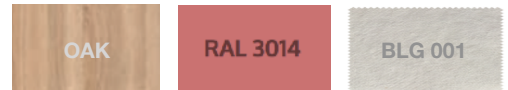


Fig. R 5007 - 001

R 5007 - 001

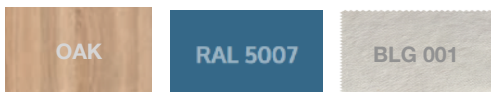
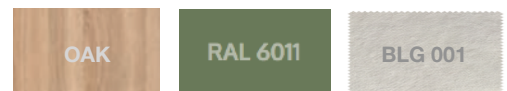


Fig. R 6011 - 001

R 6011 - 001



R 9016 - 001

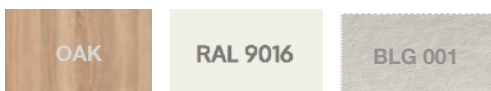


Fig. R 9016 - 001



Fig. N 9005 - 131

N 9005 - 1311

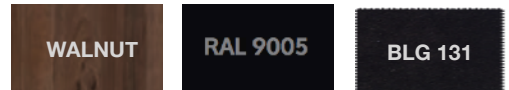


Fig. N 7005 - 131

N 7005 - 131

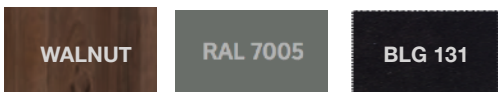
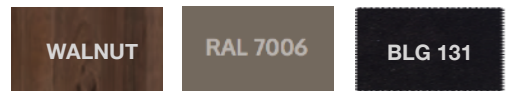


Fig. N 7006 - 131

N 7006 - 1311



N 4007 - 1311

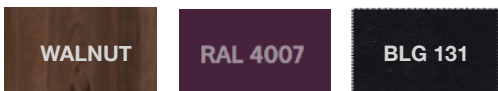


Fig. N 4007 - 131

1.9 TECHNICAL AND PHYSICAL VIABILITY

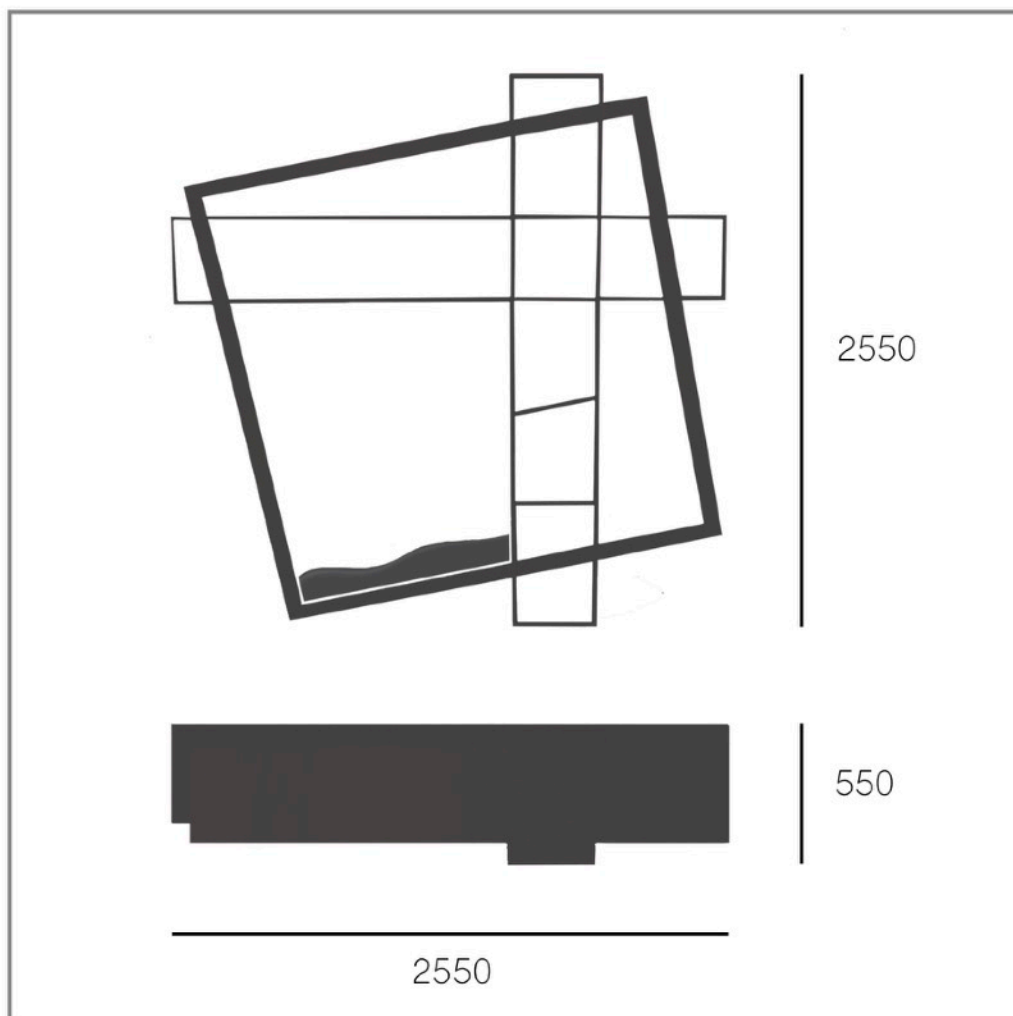
1.9.1 Furniture dimensions

The measures of the furniture have been established taking into account the adaptation to the profile of the user. It is a robust set of large measures, but transmits lightness in turn through transparency and fine profile.

The whole set makes 255cm equal to the width. These measurements coincide with the dimensions of the shelves that form a displaced cross.

Of deep it makes 55 cm, adding the 45 cm of the main frame and 10 cm that protrudes the vertical shelf by some of the sides.

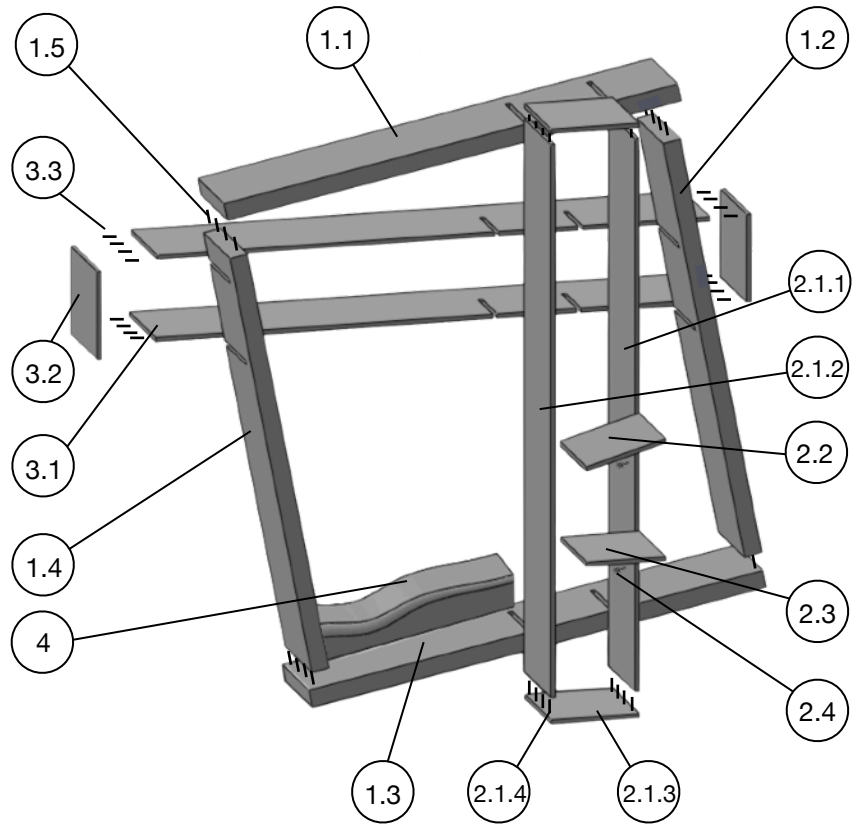
Below are the general measures that make up the CUBE library:



General measures

1.9.2 Exploded

Each of the elements that make up the CUBE Library, with its respective denomination, material and number of units, is shown in the explosion.



Exploded view

MARK	DENOMINATION	MATERIAL	UNITS
1.1	M superior	Wood	1
1.2	M right lateral	Wood	1
1.3	M inferior	Wood	1
1.4	M left lateral	Wood	1
1.5	Espiga Ø12	Wood	16
2.1.1	V right lateral	Wood	1
2.1.2	V left lateral	Wood	1
2.1.3	V top	Wood	2
2.1.4	V Espiga Ø8	Wood	16
2.2	Superior Shelf	Wood	1
2.3	Inferior Shelf	Wood	1
2.4	Soporte estante	Wood	8
3.1	H pared	Wood	2
3.2	H tapa	Wood	2
3.3	H Espiga Ø8	Wood	16
4	Pillow	Fabric	1

- * M: Frame
- * V: Vertical shelf
- * H: Horizontal shelf

1.9.3 Ergonomics

Ergonomics applied to product design is the science that invests its design efforts in creating products that adapt to the capabilities and needs of man. It focuses, then, on the user of the product, and its main objectives are to ensure that the products are easy to use, easy to learn to manage, safe and adapted to the user's characteristics.

Therefore, for the design of any furniture it is necessary to meet certain basic specifications marked by ergonomics and anthropometry, which analyze the user-product interaction, always trying to improve the existing, sticking to the comfort of the user, and with it, the durability and product functionality.

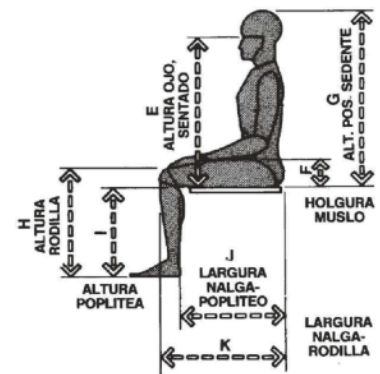
The anthropometric values used in the library are:

- **Height in normal sitting position:**

Said measure is necessary to determine the height at which the upper shelf is to be placed, so that the user when seated does not hit himself on the head.

The most indicated data are those corresponding to the 95th percentile by virtue of the intervening slack factor.

		E	F	G	H	I	J	K
		cm	cm	cm	cm	cm	cm	cm
95	Men	86,5	19,1	99,0	60,3	47,8	55,1	65,4
	Women	79,6	14,9	91,5	54,3	44,2	52,7	62,0
5	Men	76,4	88,5	88,5	52,1	40,4	46,4	56,4
	Women	69,5	81,2	81,2	46,7	37,8	43,7	53,3

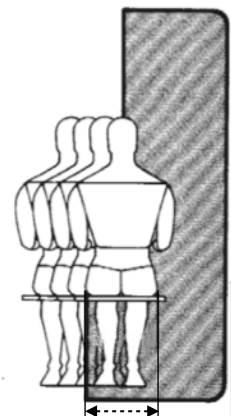


Sizing the body in a sitting position

- **Hip width:**

Necessary to determine the width of the structure and that the user finds it comfortable to sit down.

