Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Scholarship 2023

Design and Visual Communication 93602

TOP SCHOLAR

SYSTEM*

DVC 2023

INSPIRATIONS

INITIATION

REVISION

DEVELOPMENT

REFINEMENT

VISUALISATION

context

In New Zealand between **100-200,000 tonnes of textile waste** is sent to landfill each year, where it can not break down but releases toxic greenhouse gases.

24.0% Pacific and **20.2%** Māori families experience material hardship, including **inaccess** to new clothing

approximately **102,000 people** in New Zealand are severely housing deprived and have to **survive** on the streets with no home

brief

I aim to develop a fashion collection that embodies versatility, practicality, durability, and protection. In response to the issues of fast fashion, poverty, and challenging public environments, I aspire to create a clothing line that effortlessly transitions from wet to dry, warm to cold, both indoors and outdoors. My goal is to provide long-lasting, highly functional pieces. As a solution for individuals facing hardships, such as those experiencing homelessness and inaccess to new clothing, and outdoor adventurers in need of adaptable, durable clothing for diverse conditions.

CONTEXT - RESEARCH AND HISTORY

GLOBAL FAST FASHION

Pre 1800's

Clothing production and consumption in the pre-1800s period was significantly different from what we see in the modern fast fashion industry. Clothing was typically produced slowly and by hand, with garments often being made by the same family or community members who would wear them. While there were certainly trends and fashions that came and went during this time period, these tended to be dictated by social status, cultural traditions, and regional differences. Clothing was often seen as a valuable commodity, and many families invested significant resources in producing high-quality garments that would last for years or even generations. This focus on durability and longevity meant that clothing was often repaired or repurposed rather than quickly discarded.

1900's

The 1900s saw significant changes in the production and consumption of clothing, with the growth of department stores and mass-produced garments. Clothing production became increasingly efficient, and new technologies like the sewing machine enabled garments to be produced more quickly and cheaply than ever before. As a result, clothing became more affordable and accessible to a wider range of people, and trends in fashion began to change more rapidly. While the seeds of fast fashion were being sown during this time period, it would not be until much later that it would become the dominant force in the fashion industry.

1960s - 1970s

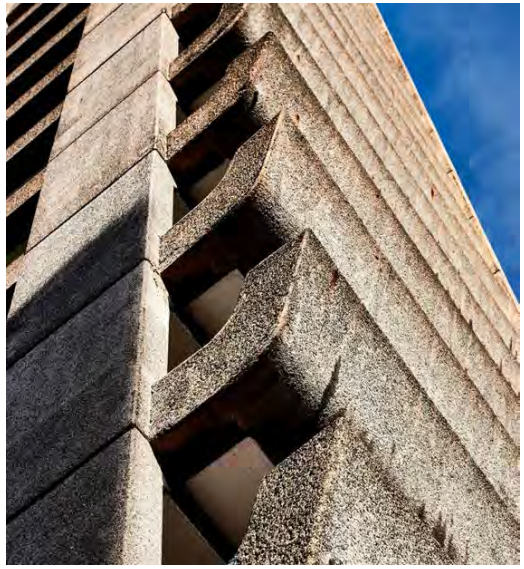
in the 1970s, fast fashion was just starting to emerge as a trend. At the time, clothing was still largely made by hand, with fashion trends taking longer to filter down from the high-end designers to the masses. However, the rise of synthetic fabrics and the development of new manufacturing technologies allowed for the production of clothing at a faster pace and lower cost. This enabled the fast fashion industry to gain momentum. Fast fashion in the 70s may have set the stage for the industry as it exists today, with its emphasis on quick turnover, low prices, and trendy designs.

1990s - 2000s

Fast fashion became even more prominent in the 90s and 2000s, as globalization and technological advancements allowed for faster clothing production and distribution. Brands like Zara, H&M, and Forever 21 emerged, offering trendy clothing at very low prices. The fast fashion industry proliferated, with an increasing focus on providing a constant stream of new styles to consumers. The rise of online shopping also significantly impacted the industry, allowing consumers to shop from the comfort of their homes and enabling fast fashion brands to respond quickly to changing trends. Fast fashion continues to be a significant force in the fashion industry to this day.

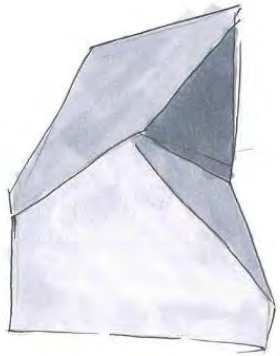
Fast fashion, characterized by its emphasis on speed, low cost, and disposable clothing, has numerous negative effects on the environment, labor practices, and social inequality. The production of fast fashion involves high levels of water and chemical use, as well as significant pollution from textile production and disposal. Workers in fast fashion factories often experience low wages, poor working conditions, and exploitation. In addition, the rapid pace of fast fashion trends perpetuates consumerism and waste, contributing to broader social and environmental issues. The fast fashion industry also often relies on production in developing countries, further perpetuating social and economic inequality.

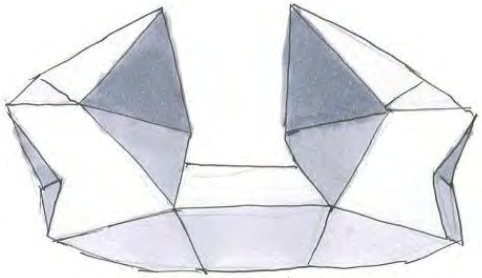
CONTEXT -
Inspirations - Brutalist Architecture



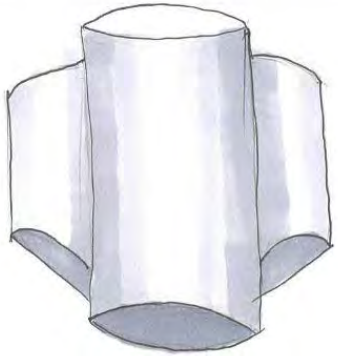
CONTEXT -
Inspirations - Hostile Architecture / Anti Poverty