		19-79 (Total)	18-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65-74 Years	75-79 Years
		cm	cm	cm	cm	cm	cm	cm	cm
95	Men	40,4	40,1	40,6	40,4	40,6	40,4	39,9	39,4
	Women	43,4	40,4	42,7	43,9	44,7	44,2	43,9	42,7
5	Men	31,0	30,5	31,0	31,5	31,0	31,0	31,0	30,7
	Women	31,2	30,7	31,0	31,5	31,5	32,8	31,5	29,7

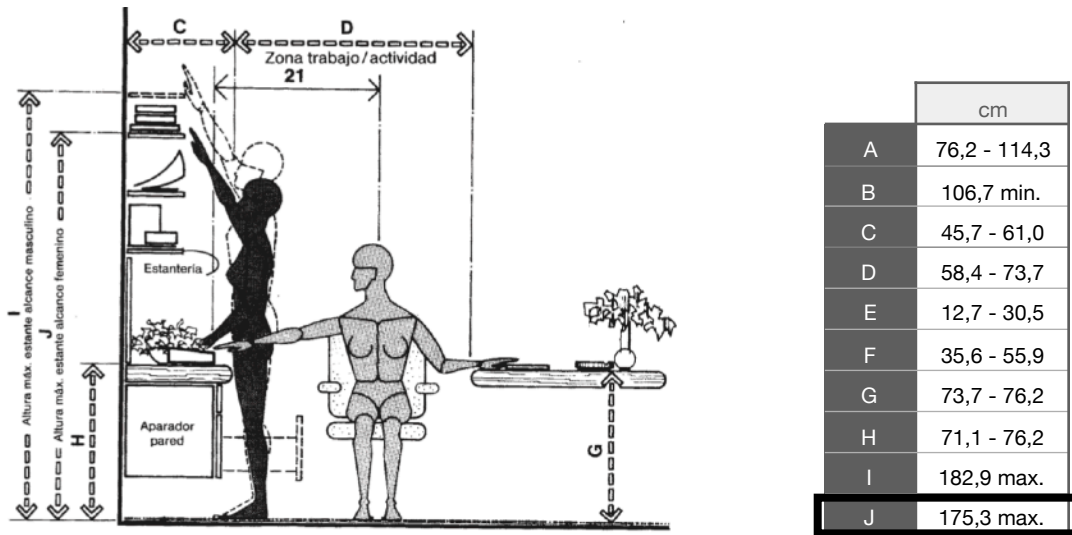


Hip width measurements

• **Maximum rack height:**

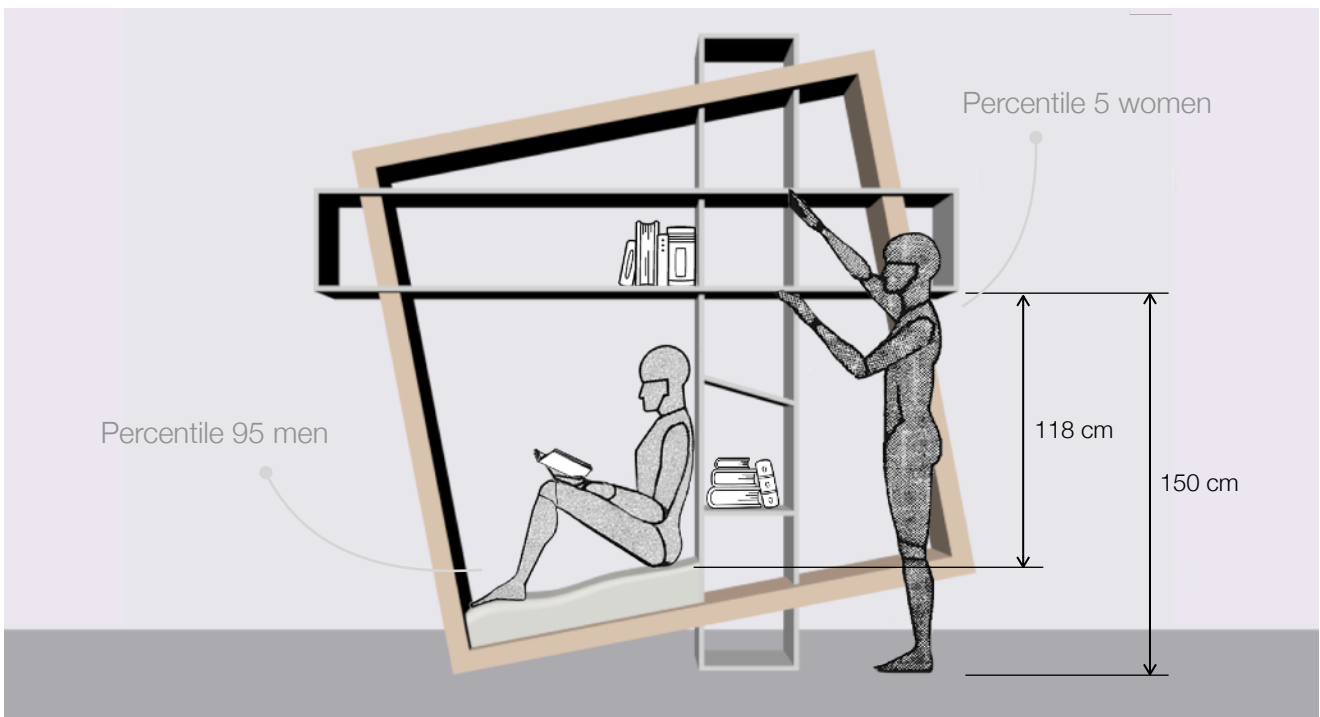
Said measure is necessary to determine the height at which the upper shelf has to be located, so that the user can access the books without difficulty.

The most indicated data are those corresponding to the feminine scope.



Furniture accessibility

By relating all the above data, the user-product relationship is completely defined and the height of the furniture can be considered appropriate, since the shelf is located 150 cm from the floor, the maximum being 175.3 cm.



1.9.4 Assembling the components by the user

In this case, the assembly is made by the user, which is the store that provides the furniture.

The assembly of the library is relatively simple, since the assembly of the different components is done by means of spikes and pressure eccentrics. To do this, the different elements must be placed in their respective holes.

As for the assembly of the assembly, the design itself allows a rigid and safe assembly.

Finally the leveling legs and the shelf supports must be placed next to the shelves.

1.10 STRUCTURAL RESISTANCE OF THE PRODUCT

The calculation of the structural resistance of the library has been studied with the SolidWorks program.

SolidWorks is a software of CAD for modeling in 2D and 3D, this allows to model pieces and set and extract from them both technical plans and other information such as in this case, the Forces.

In this study, the following information has been obtained:

MODEL INFORMATION



Model name: SET

Solids			
Reference	Treated as	Volumetric properties	Modification date
	Solid	Masa:0.0635507 kg Volumen:0.000397217 m³ Densidad:159.99 kg/m³ Peso:0.622797 N	---

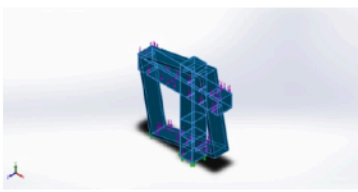
STUDI PROPERTIES

Study name	Estructural resistance
Type of analysis	Buckling
Type of mesh	Solid mesh
Number of modes	1
Type of solver	FFEPlus
Incompatible rigid binding options	Automatic
Thermal effect	Activate
Thermal option	Include thermal loads
Temperature at zero voltage	298 Kelvin
Include the effects of fluid pressure from SOLIDWORKS Flow Simulation Simulation	Desactivate
Soft Spring	Desactivate
Results folder	SOLIDWORKS document

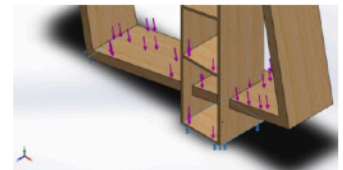
UNITS

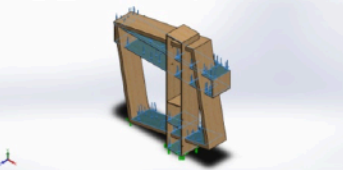
Unit system	Metric (MKS)
Length/Displacement	mm
Temperature	Kelvin
Angular velocity	Rad/seg
Pressure/Tension	N/m ²

MATERIAL PROPERTIES

References	Properties	Components
	<p>Nombre: Aglomerado Tipo de modelo: Isotrópico elástico lineal</p> <p>Límite elástico: 2e+007 N/m² Densidad: 159.99 kg/m³ Módulo elástico: 3e+009 N/m² Coefficiente de Poisson: 0.29</p>	SET
Datos de curva:N/A		

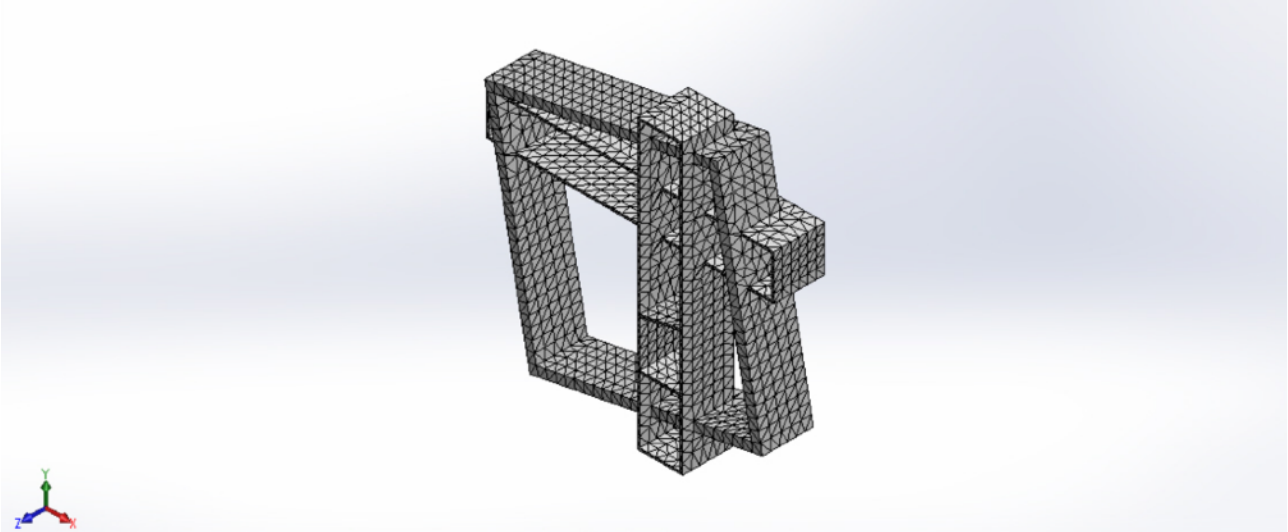
PROPIEDADES DE ESTUDIO

Nombre de sujeción	Imagen de sujeción	Detalles de sujeción
Fijo-1		Entidades: 1 arista(s), 1 cara(s) Tipo: Geometría fija

Nombre de carga	Cargar imagen	Detalles de carga
Fuerza-1		Entidades: 5 cara(s) Tipo: Aplicar fuerza normal Valor: 2000 N

MESH INFORMATION

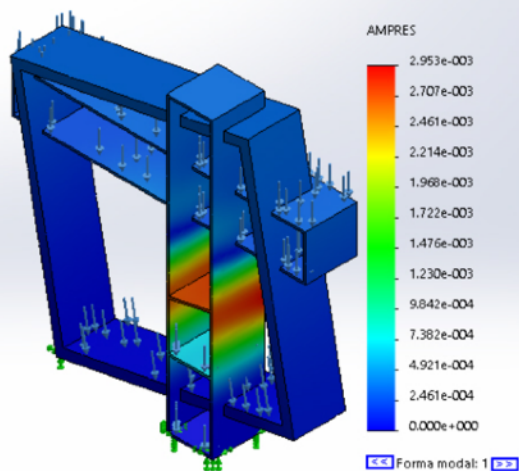
Mesh type	Solid mesh
Mallador used	Standard mesh
Automatic transition	Desactivate
Include automatic mesh loops	Desactivate
Jacobian points	4 Points
Size of elements	8.82574 mm
Tolerance	0.441287 mm
Mesh quality tracing	Quadratic elements of high order
Total number of nodes	17206
Total number of elements	8482
Maximum aspect ratio	23.501
%of elements whose aspect ratio is <3	45.2
% of elements whose aspect ratio is >10	483
%of distorted elements (Jacobian)	0
Time to complete the mesh (hh:mm:ss)	00:00:07
Computer name	Mari Cruz



STUDY RESULTS

Name	Type	Mín.	Máx.
Amplitud1	AMPRES: Amplitud resultante Plot para forma modal: 1 (Factor de carga = 0.315477)	0.000e+000 Nodo: 904	2.953e-003 Nodo: 236

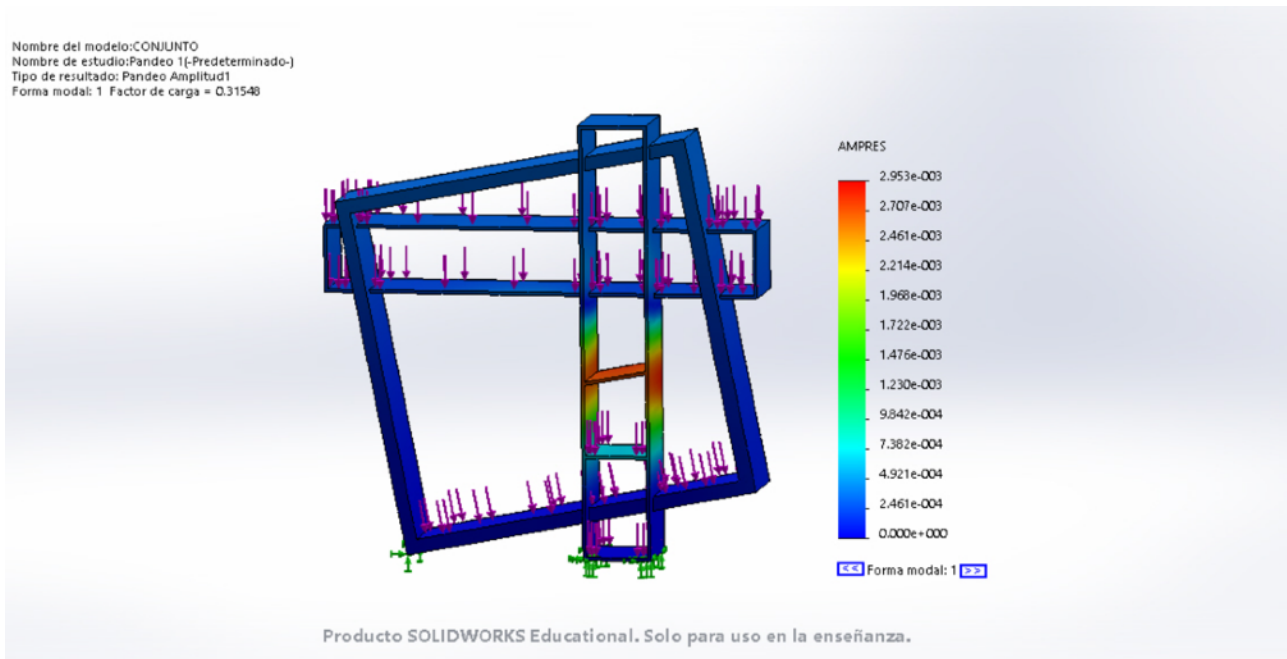
Nombre del modelo: CONJUNTO
 Nombre de estudio: Pandeo 1 (-Predeterminado-)
 Tipo de resultado: Pandeo Amplitud1
 Forma modal: 1 Factor de carga = 0.31548



Producto SOLIDWORKS Educational. Solo para uso en la enseñanza.

NODES LIST

Modo n°.	Factor de carga
1	0.31548



In the study we can conclude that the structure can withstand up to 300Kg perfectly, and the area that most damaged can be the shelf that is rotated.

1.11 CONCLUSION

As explained in the previous sections, and at the discretion of the project team, the design is viable, so it can move to the preliminary design phase.

2.1 MARKET STUDY


In this section a selection of 25 libraries that already exist in the current market is shown.

The bookstores are accompanied by a table with a series of characteristics and their respective photographs.



MODEL	KidKraft
COMPANY	bebe2go
WEB	https://www.bebe2go.com/products/librero-y-sillon-natural-1
DESIGNER	———
DIMENSIONS	Height: 57,15 cm Width: 101,6 cm Deep: 30,48 cm
PRICE	124,58 €
MATERIAL	MDF (wood)
FUNCTIONS	Chair and bookcase.
CHARACT.	It has 6 spaces to put books. Weight: 35 Kg

Market study

MODEL	The cave	
COMPANY	Biketjanst / 2010 (2004)	
WEB	http://www.sakurah.net/collections/cave-08.html	
DESIGNER	Sakura Adachi	
DIMENSIONS	Height: 155 cm Width: 255 cm Deep: 60 cm	
PRICE	6823€ (page BK library)	
MATERIAL	Wood Wool upholstery (31 colors available) Reading light (LED-spot)	
FUNCTIONS	Shelving for books, reading corner and can serve as a separator of environments.	
CHARACT.	It provides a private reading space within its form, since the height of the seat is just above the floor, and gives the feeling of being hidden from those around it.	

Market study




MODEL	Ransa sofa bookcase
COMPANY	Younes Duret Design
WEB	http://younesdesign.com/en/portfolio/ransa-comme-sur-un-nuage/
DESIGNER	Younes Duret
DIMENSIONS	Height: 140 cm Width: 180 cm Deep: 87 cm
PRICE	5800 €
MATERIAL	Structure: melamine metal Pillow: stain-free cloth.
FUNCTIONS	Sofa, library.
CHARACT.	Solid and light piece at the same time. For 2 persons Volume approx. of 70 books.

Market study



MODEL	Ella and Theo
COMPANY	BK library interiors
WEB	https://www.bklibrary.com/book-browsers/ella-and-theo
DESIGNER	_____
DIMENSIONS	Height: 410/600/940 mm Width: 600/750 mm Deep: 300/600/750 mm
PRICE	377 €
MATERIAL	Lacquered wood
FUNCTIONS	Library and armchair
CHARACT.	Thanks to its dimensions, you can create combinations in all possible directions to obtain creative and fun storage in a small space.

Market study

MODEL	The bookinist chair	
COMPANY	Smow	
WEB	https://www.smow.com/products/seating/sofa-and-armchairs/bookinist.html	
DESIGNER	Nils Holger Moormann	
DIMENSIONS	Height: 78.5 cm (with lamp: 100 cm) Width: 75 cm Deep: 91 cm	
PRICE	2642 €	
MATERIAL	Structure: birch plywood Cushion: felt	
FUNCTIONS	Mobile armchair and bookstore.	
CHARACT.	It is mobile and includes a reading lamp and a secret compartment in the armrest that has markers, pencils, notebook and a magnifying glass.	

Market study

MODEL	Bibliochaise Armchair
COMPANY	Nobody & Co.
WEB	http://www.nobodyandco.it/?page_id=7727
DESIGNER	Timorous Beasties
DIMENSIONS	Height: 74 cm Width: 101 cm Deep: 84'5 cm
PRICE	5627,69 €
MATERIAL	Structure: wood Seat: skin
FUNCTIONS	Library and armchair
CHARACT.	Volum aprox. de 300 libros



Market study




MODEL	The Paciocco Chair
COMPANY	Punto Soave
WEB	_____
DESIGNER	Carlotta Simoncello Bordignon y Tomas Bordignon
DIMENSIONS	Height (seat): 90 cm Width (seat): 120 cm Deep: 120 cm
PRICE	Prototype
MATERIAL	Structure: Solid ash wood Seat: cotton
FUNCTIONS	Armchair.
CHARACT.	Suspended seat that imitates the emotion of lying in a hammock. Structure without screws or glue.

Market study



MODEL	Bookseat
COMPANY	Fishbol Design Studio
WEB	http://www.fishtnk.com/category/multi-purpose/
DESIGNER	Elie Nehme and Mani Mani (Fishbol Design Studio)
DIMENSIONS	Height: 92 cm Width: 84 cm Deep: 60 cm
PRICE	810 €
MATERIAL	Glued plywood
FUNCTIONS	Armchair and bookstore.
CHARACT.	Useful in public places, for example, in reception offices or hospital corridors. Weight: 15 Kg, 33 LBS

Market study


MODEL	Sunflower Chair	
COMPANY		
WEB		
DESIGNER	He Mu y Zhang Qian	
DIMENSIONS	— — —	
PRICE	Prototype	
MATERIAL	Structure: metal Seat: leather	
FUNCTIONS	Library and armchair.	
CHARACT.	The sunflower-inspired chair incorporates a bookcase that fan around its padded center, providing petals of astonishment in 360 degrees	

Market study

MODEL	Dandola
COMPANY	MADE
WEB	http://www.made75.com/sieges_1_dondola_siege_dondola.html?lang=2
DESIGNER	Pucci de Rossi
DIMENSIONS	Height: 83 cm Width: 52 cm Deep: 132 cm
PRICE	— — —
MATERIAL	Stainless steel
FUNCTIONS	Rocking chair with storage boxes.
CHARACT.	By storing the books under the seat, you can alter the balance of the Dondola and configure it the way you want.



Market study

MODEL	The motion	
COMPANY	KamKam	
WEB	http://ww1.kam-kam.org	
DESIGNER	Hyunjin Seo	
DIMENSIONS	— — —	
PRICE	— — —	
MATERIAL	Lacquered wood	
FUNCTIONS	Bookcase, armchair, room divider and rocking chair	
CHARACT.	This design saves space and materials that would otherwise be used for two separate pieces of furniture.	

Market study

MODEL	Rocking bookshelf
COMPANY	Ifsodoso
WEB	http://ifsodoso.com/design%20work/3d/long%20-%20form%20-%20library.html
DESIGNER	Thomas Mills
DIMENSIONS	Diameter: 246 cm Base width: 100 cm
PRICE	10.829,46 €
MATERIAL	Varnished plywood
FUNCTIONS	Library, room separator and reading area
CHARACT.	The piece is designed to allow a "soft and steady roll" Volume approx. of 400 books.




Market study

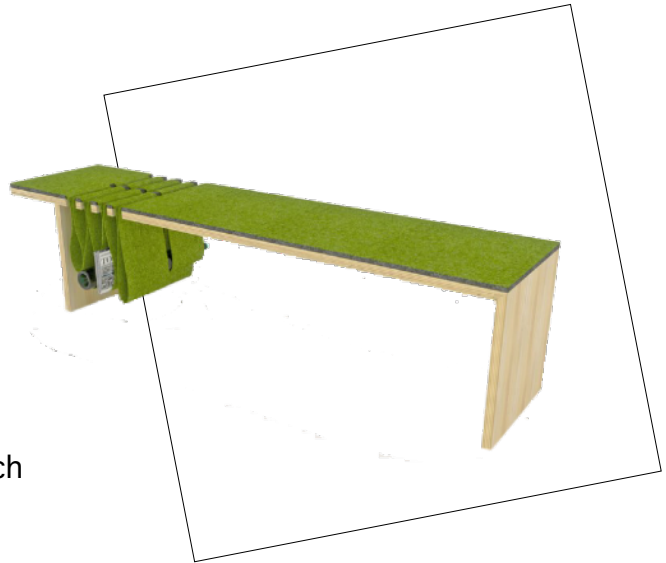
MODEL	Ofo chair
COMPANY	Solovyov Design studio
WEB	http://solovyovdesign.by/en/portfolio/furniture/?group_id=98
DESIGNER	Igor Solovyov
DIMENSIONS	— — —
PRICE	— — —
MATERIAL	Fused glass fiber
FUNCTIONS	Armchair
CHARACT.	Colors combinable with each other



Market study

MODEL	Shelf	
COMPANY	Campeggi SRL	
WEB	http://www.campeggisrl.it/it/prodotti/shelf	
DESIGNER	YOY	
DIMENSIONS	Back height: 100 cm Width: 90 cm Depth: 98 cm	
PRICE	764 €	
MATERIAL	Structure: bilaminate wood Seat: padded covered in polyester fabric	
FUNCTIONS	Armchair and bookshelf.	
CHARACT.	Comfortable and cozy, invites you to relax surrounded by the most popular objects.	

Market study



MODEL	Double-Dip Bench
COMPANY	Fishtnk
WEB	http://www.fishtnk.com/category/multi-purpose/
DESIGNER	_____
DIMENSIONS	Height: 43'2 cm Width: 152'4 cm Deep: 35'56 cm
PRICE	1465 €
MATERIAL	Structure: Birch wood Cushion: 100% carbonized felt wool
FUNCTIONS	Bench and magazine rack
CHARACT.	Different sizes

2.2 MOODBOARD

The moodboards are excellent for consolidating a theme or concept for an interior space. It is an excellent way to test ideas before executing them.