EXPLORING forms of BRUTALIST ARCHITECTURE

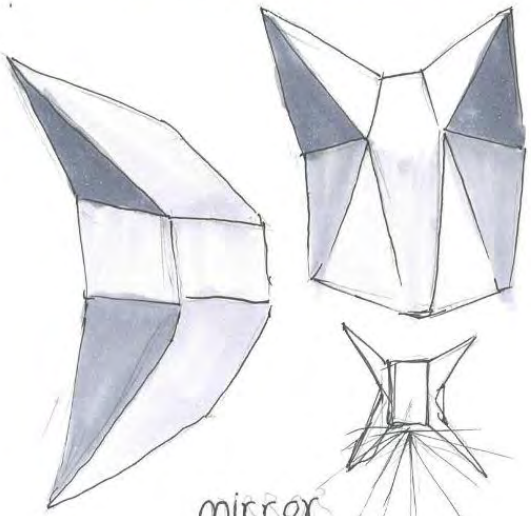




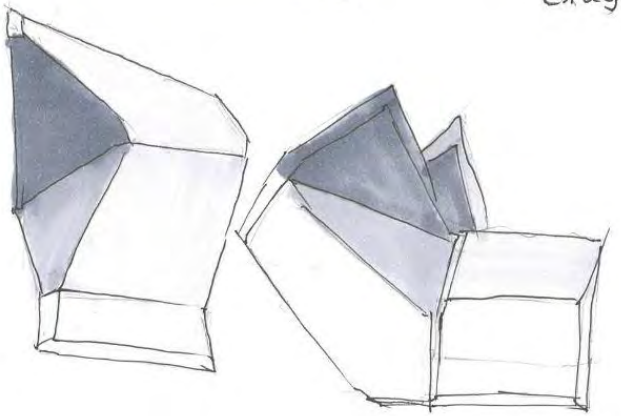
exaggerate

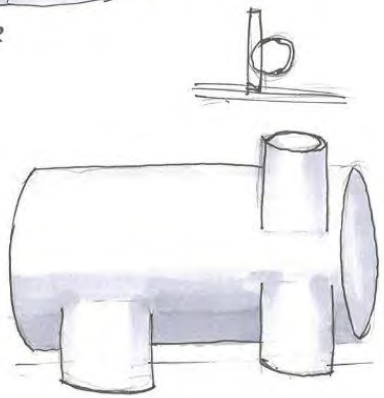


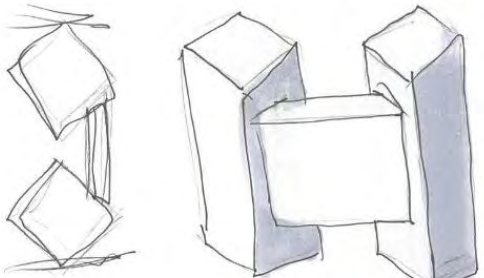
converse

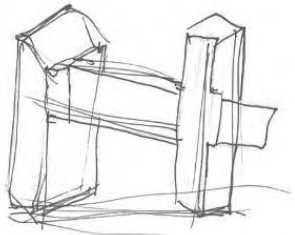


mirror

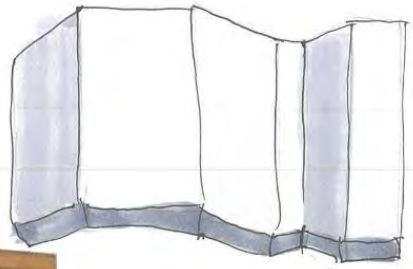


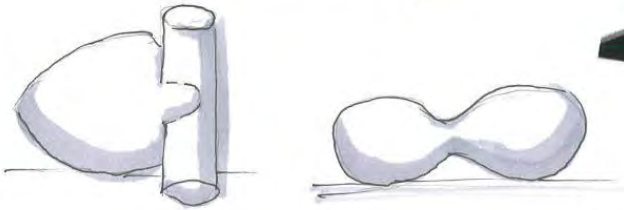


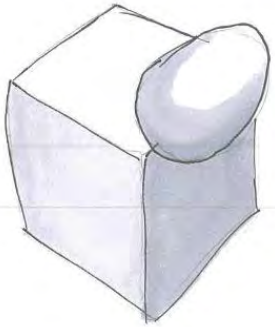




combine





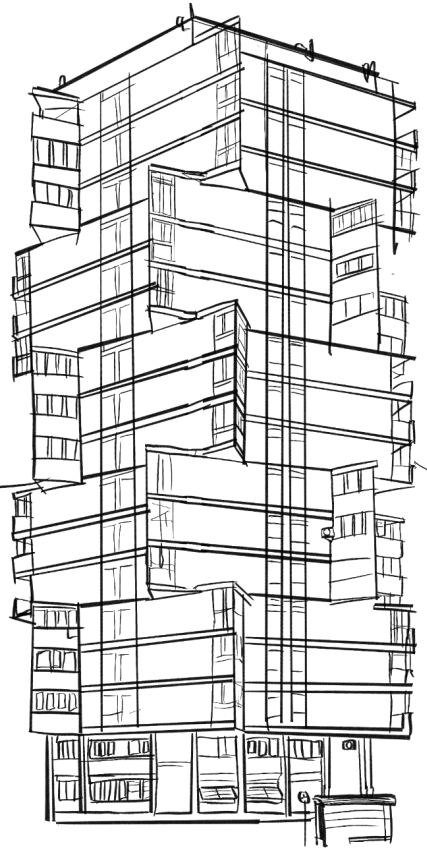


contrast

Initiation - form exploration

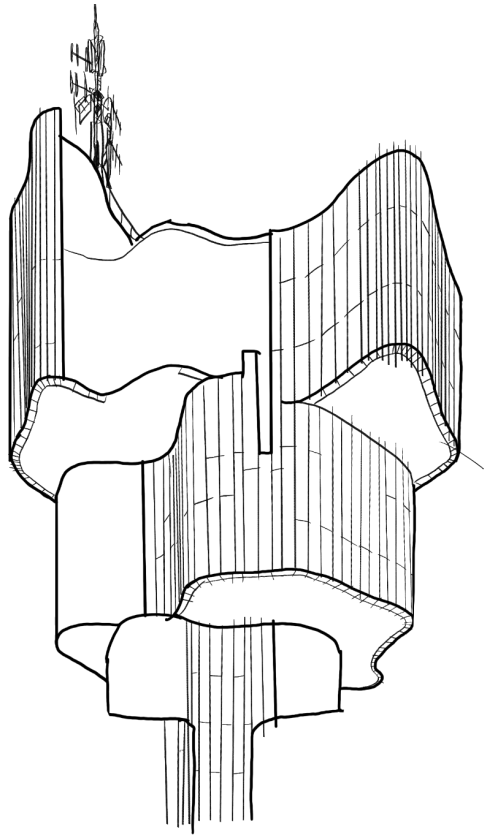
CONTEXT -
Brutalism and poverty

Brutalist architecture and poverty are often associated due to the use of raw, functional concrete buildings in low-income neighborhoods and public housing projects, particularly during the post-World War II era. This was seen as a cost-effective and egalitarian approach to urban development. However, the stark, imposing appearance of brutalist buildings has also contributed to poverty, as many have fallen into disrepair and become symbols of neglect and decay.



While brutalist architecture was intended to address issues of poverty and social inequality, its association with these issues is not necessarily straightforward. Many brutalist buildings were built with the intention of improving the quality of life for residents, but some have argued that their stark, imposing appearance may have actually contributed to a sense of isolation and alienation among residents.

Many brutalist buildings have fallen into disrepair over time, due to a combination of poor maintenance and the perception that they are ugly or unappealing. This has contributed to a negative association between brutalist architecture and poverty, as many of these buildings are now seen as symbols of neglect and decay.



The rise of brutalist architecture coincided with the post-World War II era, when many countries were undergoing rapid urbanization and needed to rapidly construct affordable housing to accommodate growing populations. In many cases, brutalist buildings were seen as a cost-effective solution to this problem.

The raw, utilitarian aesthetic of brutalist architecture was often associated with a rejection of traditional forms of architecture, which were viewed as elitist or out-of-touch with the needs of ordinary people. This rejection of tradition was seen as a way to create buildings that were more functional and accessible to everyone, regardless of their socioeconomic status.

CONTEXT -
Hostile architecture and poverty

Hostile architecture refers to the design of public spaces in a way that stops unwanted behavior, such as loitering, sleeping, or skateboarding. It is a strategy using elements of the built environment to purposefully restrict behavior
. Hostile architecture can be as subtle as simply not providing a place to sit, as obvious as a wall or fence to keep people or animals out, or as aggressive as metal studs embedded in pavement.

Hostile architecture can include sloped or curved benches, armrests in the middle of benches, and spikes covering areas protected from weather. Hostile architecture limits how people experiencing homelessness use public spaces, and discourages them from staying in an area for too long. Hostile architecture systematically targets the vulnerable who rely on public space the most, and disproportionately affects those who rely on those spaces. Hostile architecture is often associated with anti-homeless spikes embedded in flat surfaces, underneath bridges, or in foyers or sheltered areas of buildings, to make sleeping uncomfortable and inaccessible for rough sleepers. Hostile architecture is not only irrational, but also morally repugnant and detrimental to all of society.

Spanning nearly 200 square meters beneath the Huangshi highway, these concrete spikes prevent homeless people from using the bridge as shelter, Residents reported that people used to gather under the viaduct but have since been forced to move out.

Under-road spikes in Guangzhou, China

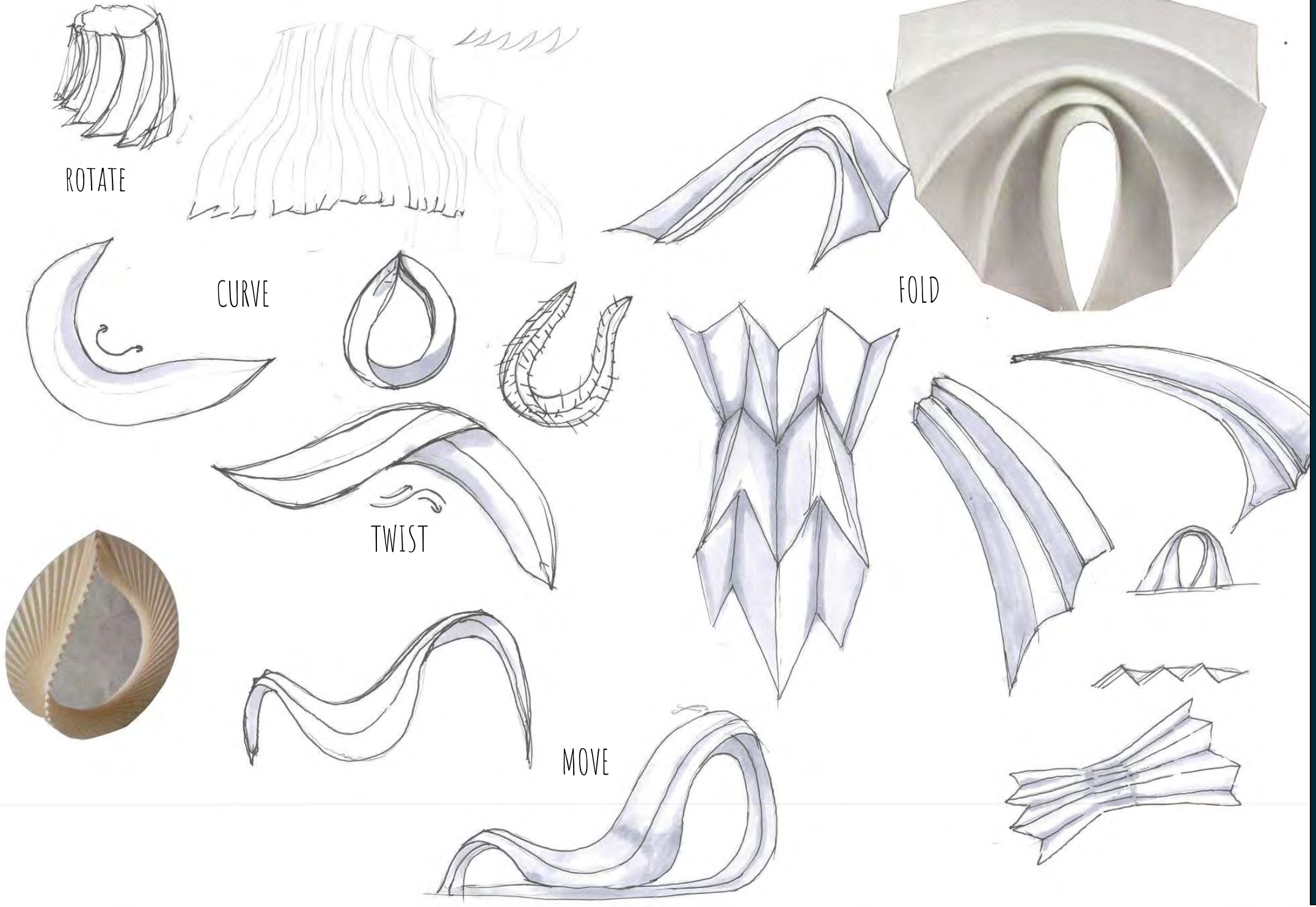
In the words of Frank Swain, the Camden bench is "the perfect anti-object" for its ability to strictly regulate its use. With its irregular curves, it's difficult for skateboarders to grind on it and for people to lie on it; with its crannyless surface, it's impossible to stash drugs in or drop garbage through it. The bench was unveiled to the public in 2012 and has faced harsh backlash since. Prominent among public criticism is the fact that it addresses the symptoms of social issues (e.g., homelessness, drug abuse, littering) rather than their origins..

Camden benches in London, England

In a public square in copenhagen denmark, where usual flat benches used to reside, organic looking concrete mounds sit in replacement. This strange looking form placed there to be used still for sitting but eliminating the possibility of homeless individuals sleeping.