Here are some ideas:

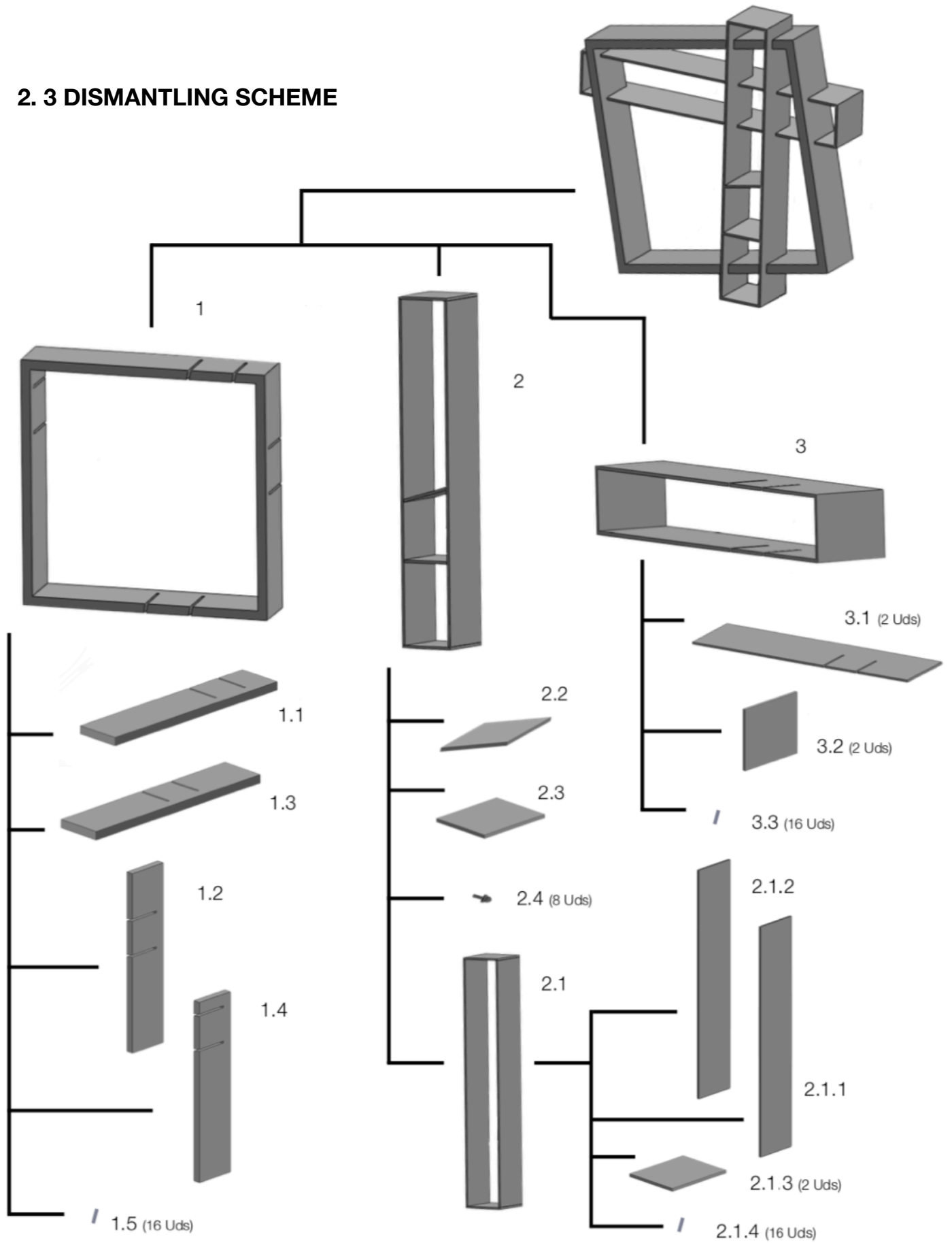
For a rustic atmosphere, the CUBE walnut bookcase combined with aged metal elements and dry decoration branches, even some white marble to give a touch of light to the habitat, would be perfect.



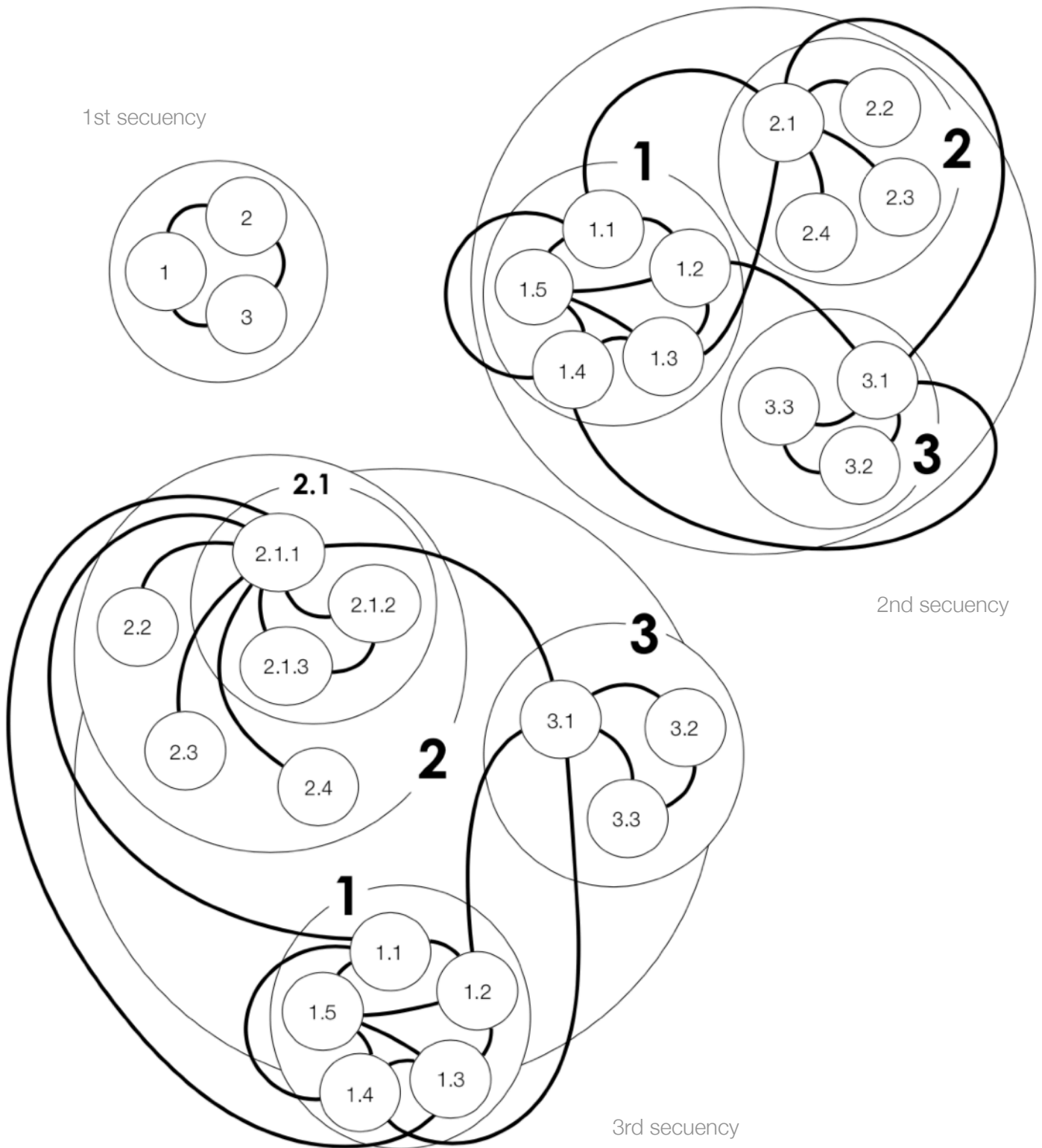
If you want a warmer environment, the CUBE Oak bookcase is perfect to combine with tropical prints and bright colors, which together with vegetation will give a fresh air to the room.



2.3 DISMANTLING SCHEME



2. 4 SYSTEMIC DIAGRAM



2. 5 APPENDICES OF MEASUREMENTS AND BUDGET

For the correct realization of the MEASUREMENTS AND BUDGETS section, information is required on the operations to be carried out, that is, costs of machinery, tools, material and labor.

Operations to consider:

- Straight cut
- Edging
- Glued
- Machining
- Sanding
- Lacquered
- Gluing
- Flat pressing
- Elimination of impurities

According to the information provided by the companies, the costs of the raw material, machinery, tools and tools used, as well as labor, are the following:

Raw material:

- Chipboard veneered in Walnut 2200x1220 x11mm = **18'31 €/m²**
- Chipboard veneered in Oak 2200x1220x11mm = **12'47 €/m²**
- Strips of pine for sheeting 2100x58x34mm = 2'5 € / m = **5'25 €/Ud**
- Board agglomerated DM 2750x1220x25mm = **7'66 €/m²**

Machinery:

- Panel saw TECTRA 6120 CLASSIC = 60000 € - Amortizable in 10 years = **2'05 €/h**
- Edge crimper SPRINT 1329 = 85000 € - Amortizable in 10 years = **3 €/h**
- CNC EVOLUTION 7405 4MAT = 74000 € - Amortizable in 10 years = **2'53 €/h**
- Veneer press LEOPIDA = 27000 € - Amortizable in 10 years = **0.92 €/h**
- Paint pump = € 3500 - Amortizable in 5 years = **0.25 €/h**

* Amortization supposed for 8h of daily work.

Tools:

- Drill Ø 8 = € 25 - useful life 1000 holes = **0'025€**
- Drill Ø12 = € 25 - useful life 1000 holes = **0'025€**
- Flat drill Ø15 = € 30 useful life 800 holes = **0'038€**
- Saw blade for woods = € 23 - Useful life of 500 h = **0.046 €/h**
- Eccentric sander GEX 150 = 392'04 € - Amortizable in 2 years = **0'067€/h**
- Magnetic tip screwdriver = **1'83 €**
- Plastic pre-sealing machine = **11'43 €**

Tools:

- Seal = € 1 / 48m = **0.02€/m**
- White tail = **0.14€/m²**
- Glue adhesive = **1'1€/m²**
- 80mm Walnut Ridge = **0'8€/m**
- Oak Ridge 20mm = **0.36€/m**
- Lacquered paint = € 9 / L = **0.6€/m²**
- Bubble paper = € 82'5 / 75m = **1'1€/m**
- Film paper = € 128 / € 160m = **0.8€**

Commercial elements:

- Wooden dowels Ø8 x 30mm = 0.73 €/100Uds = **0.007 €/Ud**
- Wooden dowels Ø12 x 60mm = 3'14 €/100Uds = **0.031 €/Ud**
- Hettich Eccentric Ø15mm = 48.7 €/200Uds = **0.244 €/Ud**
- Leveling foot Ø10 x 38mm = **0.60 €/Ud**
- Support shelf with suction cup = 17'15 €/100Uds = **0'171€/Ud**

Workforce:

- Official 1a = **30€/h**
- Official 2a = **25€/h**
- Official 3a = **20€/h**

2. 6 COMMERCIAL ELEMENTS

In this section you can find the following elements:

RASTEX 15 UNCENTRIC UNION ASSEMBLY



HETTICH Group

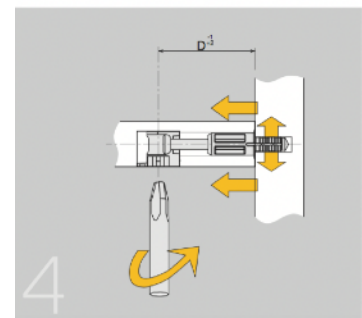
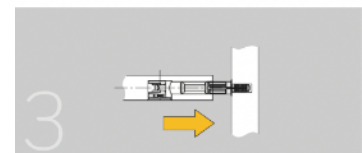
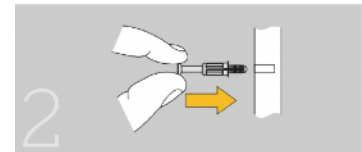


TWISTER

- ▶ With clamping device: the furniture sides can thus be attracted up to a distance of 4 mm from the front side of the shelf.
- ▶ Double safety by internal and external teeth. The screw is always tightened centered and in this way an erroneous assembly of the pieces of furniture is avoided.
- ▶ The eccentric can be tensioned with a flat screwdriver, cross-shaped PZ 3 or an Allen wrench (SW) 4.
- ▶ With and without flange, the flange covers impure drills; no additional cover is required
- ▶ Drill bits for column and manual drilling machines
- ▶ Zamak



RASTEX 15



MONTAJE

Twister: fast and safe assembly.

With the freewheel bushing, the Twister can be guided safely to the stop during the entire screwing operation with the battery-powered screwdriver. In this way, danger of injury to sharp edges and burrs is avoided.

MOUNTING

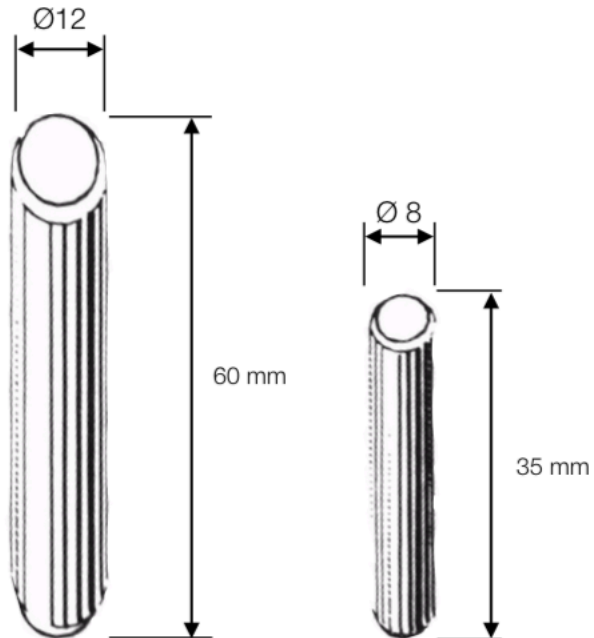
When the eccentric rotation is made, the rod moves, simultaneously expanding the part that remains lodged in the side. This achieves a strong and effective interlocking.

Acabado	Código / Para grosor de tablero mm					U.E.
	15	16	19	22	29	
niquelado	0 079 451	0 071 948	0 071 950	0 071 952	0 079 478	1/200 uds.
niquelado	0 079 452	0 073 459	0 073 460	0 073 461	0 079 479	2000 uds.

BEECH WOOD SPIKE

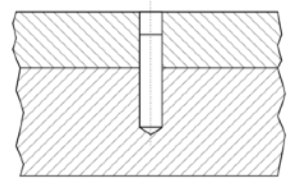







VERDÚ Group



MOUNTING

First the two elements to be assembled are bored, then the pin is inserted and secured in both holes with glue or a needle nail.

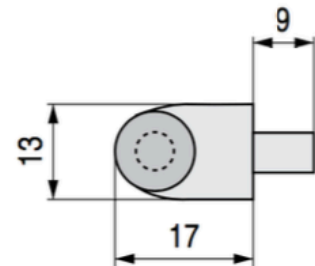
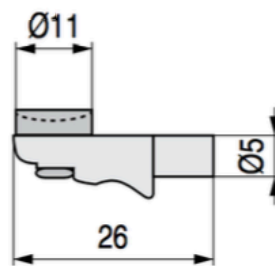
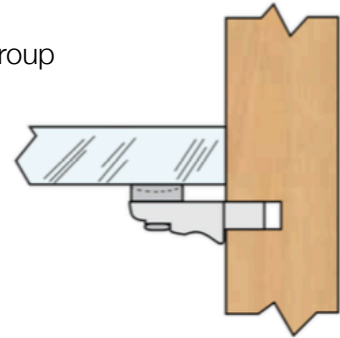


NORMALS (MANUAL PLACEMENT)									
BILLING PER UNIT, MINIMUM ONE BOX									
									
	L Length in mm.	Thick Ø6		Thick Ø8		Thick Ø10		Thick Ø12	
		Code	 Units	Code	 Units	Code	 Units	Code	 Units
	20			984.53	6.900	984.60	4.600		
	25	984.74	9.300	984.54	6.000	984.61	3.700		
	30	984.75	6.800	984.55	4.300	984.62	2.900	984.68	2.100
	35	984.76	6.100	984.56	3.600	984.63	2.500	984.69	1.900
	40			984.57	3.000	984.64	2.200	984.70	1.500
	45			984.58	2.400	984.65	1.600	984.71	1.300
	50			984.59	2.100	984.66	1.500	984.72	1.150
	60					984.67	1.200	984.73	900

- Billing per unit, minimum one box

VENTO SHELF SUPPORT WITH SUCTION CUP

VERDÚ Group



- With drill stem Ø5

CODE

Material

Finish

**70.7**

zamak

níquel

500

70.24

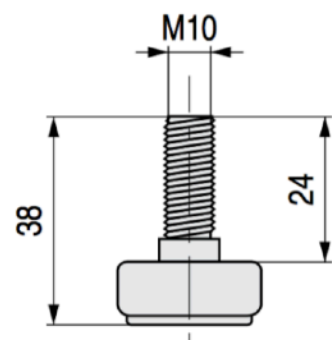
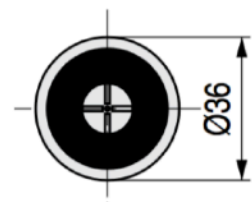
zamak

bronce

500

SOHO LEVELER

Group VERDÚ



- With square to facilitate regulation by means of a key ja.

CODE

Material

Finish

**292.23**

hierro-plástico

cromo-negro

300

2. 7 MACHINES FOR MANUFACTURE

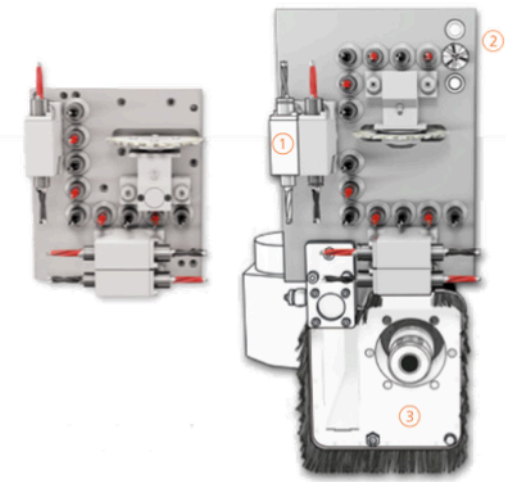
In this section you can find the following elements:

CNC **EVOLUTION 7405** 4MAT → HOLZ-HER Group

The EVOLUTION series offers unique solutions with patent applied for the complete machining of your work pieces. Well thought-out, distinguished industrial design and excellent stability structure.

Drilling head with complete equipment

- ① Double spindle with additional drilling in Y direction
- ② Vertical adapter with double positioning force
- ③ Milling spindle



This is what it offers:

- CAMPUS V7 control of the machines
- Aggregate drilling module and standard milling
- It is unique! Complete machining
- Unique fixation concept
- Precise direct drives
- Broad access

HORIZONTAL SECTIONER TECTRA 6120 CLASSIC → HOLZ-HER Group

Thanks to these high values of acceleration and speed of feeding, the TECTRA 6120 can even process large quantities of panels in a rational way. This versatile saw is available with various cutting lengths and cutting widths, allowing its adaptation in very varied applications as a customized solution.

This is what it offers:

- Protrusion of the blade of the saw up to 82 mm
- Aggregate sawing module up to 11 kW
- Cutting lengths up to 4,400 mm
- Cutting widths up to 4,300 mm



BINDER OF CANTOS **SPRINT 1329**



HOLZ-HER Group

The SPRINT 1329 provides a multifunctional technology at the highest level. Motorized adjustable shafts are used for the complete machine. With this, HOLZ-HER allows a precise change with a single button without opening the cover of the machine.



This is what it offers:

- Invisible joints resistant to water
- Glu Jet automatic
- Simple manipulation, high flexibility
- Milling technique at the highest level
- Variable feedrate up to 18 m / min.

PRESS OF ENCHAPAR LEOPIDA



Group CATAVORELLO



- The new version of the SCM GS presses are oriented for panels, doors and furniture.
- They guarantee the planarity and precision.
- Flexibility of pressing for any type of material thanks to electronic programming.
- Durability in time of the work planes.

AIRMIX KREMLIN PAINT PUMP



F.S. SILVA Group

- Cycle ratio: 10/1
- Number of cycles per liter: 55
- Volume of product per cycle: 18cm³
- Air supply pressure more: 6bar
- Max. of fluid: 6th



INDUSTRIAL AIR COMPRESSOR



URREA Group

URREA Industrial Air Compressor 500lt 5HP 220 / 440V 3 Phases Extra Heavy Use - COMP9505 660731651713

- MAXIMUM PRESSURE: 12 bar (175 psi)
- FLOW AT 150 PSI: 18 CFM
- PHASES: 3
- WEIGHT: 300 kg
- POWER: 5 HP
- COLOR: Black
- VOLTAGE: 220/440 V
- NUMBER OF STAGES: 1
- MATERIAL: Metal
- 90 PSI FLOW: 22 CFM
- FREQUENCY: 60 Hz



2. 8 TOOLS AND USEFUL FOR ASSEMBLY

In this section you can find the following elements:

MAGNETIC SCREWDRIVER **CUSHIONGRIP** →

- PHILLIPS tip
- Ergonomic cushioned handle
- 100mm long bar resistant to corrosion.

STANLEY Group



BALL HAMMER → STANLEY Group

- Curved Ball Hammer
- Weight Head: 32 OZ
- Material Head: Polished Carbon Steel
- Weight: 2 Kg



2. 9 PRODUCT POSTER



3

MEASUREMENT AND BUDGET

3.1 BUDGET

The following is the budget corresponding to the manufacture of the furniture according to the realization of the prototype (see the starting data in section 2.7 of ANNEXES):

For the preparation of the MEASUREMENT AND BUDGET chapter, information is needed on the duration and cost of jobs, machinery and tools.

UNIT OF WORK	MEASUREMENT		DESCRIPTION	UNITY PRICE (€/UD.)	IMPORT (€)	TOTAL (€)
	Quant.	Ud.				
SUBSET 1	4	Ud.	LATERALS			
	1'89	m2	Material: • Agglomerated veneered board in Walnut of 2200 x 1220 x 11mm • Pine strips 2100 x 58 x 34mm	18,31	34,60	
	4	Ud		5,25	21	222,4
	1'89	m2	Material: • Agglomerated veneered in Oak 2200 x 1220 x 11mm • Pine strips 2100 x 58 x 34mm	12,47	23,568	
	4	Ud		5,25	21	115,3
			<u>WORK OF: CUTTING BOARD</u>			
	0,2	h	Machinery: sectioning machine	0,125	0,025	
	0,167	h	Workforce: Official 1st	30	5	
	510	m	Auxiliary means: Saw disc	0,046	23,46	28,49
			<u>WORK OF: ENTOLBORADO GLUING</u>			
	0,267	h	Machinery: - - - Workforce: Official 2nd	25	6,667	
	8,4	m	Auxiliary means: Gluing glue	1,1	9,333	16
			<u>WORK OF: PRESSING</u>			
	0,5	h	Machinery: Veneer press	0,92	0,46	
	0,167	h	Workforce: Official 2nd Auxiliary means: - - -	25	4,175	4,635
			<u>WORK OF: EDGING</u>			
	0,116	h	• Clean up edges Machinery: Edgebander	3	0,348	
0,5	h	Workforce: Official 1st	30	15		
5,30	m	Auxiliary means: Walnut edge 80mm	0,8	4,24		
5,10	m	Gluing glue	1,1	5,61	25,198	

UNIT OF WORK	MEASUREMENT		DESCRIPTION	UNITY PRICE (€/UD.)	IMPORT (€)	TOTAL (€)	
	Quant.	Ud.					
SUBSET 1	0,167	h	<u>WORK OF: MACHINING</u>	2,53	0,423		
	0,167	h	Machinery: CNC	30	5		
	8	Ud	Workforce: Official 1st	0,025	0,2		
	4	Ud	Auxiliary means: Drill Ø12	0,038	0,152	5,772	
			Drill Ø15				
			<u>WORK OF: SURFACE FINISH</u>				
	1	h	Machinery: Paint pump	0,25	0'25		
	0,5	h	Air compressor	1,027	0,513		
	0,5	h	Eccentric sander	0,067	0,035		
	1	h	Workforce: Official 2nd	25	25		
	0,5	h	Official 3rd	20	10		
	2,31	m2	Auxiliary means: Colorless paint	0,6	1,386		
	2,31	m2	Sandpaper	0,0075	0,017	37,199	
			<u>WORK OF: PACKAGING</u>				
	0,2	h	Machinery: - - -	25	5		
	2,31	m2	Workforce: Official 3rd	1,1	2.541		
	2,31	m2	Auxiliary means: Bubble paper	0,8	1,848		
	3	m	Papel film	0,02	0,06	9,449	
			Tape				
	TOTAL SUBSET 1 FINISHED WALNUT						349,143 €
	TOTAL SUBSET 1 FINISHED OAK						242,043 €