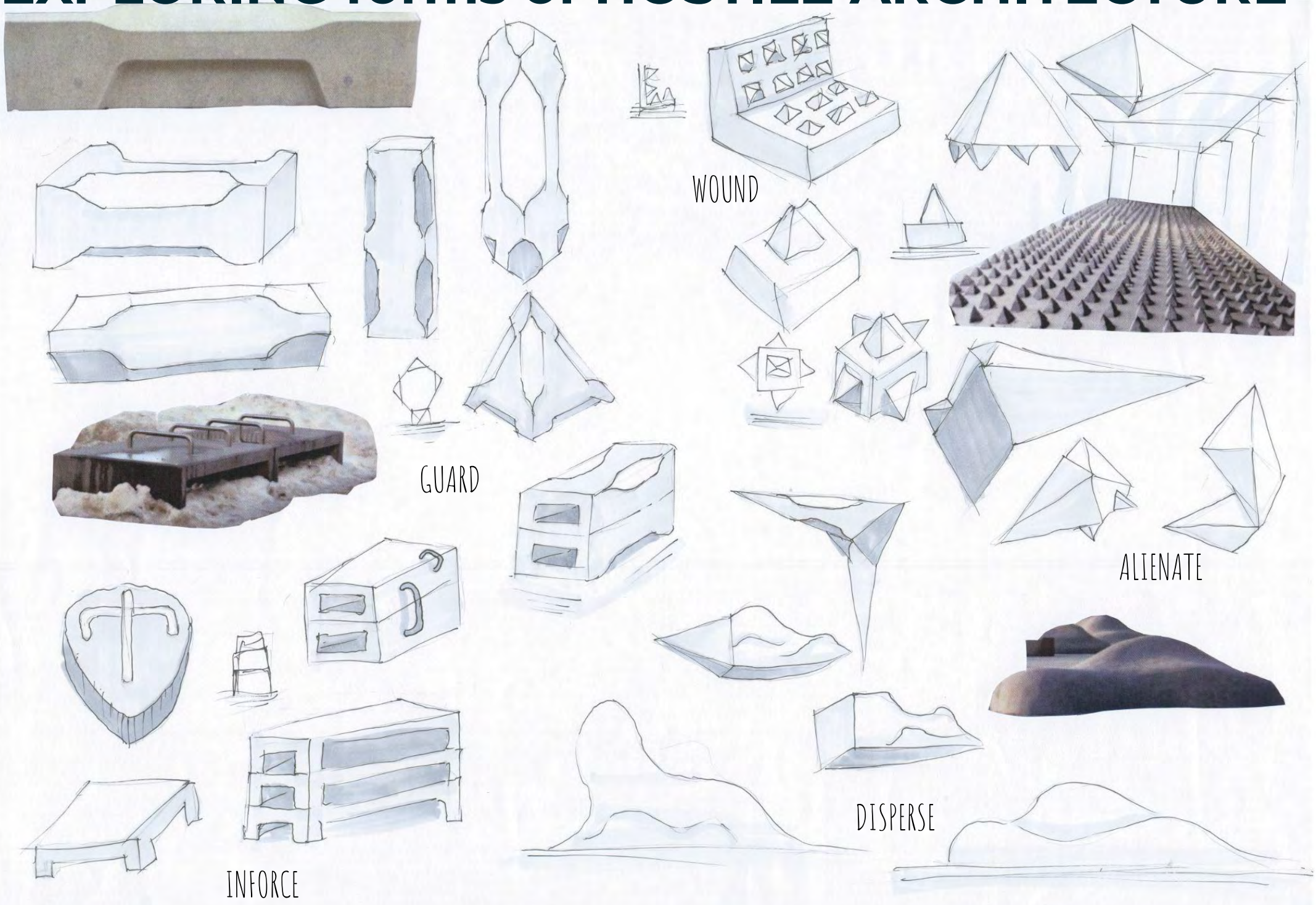
replacement for benches in Copenhagen, denmark

EXPLORING forms of ORIGAMICAL shape



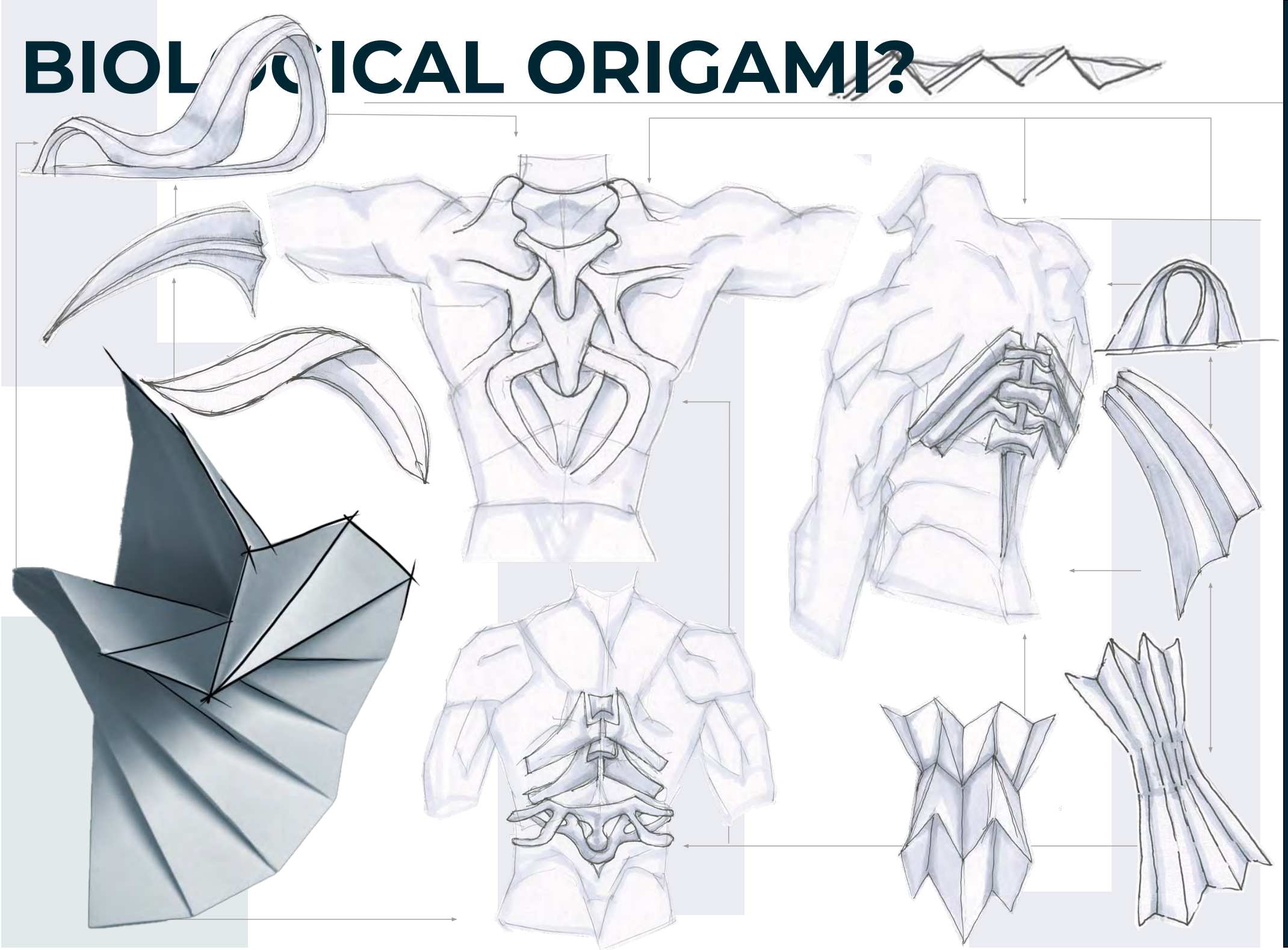
Initiation - form exploration

EXPLORING forms of HOSTILE ARCHITECTURE

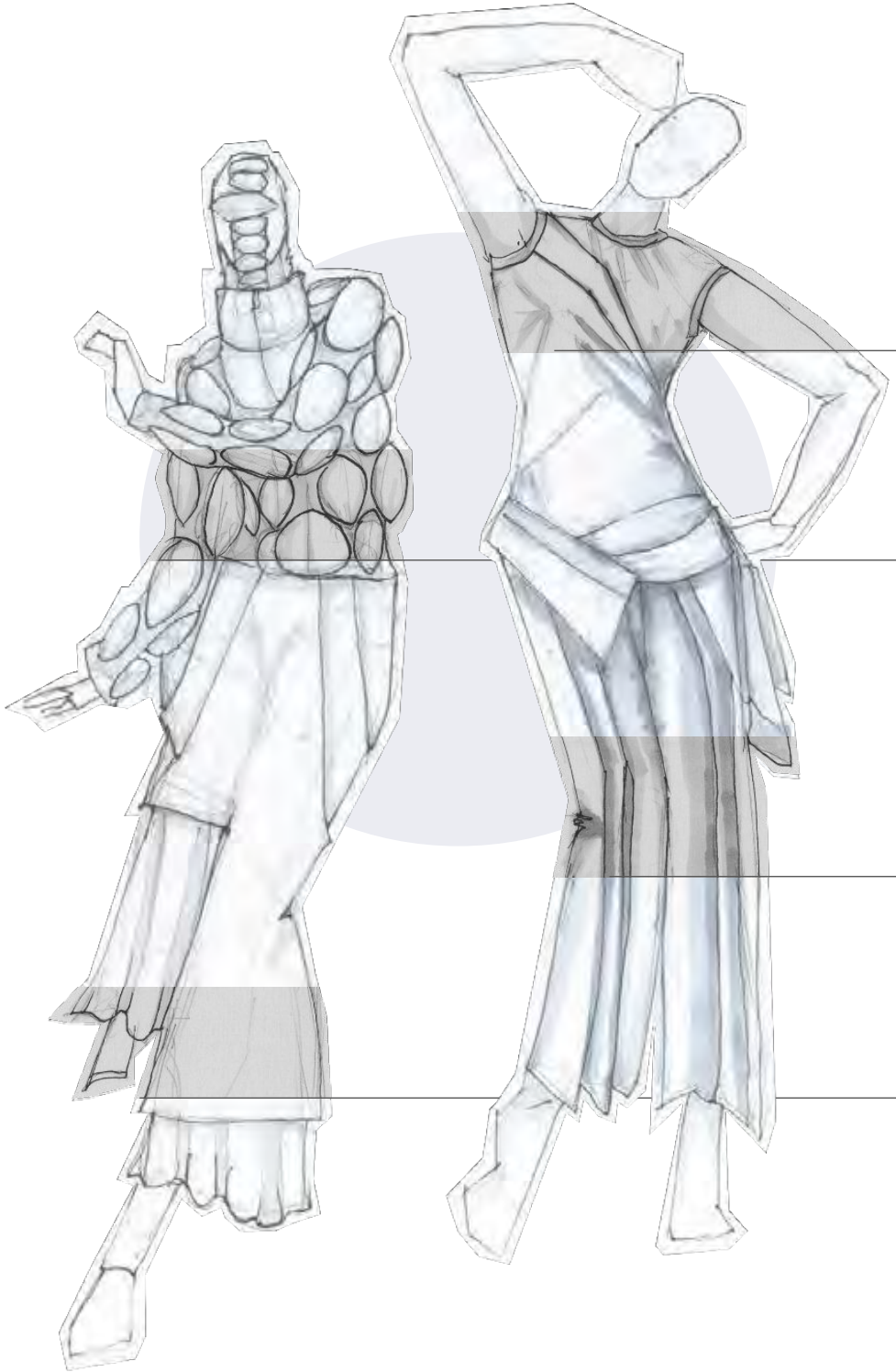


Initiation - form exploration

BIOLOGICAL ORIGAMI?



Initiation - form exploration

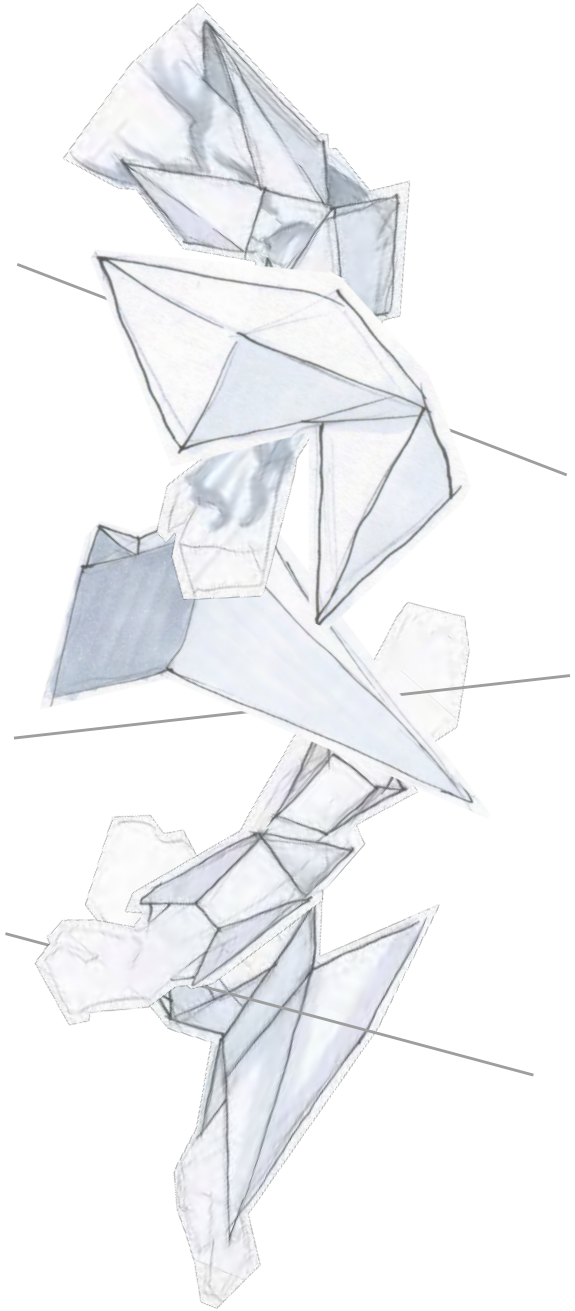


The design concept draws inspiration from the biological origami of brutalist buildings, hostile architecture, and the intricate folding techniques of origami. Two distinct looks have been created, featuring different materials and textures. The left look combines nylon and denim, while the right look combines nylon and leather. Both designs showcase the same silhouettes, folding techniques, and biological shapes discovered through form exploration. The incorporation of folding and origami elements adds depth and dimension to the garments, reflecting the influence of brutalist architecture and organic structures.

Initiation - form exploration

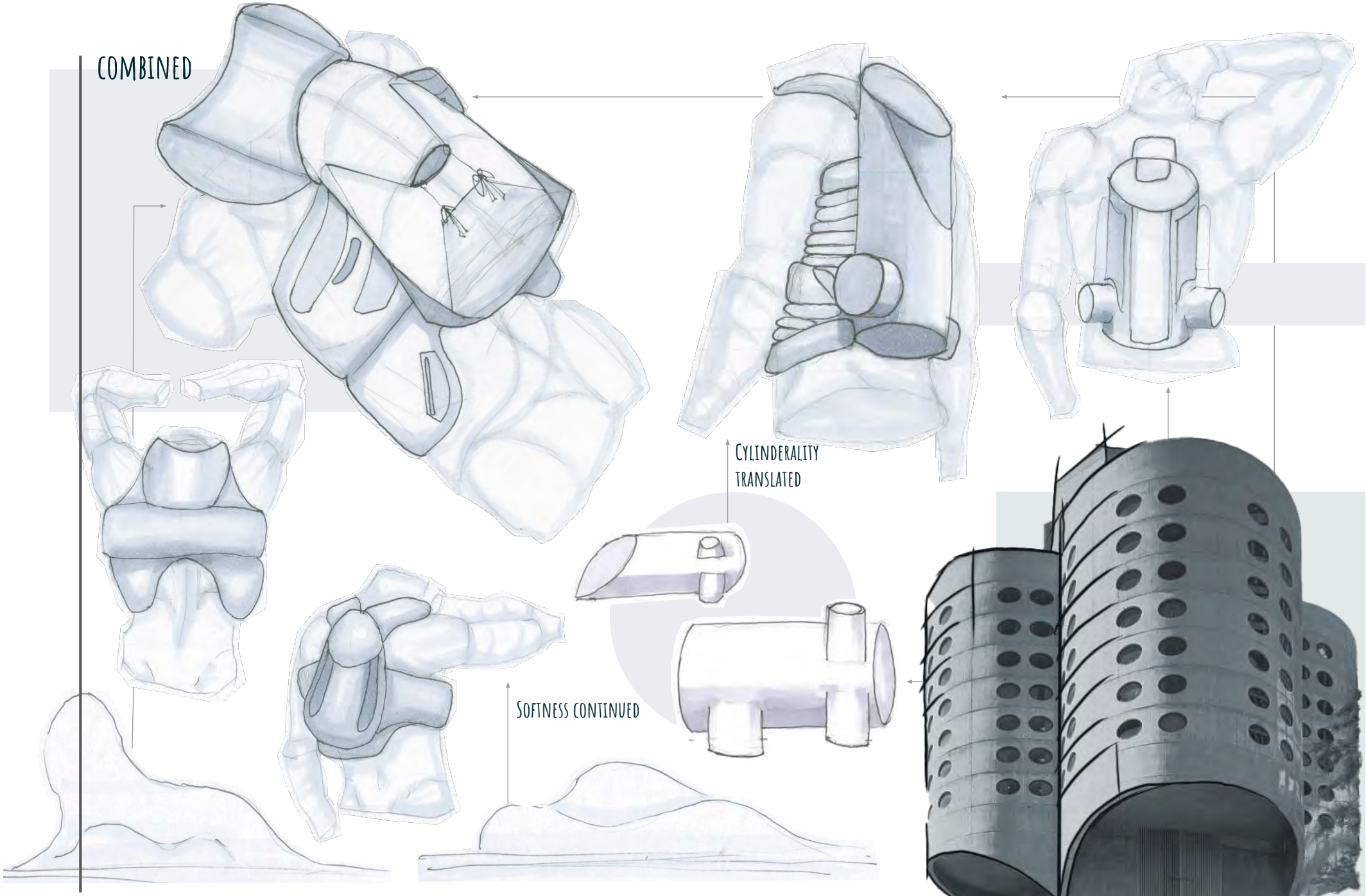
Initiation - form exploration

HARSH ANGULARITY?