UNIT OF WORK	MEASUREMENT		DESCRIPTION	UNITY PRICE (€/UD.)	IMPORT (€)	TOTAL (€)
	Quant.	Ud.				
SUBSETS 2 & 3	4	Ud.	LATERALS			
	1,148	m2	Material: • DM chip board 2750 x 1220 x 25mm <u>WORK OF: CUTTING BOARD</u>	7,66	8,789	35,156
	0,2	h	Machinery: sectioning machine	0,125	0,025	
	0,167	h	Workforce: Official 1st	30	5	
	510	m	Auxiliary means: Saw disc	0,046	23,46	28,49
			<u>WORK OF: MACHINING</u>			
	0,167	h	Machinery: CNC	2,53	0,423	
	0,167	h	Workforce: Official 1st	30	5	
	8	Ud	Auxiliary means: Drill Ø12	0,025	0,2	
	4	Ud	Drill Ø15	0,038	0,152	5,772
			<u>WORK OF: SURFACE FINISH</u>			
	1	h	Machinery: Paint pump	0,25	0,25	
	0,5	h	Air compressor	1,027	0,513	
	0,5	h	Eccentric sander	0,067	0,035	
	1	h	Workforce: Official 2nd	25	25	
	0,5	h	Official 3rd	20	10	
	1,14	m2	Auxiliary means: Colorless paint	0,8	0,912	
	1,14	m2	Sandpaper	0,0075	0,0085	36,719
			<u>WORK OF: PACKAGING</u>			
	0,2	h	Machinery: - - - Workforce: Official 3rd	25	5	
	2,31	m2	Auxiliary means: Bubble paper	1,1	2.541	
	2,31	m2	Papel film	0,8	1,848	
	3	m	Tape	0,02	0,06	9,449
		TOTAL LATERALES				

UNIT OF WORK	MEASUREMENT		DESCRIPTION	UNITY PRICE (€/UD.)	IMPORT (€)	TOTAL (€)	
	Quant.	Ud.					
SUBSETS 2 & 3	4	Ud.	COVERS				
	0,18	m2	Material: • DM chip board 2750 x 1220 x 25mm <u>WORK OF: CUTTING BOARD</u>	7,66	1,379	5,51	
	0,116	h	Machinery: sectioning machine	0,125	0,015		
	0,116	h	Workforce: Official 1st	30	3,48		
	510	m	Auxiliary means: Saw disc	0,046	23,46	26,955	
	0,5	h	<u>WORK OF: SURFACE FINISH</u> Machinery: Paint pump	0,25	0,125		
	0,5	h	Air compressor	1,027	0,513		
	0,116	h	Eccentric sander	0,067	0,007		
	0,5	h	Workforce: Official 2nd	25	12,5		
	0,116	h	Official 3rd	20	2,32		
	2,31	m2	Auxiliary means: Colorless paint	0,8	1,848		
	2,31	m2	Sandpaper	0,0075	0,017	17,33	
	0,116	h	<u>WORK OF: PACKAGING</u> Machinery: - - - Workforce: Official 3rd	25	2,9		
	0,18	m2	Auxiliary means: Bubble paper	1,1	0,198		
	0,18	m2	Papel film	0,8	0,144		
	1,25	m	Tape	0,02	0,025	3,267	
	TOTAL COVERS						53,062 €

UNIT OF WORK	MEASUREMENT		DESCRIPTION	UNITY PRICE (€/UD.)	IMPORT (€)	TOTAL (€)	
	Quant.	Ud.					
SUBSETS 2 & 3	2	Ud.	SHELVES				
	0,162	m2	Material: • DM chip board 2750 x 1220 x 25mm <u>WORK OF: CUTTING BOARD</u>	7,66	1,24	2,48	
	0,067	h	Machinery: sectioning machine	0,125	0,008		
	0,067	h	Workforce: Official 1st	30	2		
	324	m	Auxiliary means: Saw disc	0,046	14,904	16,912	
			<u>WORK OF: SURFACE FINISH</u>				
	0,333	h	Machinery: Paint pump	0,25	0,08		
	0,5	h	Air compressor	1,027	0,513		
	0,067	h	Eccentric sander	0,067	0,004		
	0,5	h	Workforce: Official 2nd	25	12,5		
	0,116	h	Official 3rd	20	2,32		
	2,31	m2	Auxiliary means: Colorless paint	0,8	1,848		
	2,31	m2	Sandpaper	0,0075	0,017	17,282	
			<u>WORK OF: PACKAGING</u>				
	0,116	h	Machinery: - - - Workforce: Official 3rd	25	2,9		
	0,18	m2	Auxiliary means: Bubble paper	1,1	0,198		
	0,18	m2	Papel film	0,8	0,144		
	1,25	m	Tape	0,02	0,025	3,267	
	TOTAL SHELVES						39,941 €