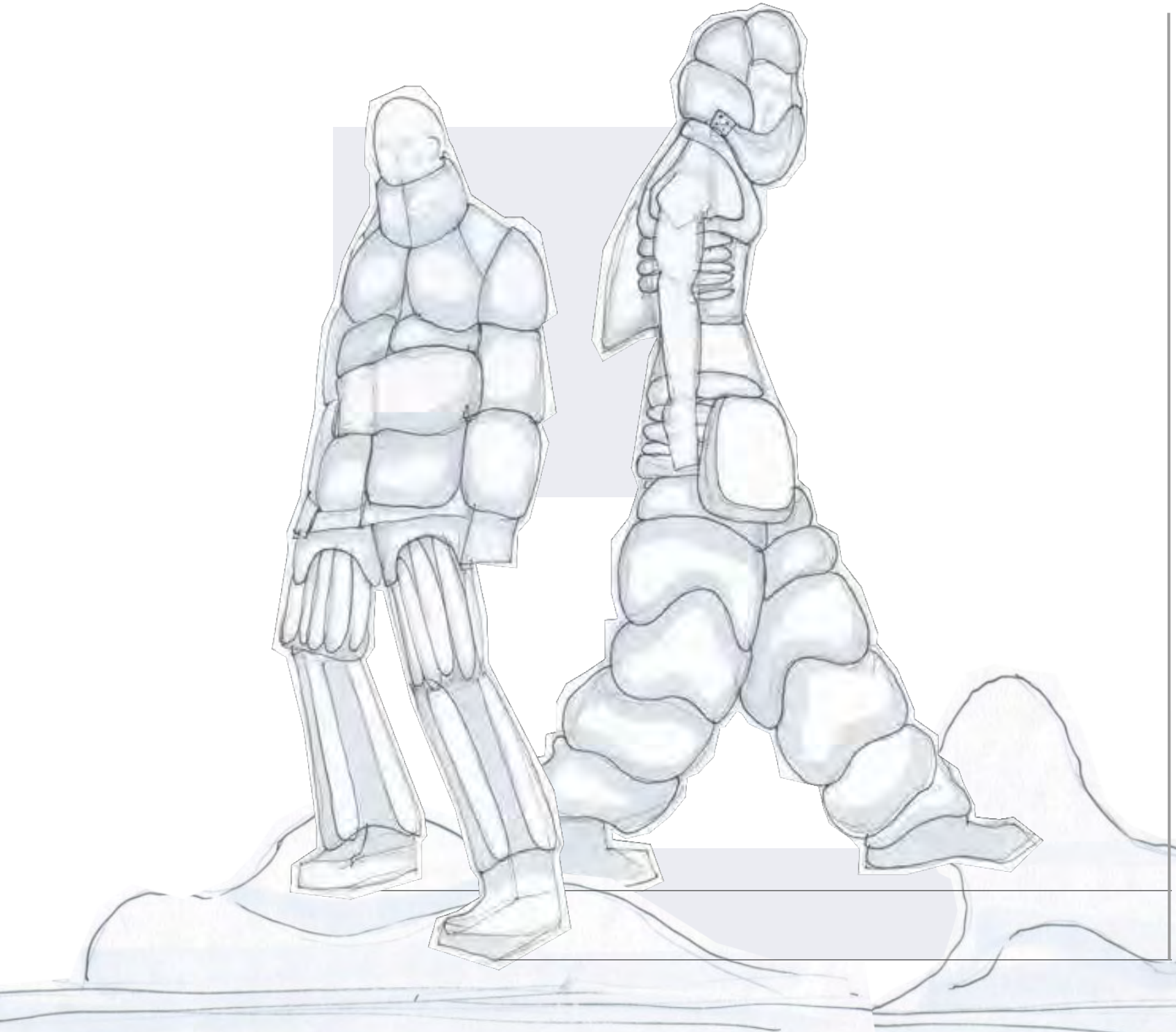
Using forms and a design language influence by the **harsh angularity** of brutalist buildings and hostile architecture. Look one (left) gore-tex, look two (right) leather. Both designs maintain the same silhouettes and angularity seen in the form exploration, capturing the strength and boldness of brutalist architecture and the jagged and danger of the hostile architecture

Initiation - form exploration



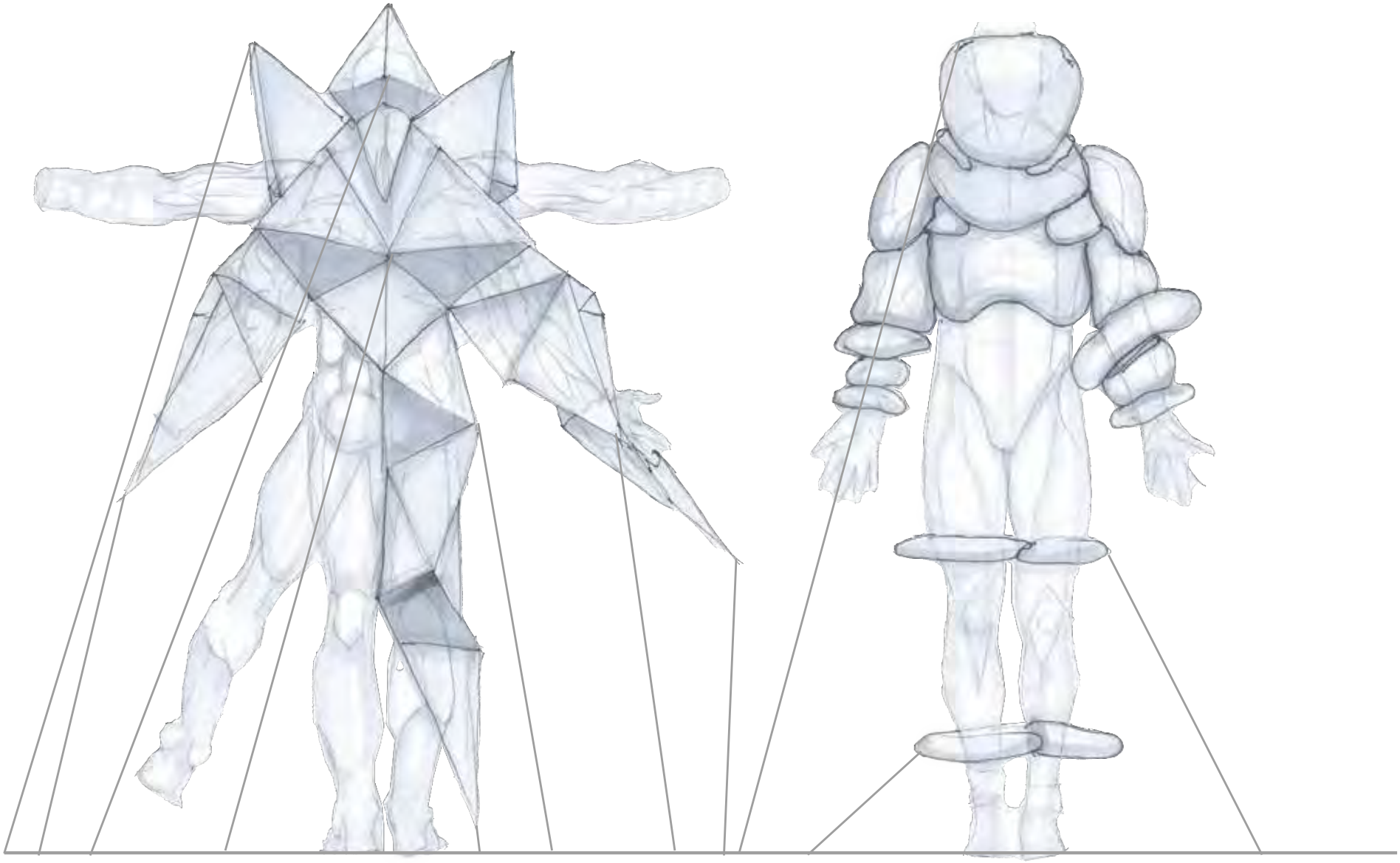
INATURAL SPHERICITY:

Initiation - form exploration

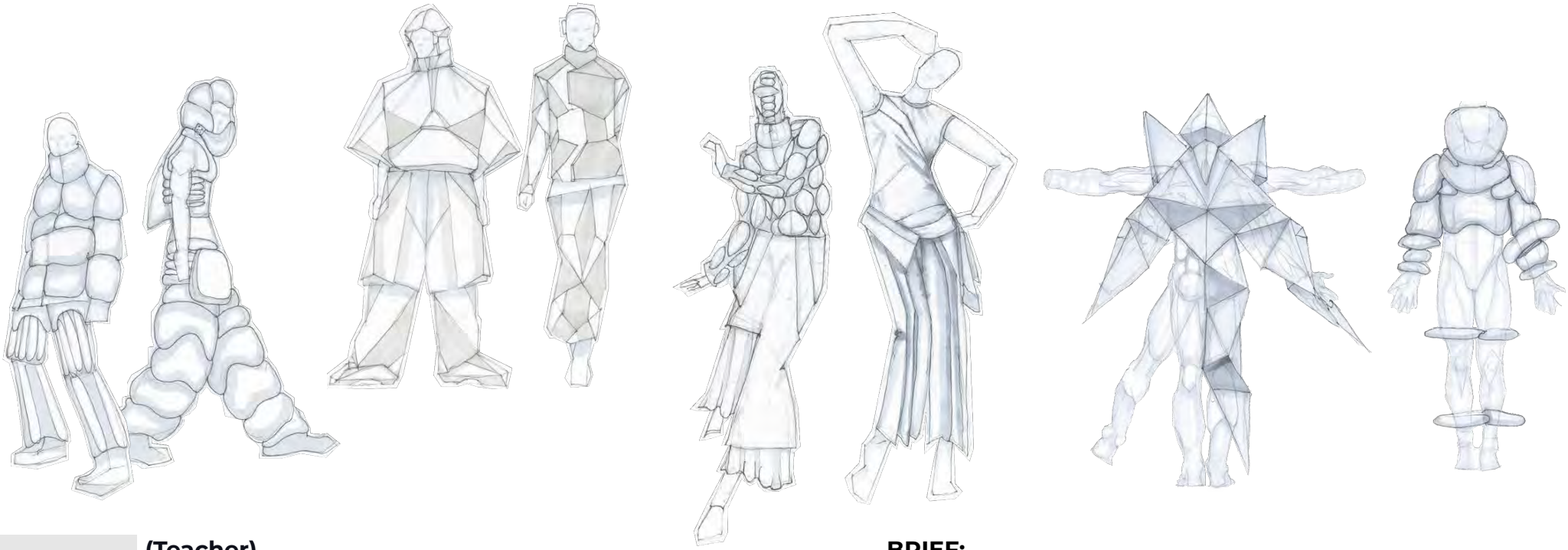


The design concept draws inspiration from the natural sphericity and cylindricity of brutalist buildings and hostile architecture. Two looks have been created, featuring nylon and Gore-Tex materials for functionality and performance. Both looks share the same silhouettes, folding techniques, and biological shapes discovered during form exploration. The designs incorporate rounded forms, gentle curves, and organic shapes, reflecting the influence of natural elements. The collection captures the essence of brutalist architecture and hostile design while maintaining a harmonious integration of the architectural influences.

Initiation - form exploration



At what point does it become un-wearable?



(Teacher)

The style of the garments are visually interesting based on origami, hostile architecture as well as Brutalism and poverty. You have commented **Are they wearable ?** which is a really good point.

The aim for the clothing to be warm and cool, durable and long lasting, versatile for any climate. **How are you addressing these considerations from a functional perspective ?**

Consider existing fashion such as clothing for outdoor activities to meet the requirements for **warm and cold.** Also what materials are **durable and long lasting** ?

Can the function of the clothing b**uild and take away** from itself ? Such as sleeves that are detachable. What will the **system** be ?

What type of **joining** and **construction techniques** could be used for clothing that is **transitional** ?

Currently the garments may not be that easy to move in so this would need to be a consideration.

BRIEF:

Objective: The objective of this project is to create a fashion collection that is versatile, practical and protective. The collection should consist of pieces that can easily transition from day to night, wet to dry, and hot to cold, be more usable than the common garment, and last for a long time.

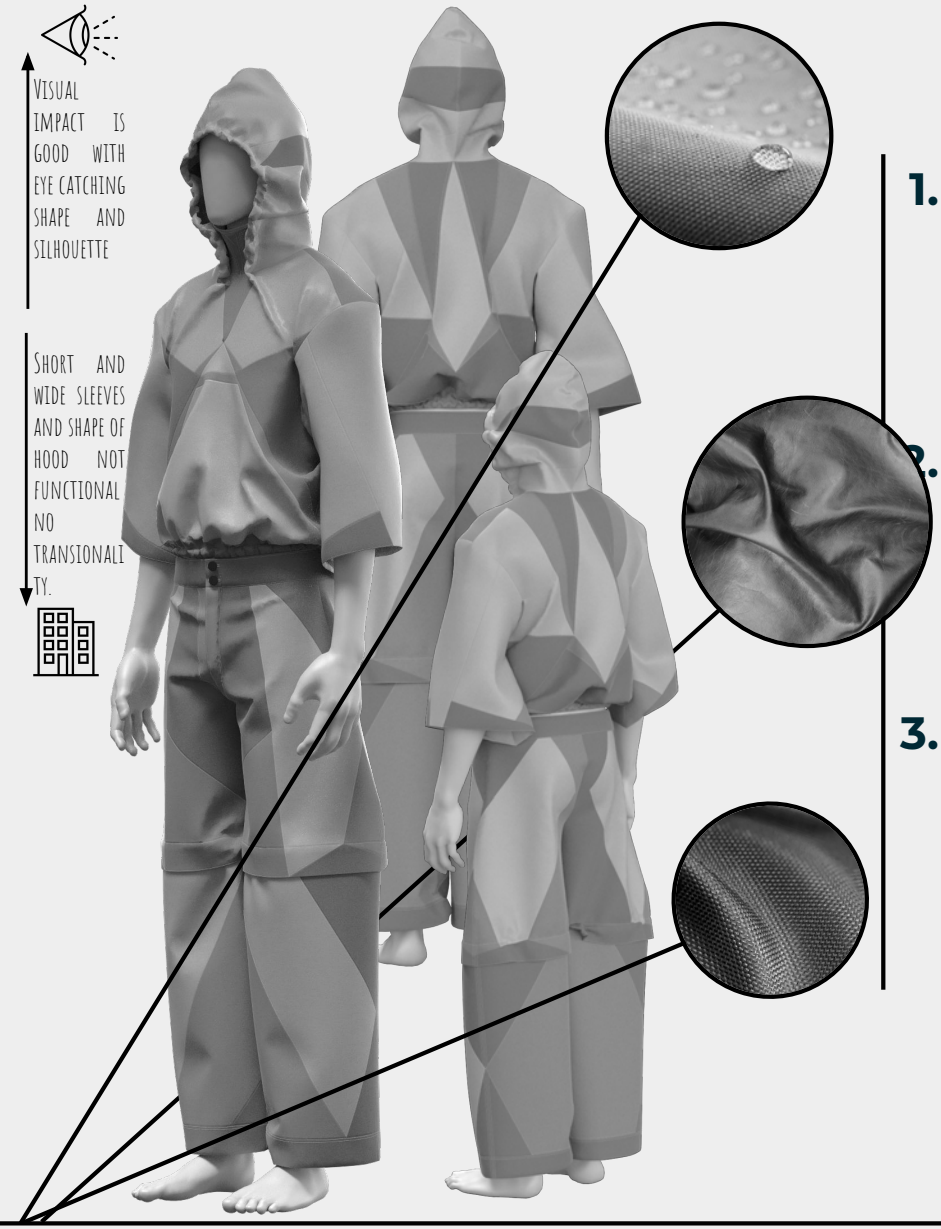
Target Audience: The collection should cater to people in positions of poverty, where clothing that lasts indefinitely and is viable in every condition, social or environmental is needed. The target audience could include, homeless individuals, outdoor adventures.

Design Brief: a collection of looks that are versatile, and practical, designed with interchangeability, durability and sustainability in mind. The pieces should be able to mix and match easily to create a large number of different variations depending on the needs of each individual wearer.

The lives of people in positions of poverty, adventurers or the common people are all individual and thus have deceptively complex and different needs, as the clothes they wear experience all environments, situations, and spaces that they do. My design must consider all aspects of this to be successful.

Visual impact is good with eye catching shape and silhouette

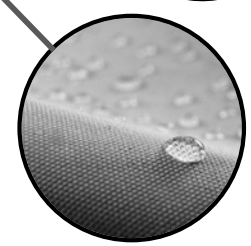
Short and wide sleeves and shape of hood not functional no transionality.



1. **HOW CAN VISUAL IMPACT AND PRACTICALITY BE BALANCED?**
2. **HOW CAN FORM AND FUNCTION BE INCORPORATED?**
3. **HOW CAN FUNCTION AND DURABILITY BE BALANCED?**

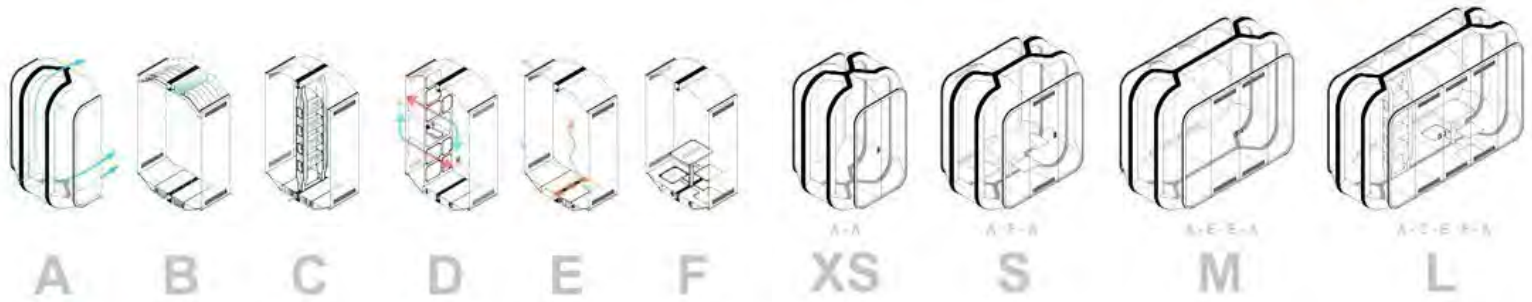
Durable materials

INITIATION - STAGE 2 - REVISION



1. HOW CAN MODULARITY BE INTEGRATED?
2. HOW CAN THE DESIGN INTEGRATE ITS ENVIRONMENT
3. WHAT WILL THE SYSTEM BE?

INITIATION STAGE 2 - REVISION

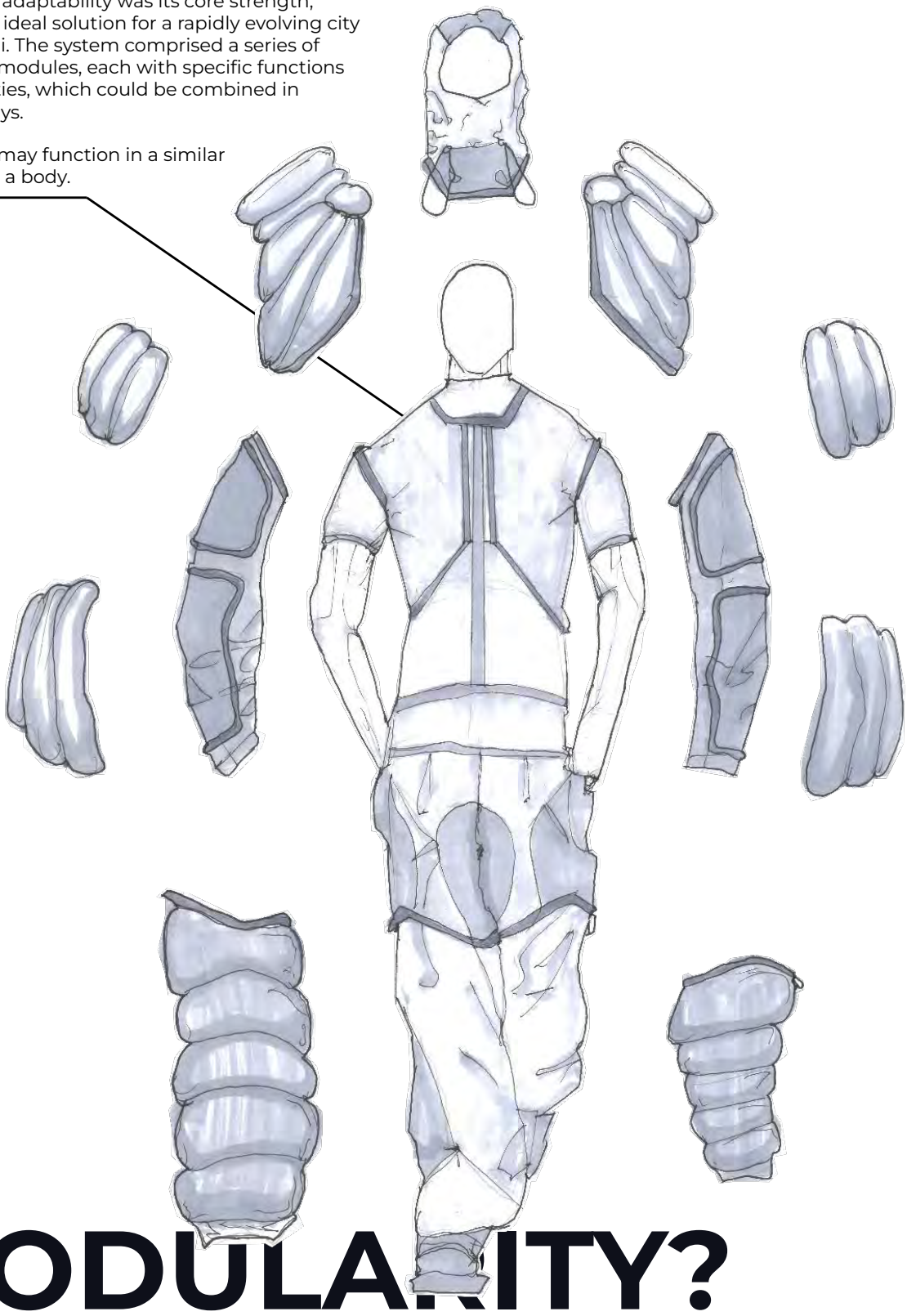


Florian Marquet is a Shanghai-based young architect who has proposed a flexible modular system called "The Org" this is an example of how there modularity works. "The Org" was designed to be a modular architectural system that could be easily assembled, disassembled, and reconfigured to suit various purposes. Its adaptability was its core strength, making it an ideal solution for a rapidly evolving city like Shanghai. The system comprised a series of interlocking modules, each with specific functions and capabilities, which could be combined in countless ways.