TOTAL WALNUT LIBRARY

557,736 €

TOTAL OAK LIBRARY

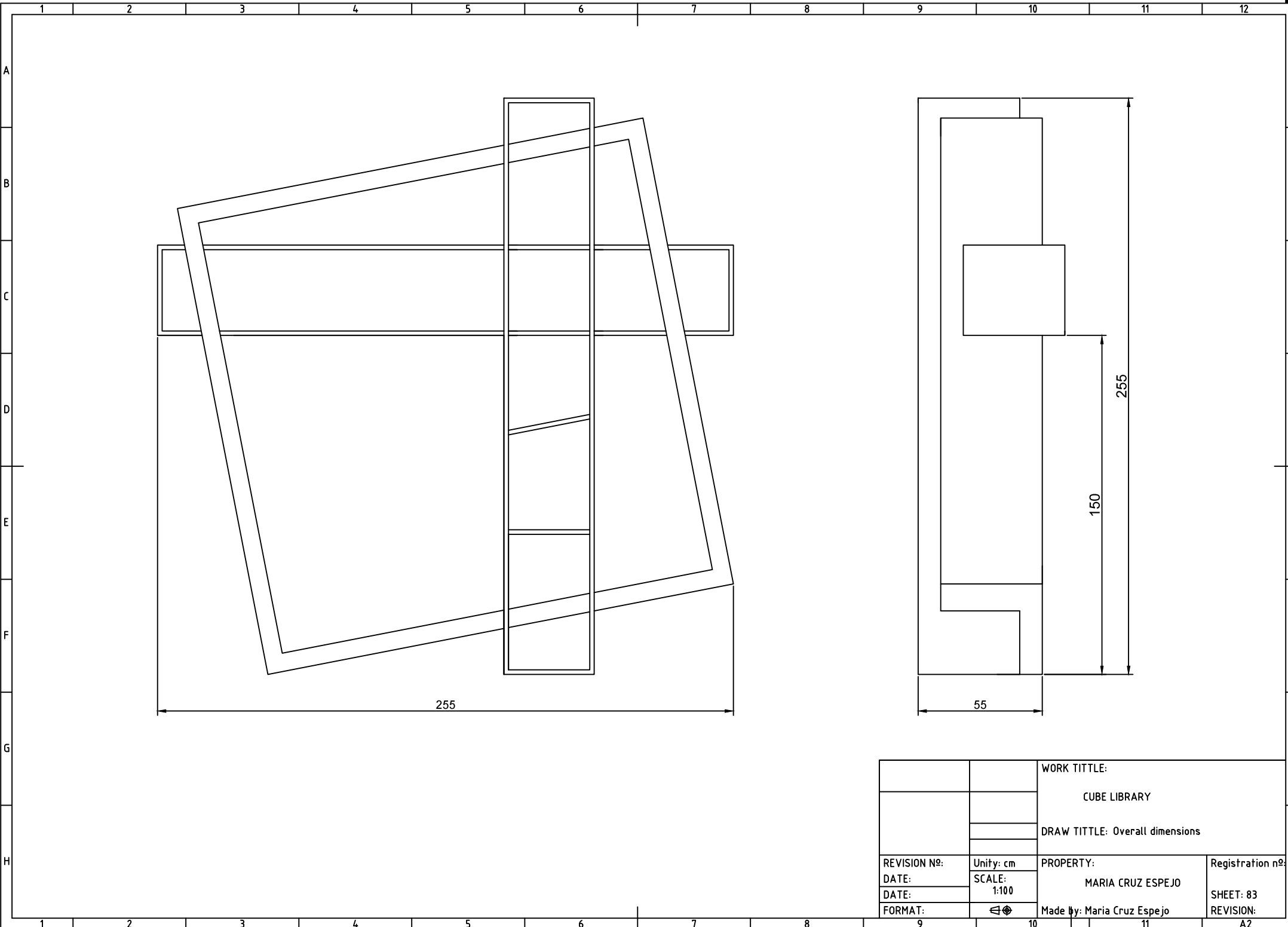
450,636 €



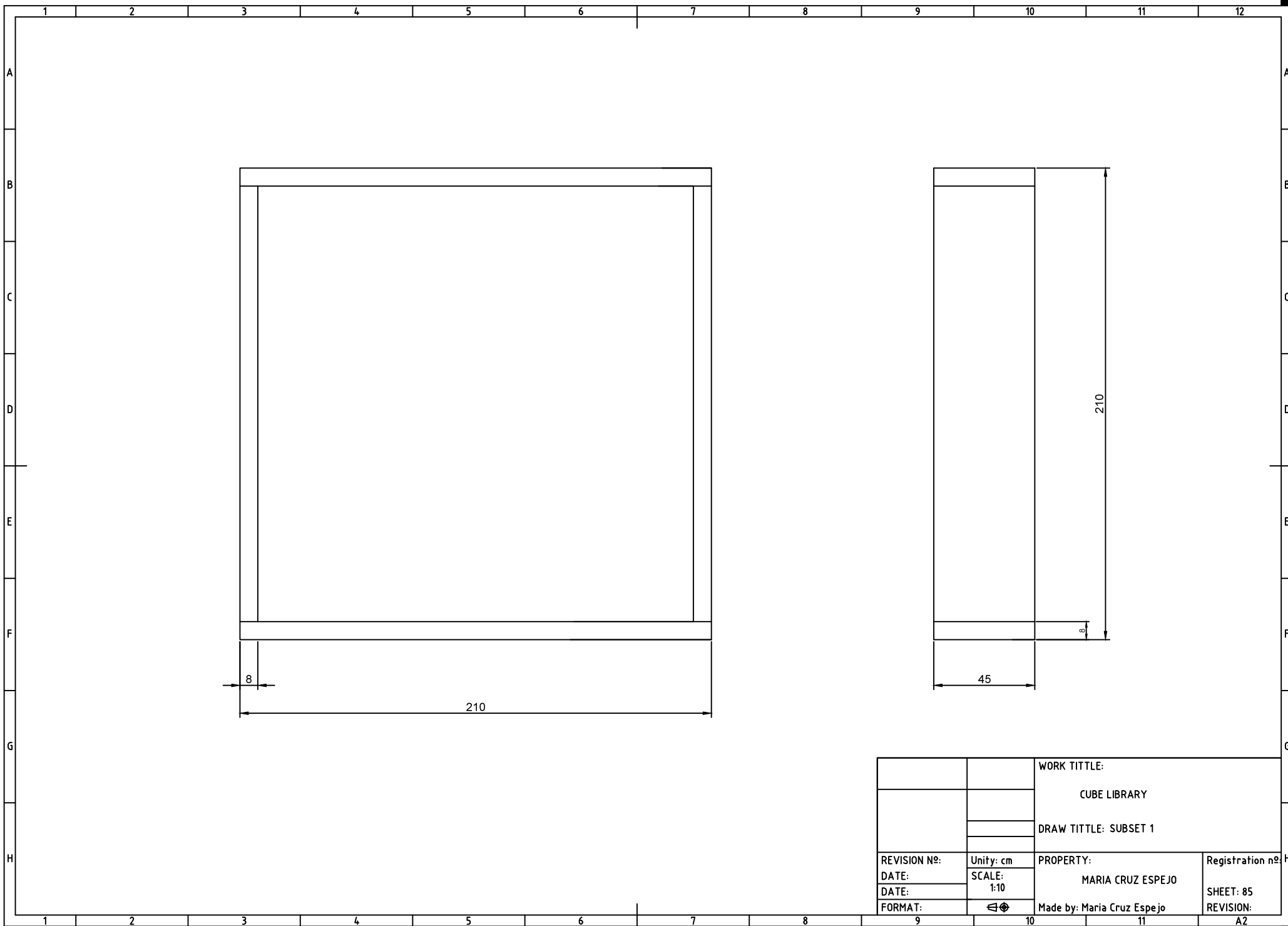
PLANS

4.1 INDEX OF PLANS

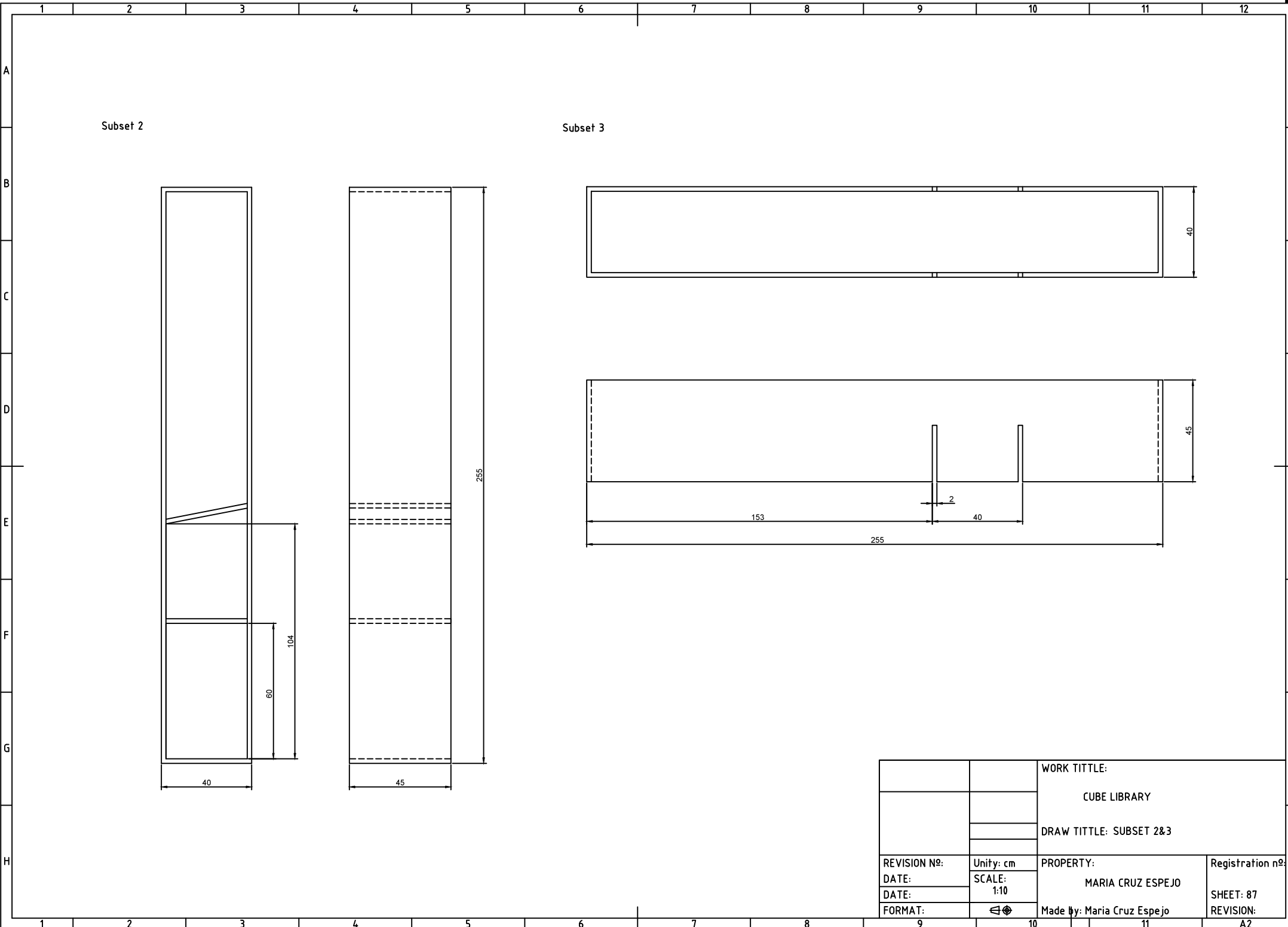
ASSEMBLY DRAWING	83
SUBSET 1	85
SUBSET 2 & SUBSET 3	87
SUBSET 1 EXPLODED	89
SUBSET 2 EXPLODED	91
SUBSET 3 EXPLODED	93



		WORK TITLE:	
		CUBE LIBRARY	
		DRAW TITLE: Overall dimensions	
REVISION Nº:	Unity: cm	PROPERTY:	Registration nº:
DATE:	SCALE:	MARIA CRUZ ESPEJO	SHEET: 83
DATE:	1:100	Made by: Maria Cruz Espejo	REVISION:
FORMAT:	☞		AZ

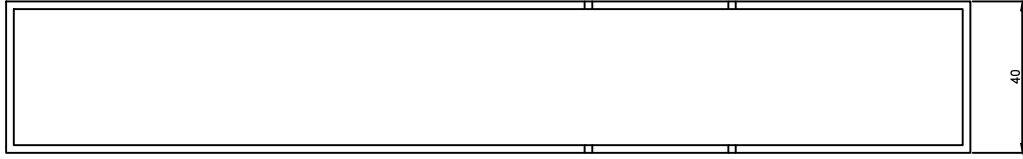
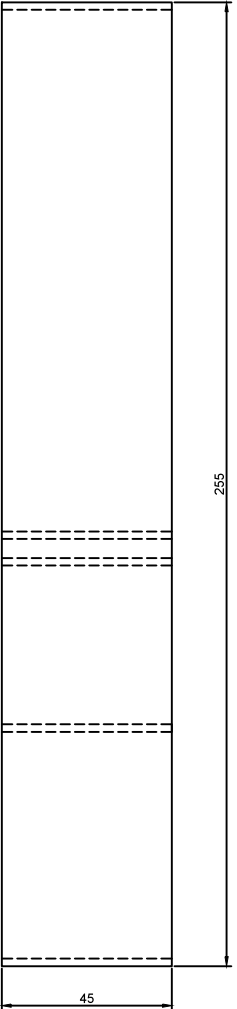
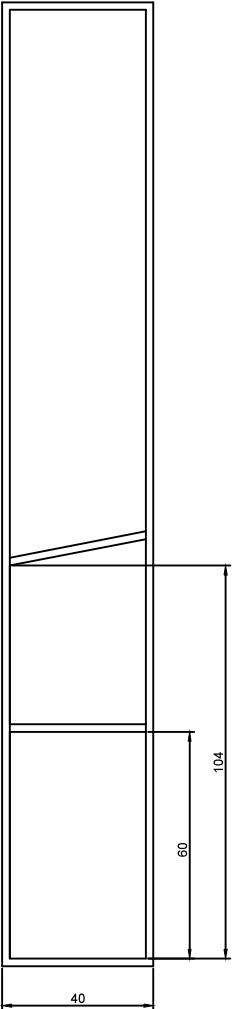


		WORK TITLE:	
		CUBE LIBRARY	
		DRAW TITLE: SUBSET 1	
REVISION Nº:	Unity: cm	PROPERTY:	Registration nº:
DATE:	SCALE:	MARIA CRUZ ESPEJO	SHEET: 85
DATE:	1:10	Made by: Maria Cruz Espejo	REVISION:
FORMAT:	◀		A2