How would it work?

Much like Florian Marquet's "Org," my modular clothing system would emphasize sustainability and longevity. Instead of buying entirely new outfits for different occasions, consumers could invest in a few core pieces and gradually build their wardrobe by adding modules as needed.

My system may function in a similar way, but on a body.



MODULARITY?

INITIATION STAGE 2 - REVISION

Development

FASTENER CONSTRUCTION

.ZIPPER

DESCRIPTION

A fastener consisting of two rows of teeth on strips of tape and a sliding piece that closes an opening by drawing the teeth together. It is commonly used for binding the edges of the opening of fabrics or other flexible materials, including clothing, luggage & bags, camping gear, and sporting goods.

STRENGTHS

zippers are designed to be durable and made from materials such as brass or steel, which are known for their strength and durability.

WEAKNESSES

Zipper slider failure is a common issue where the slider becomes loose or breaks, causing the zipper teeth to no longer connect properly. This can only be resolved temporarily by crimping the slider or permanently by replacing it.
If used in inerchangabe peicins zipper paths must be the sample length on both slides, limiting it's maximum capabilities

FASTENER CONSTRUCTION

.CORD AND LOOP

DESCRIPTION

A fastener consisting of multiple loops of fabric and a chord or lace that is weaved or strung inbetween the loops. It is commonly used for tightening the sides of shoes together. A similar system is ftern used in outerwear (rainjackets, waterproof pants, ect) but inclosed in a layer of fabric.

STRENGTHS

Chord and loop systems are very customisable as they are basic in nature, loops are easy to place and integreat into eny edge.

WEAKNESSES

Chord failure is a common issue, where the chord or lace used wears down and snaps or breaks, this can only be resolved by permanently replcasing the chord, due to the open nature of the system it is much more difficult to create a seal, like one your would see in a zipper or seam tape system.

FASTENER CONSTRUCTION

.BUTTON/SNAP

DESCRIPTION

A button is a small, round fastener that joins two pieces of fabric together by slipping through a loop or by sliding through a buttonhole. A snap fastener, also known as a press stud, popper, or snap button, is a small metal or plastic object used to fasten clothes, made up of two parts that can be pressed together.

STRENGTHS

Different types of buttons and snaps vary in strength, with stainless steel snaps generally being stronger. While zippers are more versatile, buttons and snaps excel in durability, especially under repeated use or impact.

WEAKNESSES

Buttons and snaps can become loose or pop off with frequent use, making repairs necessary. They are also challenging to use when wearing gloves or when working in certain situations. Replacing buttons and snaps can be time-consuming and may require specialized tools or skills.

FASTENER CONSTRUCTION

.SEAM TAPE/ ADHESIVE

DESCRIPTION

seam sealing tape is an adhesive tape that is applied to the seams of raincoats and other products to prevent water penetration and add strength to the seam joint. The tape can be made of various materials and can be applied using a seam sealing machine or an iron.

STRENGTHS

Seam tape or adhesive tape is crucial in raincoats to prevent water penetration through the jacket's seams. It enhances the seam's strength and waterproofness.. The durability of the tape depends on its quality, application method, thickness, and composition.

WEAKNESSES

seam tape or adhesive tape can wear out over time and may need to be reapplied to maintain the waterproofing of the raincoat. Additionally, exposure to harsh weather conditions, such as extreme heat or cold, can also affect the durability of the tape. Further any seamns of joins the tape is applied on can not be interchanged

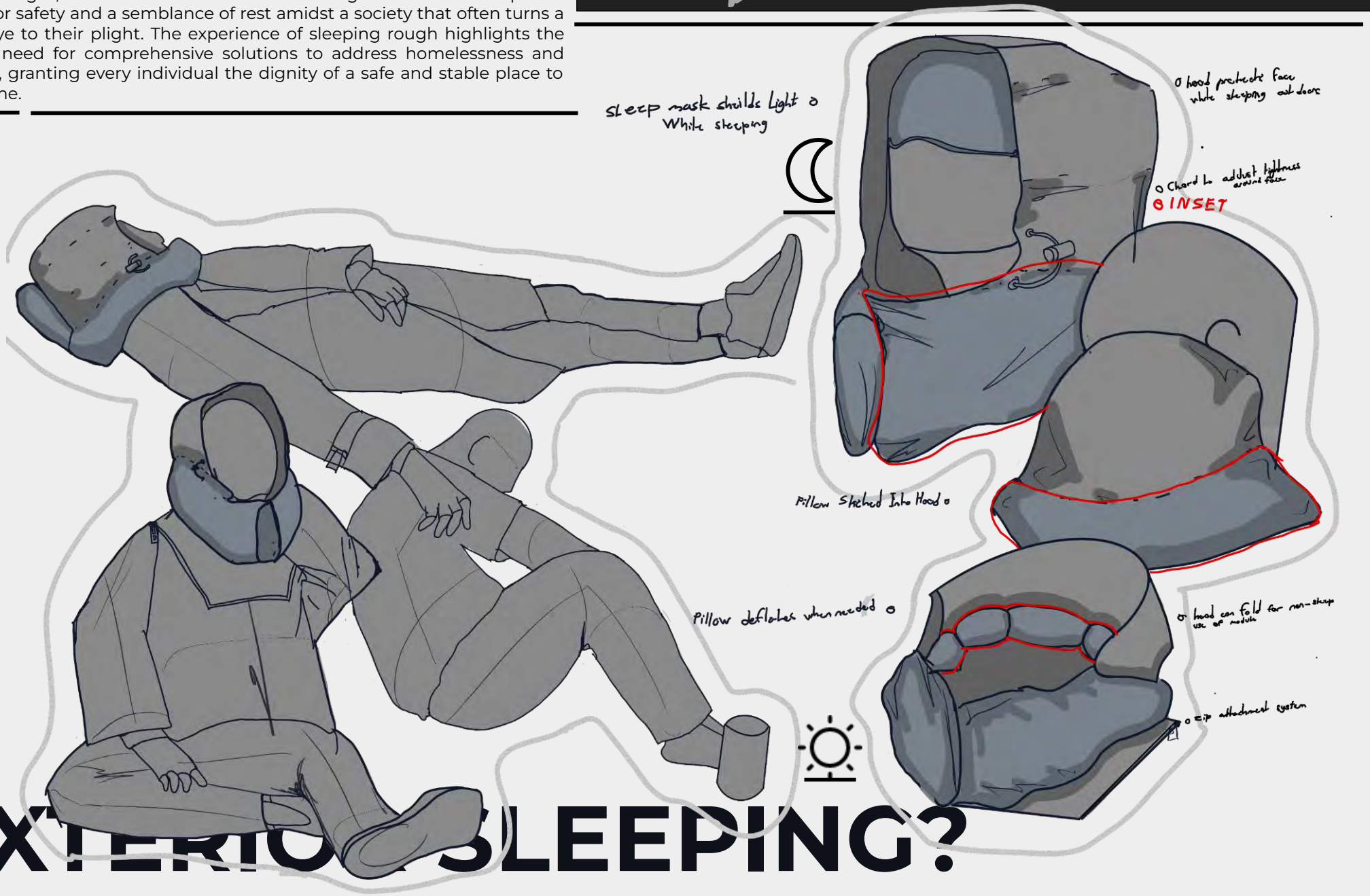
PACKABILITY?

Outdoor practicality

Development

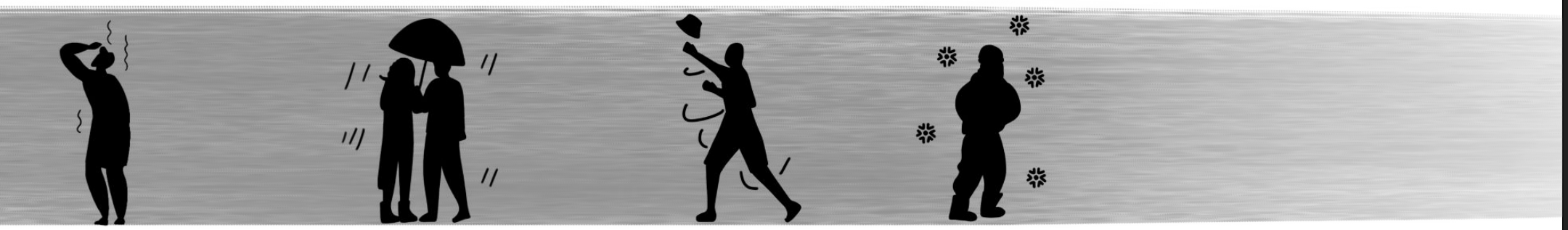
Homeless and impoverished individuals endure the heart-wrenching reality of having to sleep outside, exposed to the unforgiving elements of nature. With no stable roof over their heads, they grapple with constant insecurity, vulnerability, and the absence of basic human comforts. Whether it's the biting cold of winter nights or the scorching heat of summer days, they brave it all, trying to find shelter in makeshift tents, under bridges, or in abandoned corners. Each night becomes a desperate quest for safety and a semblance of rest amidst a society that often turns a blind eye to their plight. The experience of sleeping rough highlights the urgent need for comprehensive solutions to address homelessness and poverty, granting every individual the dignity of a safe and stable place to call home.

1. How can I incorporate privacy?
2. How might this module be used anywhere?
3. How can this be worn day and night?



EXTERIOR SLEEPING?