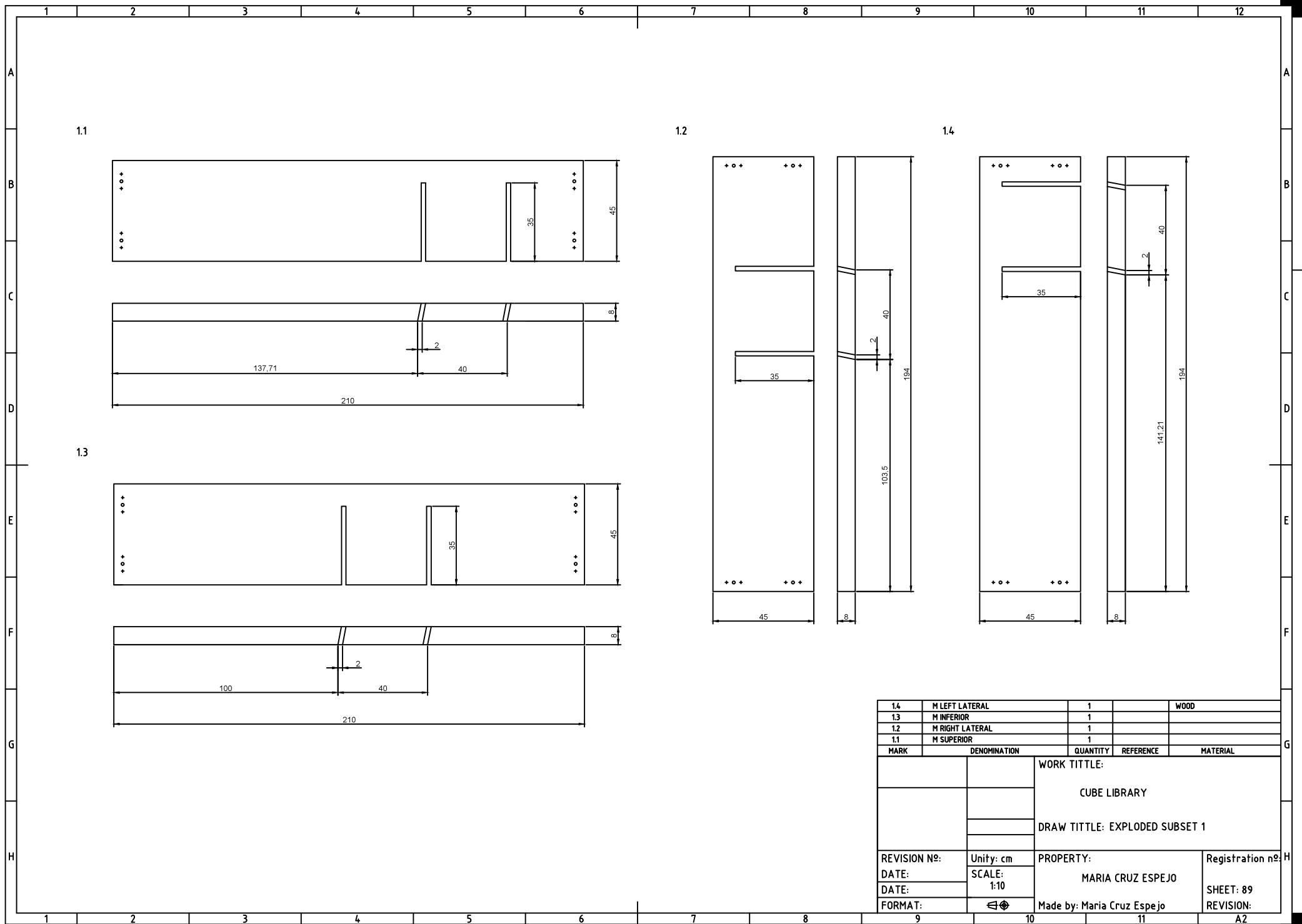


Subset 2

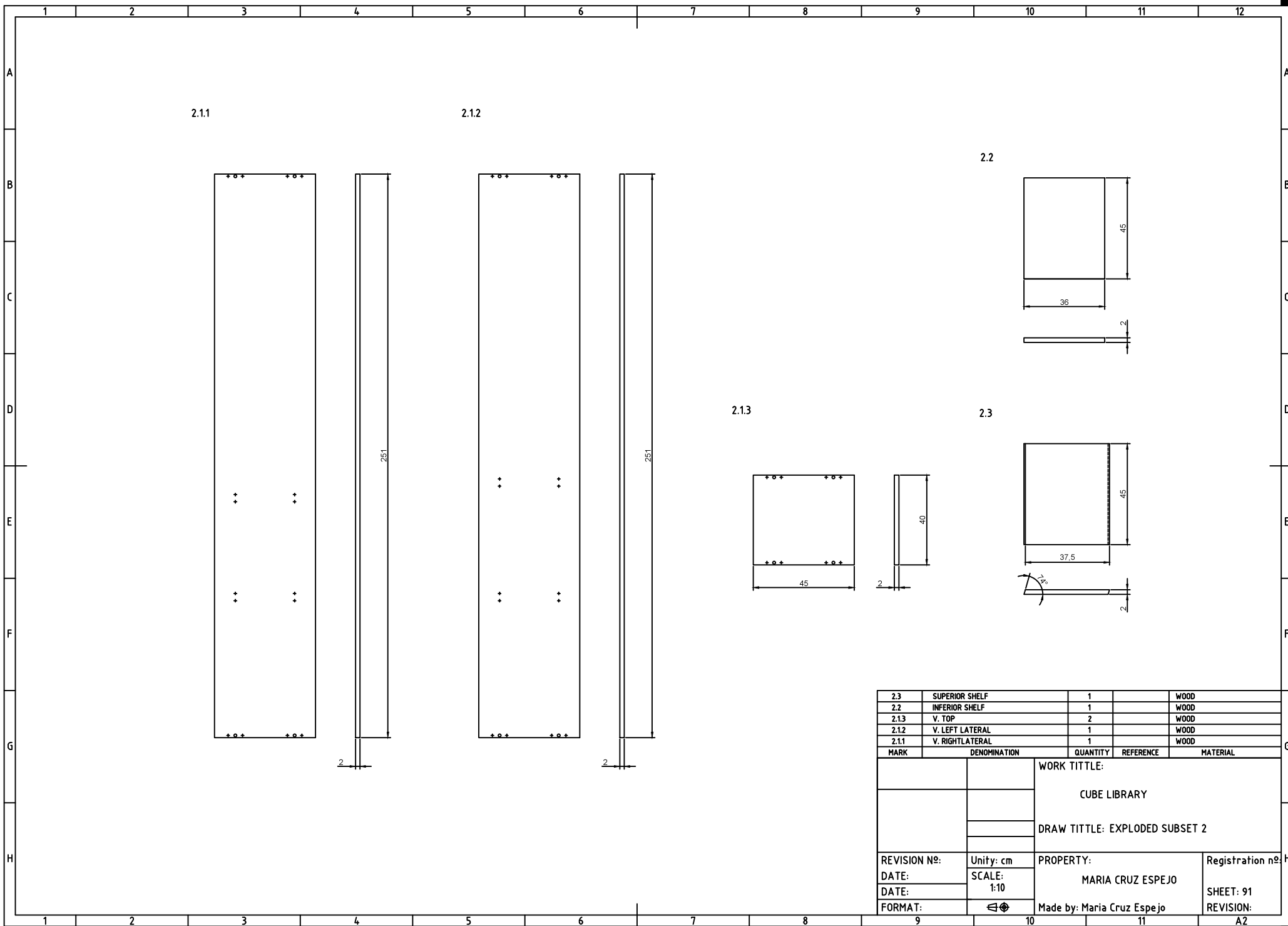
Subset 3



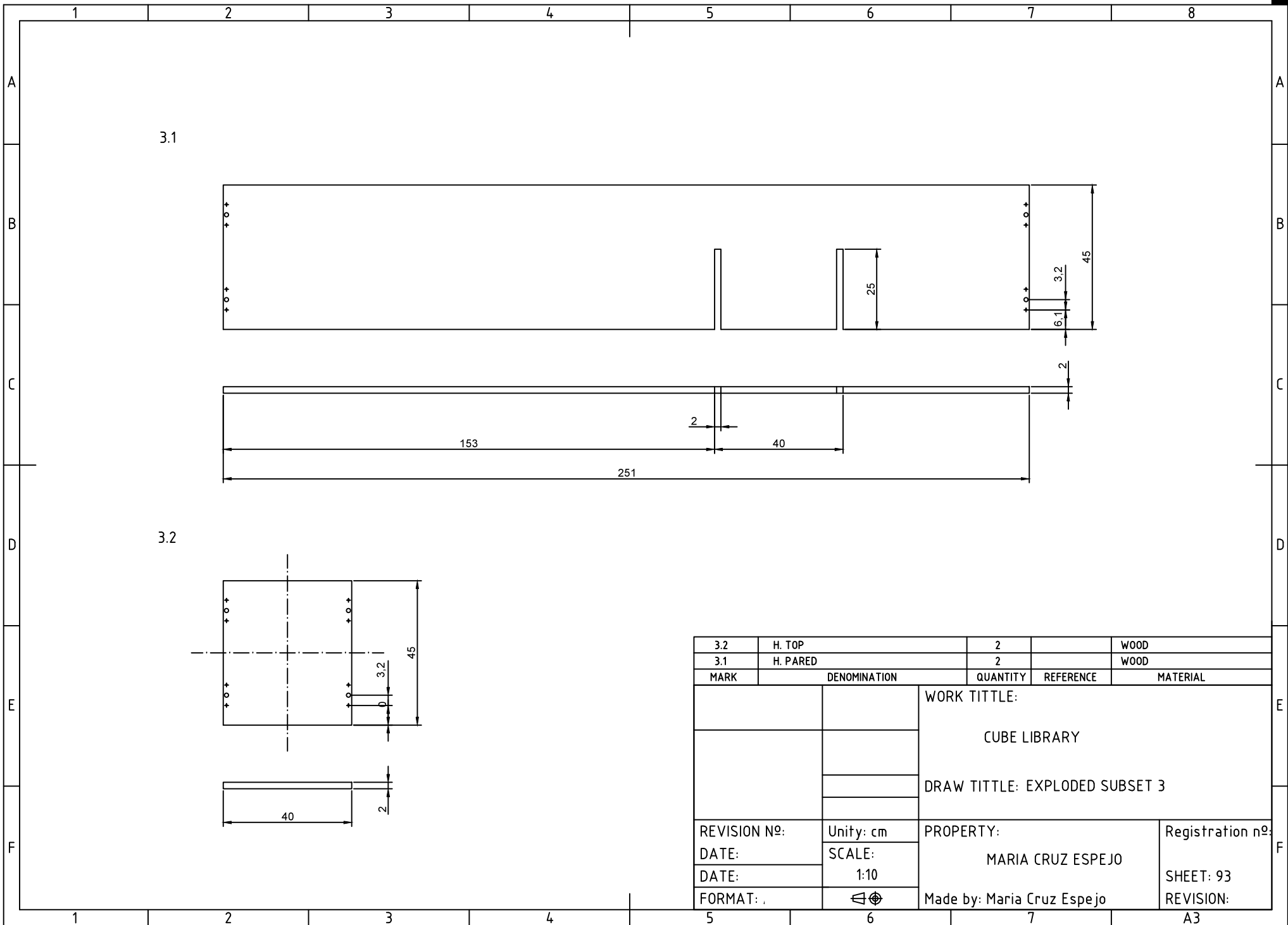
		WORK TITLE:	
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		DRAW TITLE: SUBSET 2&3	
REVISION Nº:	Unity: cm	PROPERTY:	Registration nº:
DATE:	SCALE:	MARIA CRUZ ESPEJO	SHEET: 87
DATE:	1:10	Made by: Maria Cruz Espejo	REVISION:
FORMAT:	☞		AZ



1.4	M LEFT LATERAL	1		WOOD
1.3	M INFERIOR	1		
1.2	M RIGHT LATERAL	1		
1.1	M SUPERIOR	1		
MARK	DENOMINATION	QUANTITY	REFERENCE	MATERIAL
		WORK TITTLE:		
		CUBE LIBRARY		
		DRAW TITTLE: EXPLODED SUBSET 1		
REVISION Nº:	Unity: cm	PROPERTY:		Registration nº:
DATE:	SCALE:	MARIA CRUZ ESPEJO		SHEET: 89
DATE:	1:10	Made by: Maria Cruz Espejo		REVISION:
FORMAT:	⚙			A2



2.3	SUPERIOR SHELF	1		WOOD
2.2	INFERIOR SHELF	1		WOOD
2.1.3	V. TOP	2		WOOD
2.1.2	V. LEFT LATERAL	1		WOOD
2.1.1	V. RIGHT LATERAL	1		WOOD
MARK	DENOMINATION	QUANTITY	REFERENCE	MATERIAL
		WORK TITLE:		
		CUBE LIBRARY		
		DRAW TITLE: EXPLODED SUBSET 2		
REVISION Nº:	Unity: cm	PROPERTY:		Registration nº:
DATE:	SCALE:	MARIA CRUZ ESPEJO		SHEET: 91
DATE:	1:10	Made by: Maria Cruz Espejo		REVISION:
FORMAT:	◀◆			A2



3.2	H. TOP	2		WOOD
3.1	H. PARED	2		WOOD
MARK	DENOMINATION	QUANTITY	REFERENCE	MATERIAL
		WORK TITLE:		
		CUBE LIBRARY		
		DRAW TITLE: EXPLODED SUBSET 3		
REVISION Nº:	Unity: cm	PROPERTY:		Registration nº:
DATE:	SCALE:	MARIA CRUZ ESPEJO		SHEET: 93
DATE:	1:10	Made by: Maria Cruz Espejo		REVISION:
FORMAT: .				A3

BRIEFING

<http://proyectosmobiliario.blogspot.com/2010/10/proyecto-asiento-de-carton.html>

<https://www.arturogarcia.com/el-briefing-creativo-que-es-y-como-hacer-uno/>

MATERIALS

- DM BOARD: <http://www.tablerosmartinez.com/index.php?zona=tarifas&tari=17>
- Tela: <https://telasparatapizar.com/270-visual-bellagio>
<https://www.aquaclean.com/es-es/elige-tu-tela>
- Tablero rechapado: <http://www.tablerosmartinez.com/index.php?zona=tarifas&tari=9>
- Madera aglomerado: https://www.tmolduras-fbermejo.es/files/madera_pino_silvestre.pdf
- Pino: <https://tmolduras-fbermejo.es/tienda-virtual/listones-de-madera-y-mdf/listones-de-madera->

COMERCIAL ELEMENTS

- *Excéntricas*: <https://www.indaux.com/es/productos/doc/110/1/excentrica15cast.pdf>
- *Espigas Ø12 x 60mm*: <https://verduonlinestore.com/tornilleria/6939-wooden-%20%20dowels-12-60-900u-0000098400737.html>
- *Espigas Ø8x30mm*: <https://verduonlinestore.com/tornilleria/6962-wooden-dowels-8-30-%20%20bag-20000u-1-kg-975-units-aprox--0000098400065.html>
- *Pie nivelador Ø10 x 38mm*: <https://verduonlinestore.com/herrajes-y-complementos-tapiceria/15194-soho-adjustable-leveller-m10x38mmthread-24mm-chrome-finish-0000029200238.html>
- *Soporte de estantes con ventosa*: https://verduonlinestore.com/herrajes-para-muebles/6441-vento-plug-in-shelf-support-with-rubbercap-d5mm-zinc-alloy-material-bronzefinish-8108651080005.html?search_query=SOPORTE+ESTANTE&results=671

MACHINERY

- *Canteadora Sprint*: <https://www.holzher.es/es/productos/chapadoras-de-cantos/sprint.html>
- *Centro de mecanizado*: <https://www.holzher.es/es/productos/centros-de-mecanizado-verticales/evolution/evolution-7405.html>
- *Prensa de enchapar*: <http://www.catavorello.com.ar/leopida.html>
- *Seccionadora Tectra*: <https://www.holzher.es/es/productos/seccionadoras-horizontales/zentrex-6220.html>
- *Bomba pintura*: <http://www.fss.pt/pt/produto/488/bomba-pintura-airmix-kremlin-eos-10-c18&sub=566>
- *Compresor aire*: <http://www.tienda.herramientasavi.com/producto/urrea-compresor-de-aire-industrial-500lt-5hp-220440v-3-fases-uso-extra-pesado-comp9505/>

TOOLS

- *Martillo*: https://www.traverstool.com.mx/mano_174/99-019-191.html
- *Broca plana*: http://www.cmtutensili.es/show_items.asp?pars=BB~317~2~4~4
- *Broca*: http://www.cmtutensili.es/show_items.asp?pars=TBMB~161%20HW~2~4~4#
- *Sierra*: http://www.cmtutensili.es/show_items.asp?pars=SB~2~4~4
- *Lijadora excéntrica*: <http://www.ferrovicmar.com/herramientas-electricas.asp?producto=lijadora->