Development



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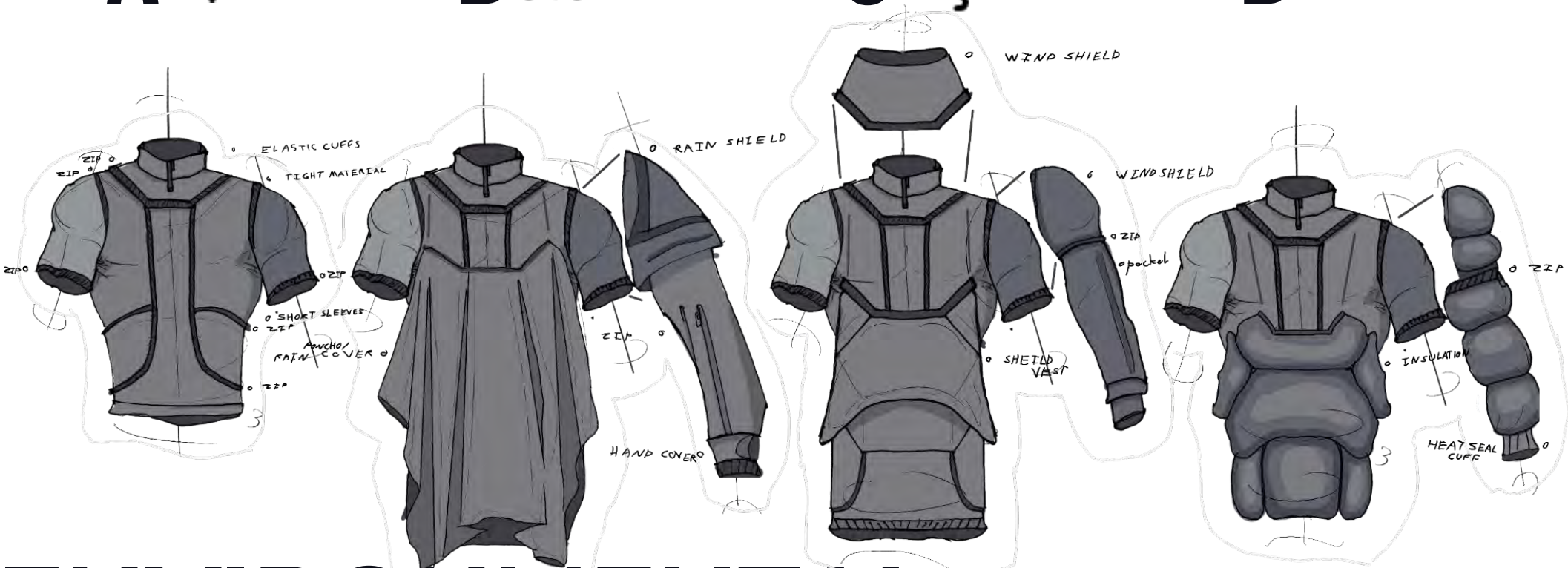


ENVIRONMENTAL PROTECTION?

Development

PROBLEMS

I feel like the design has lost the aesthetic aspects it is supposed to draw inspiration from.

Designing an entire module set to combat wind seems unneeded so wind protection will be incorporated into both the wet and cold environmental modules

I am unsure how I can incorporate packability into this system This involves either making each module foldable and fit into its own bag, which might be too complex and detract from the module's design, or designing a separate bag for the entire system, which could be beyond the project's scope and compromise the quality of the modules.

DESIRES

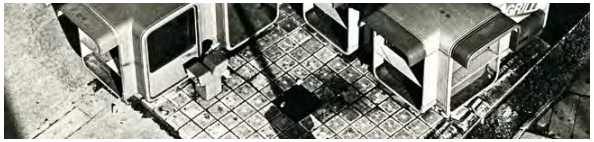
I want the aesthetic half of the design to really draw insparations from the brutalist and hostile architecture, I want the wearer to feel the industrial harshness and urban resilience of both languages.

I would like to incorporate a design language that brings cohesivity to all the modules, like recurring lines or shapes created by the zips.

I also really want to make sure each module fits its purpose design wise, so extra care will need to be taken into consideration when developing them further.

I have built up a good base with the forms/concepts I have developed so far, however to reach the goal I want to reach I will continue to use the feedback provided, and develop these modules in 3D., I feel I need to design with more guidance.

MODULAR DESIGN



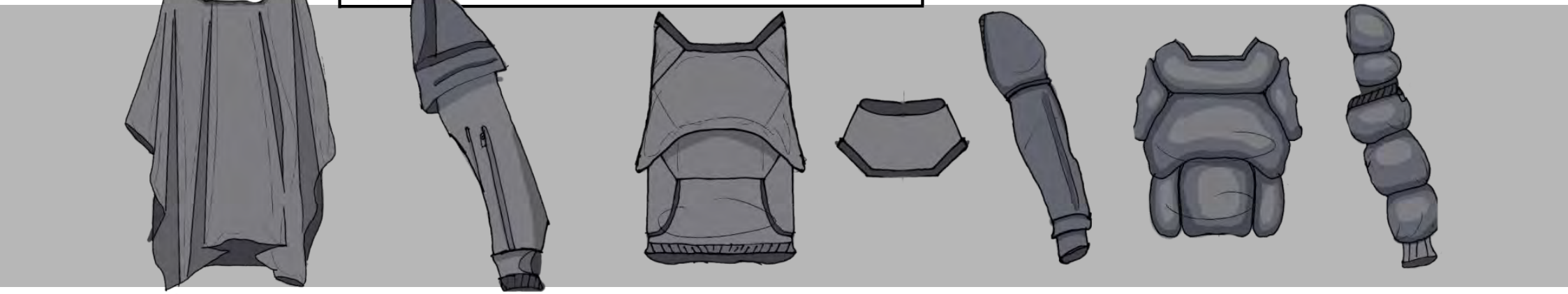
Translated Guidance

FROM ARCHITECTURE TO FASHION

Modular design is a design principle that subdivides a system into smaller parts called modules, which can be independently created, modified, replaced, or exchanged with other modules or between different systems

The term "modular design" was only coined in the 20th century, initially being applied in architecture and later on in manufacturing, software design, and various other fields
The pioneer of modular design is not a single person, but rather a concept that has been developed and applied by many professionals in various fields

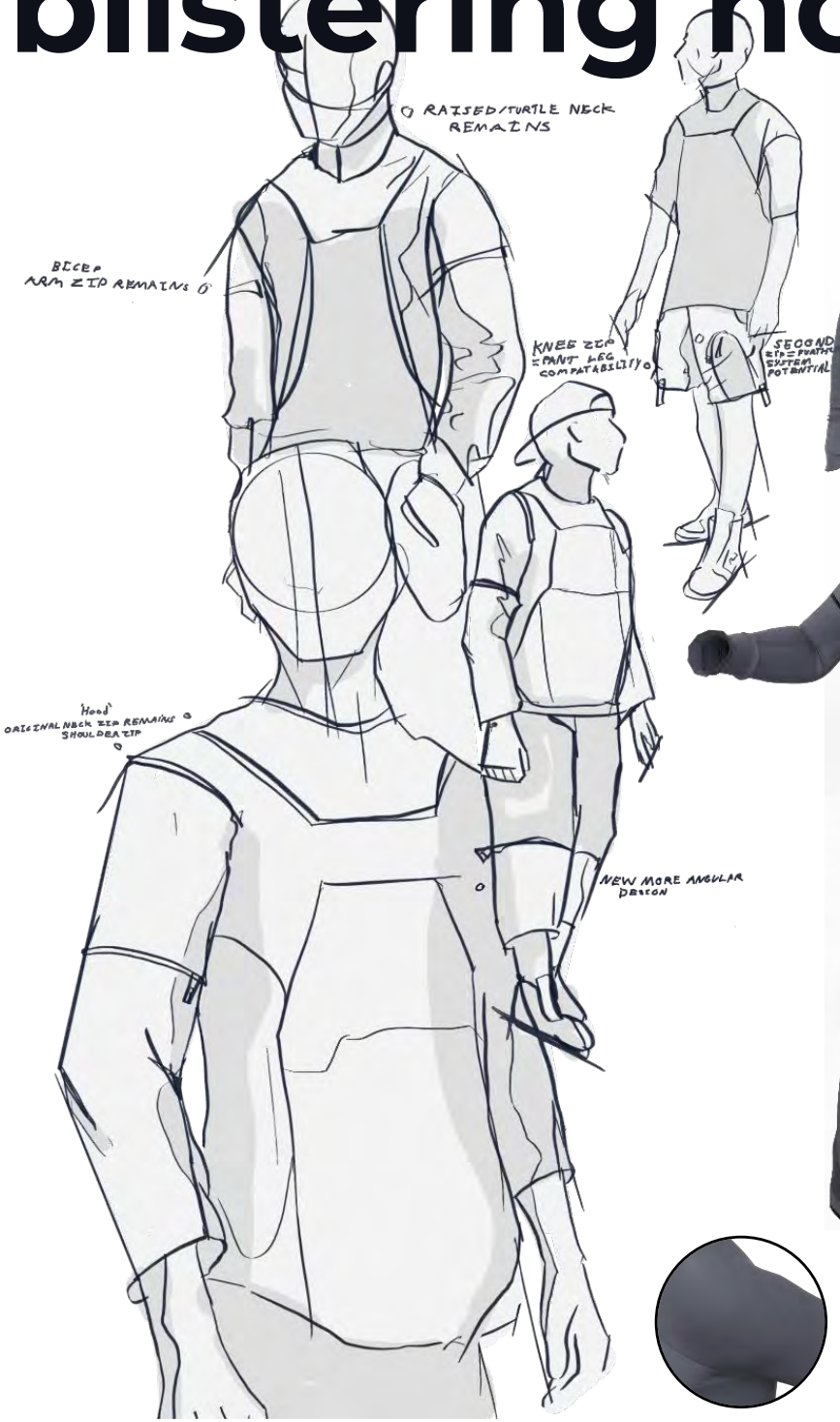
1. identify the core elements or modules that make up the garment.
2. Define the rules or guidelines that govern how the modules can be used and combined.
3. Engage with standardization of the components, which have to be compatible and fit together exactly.
4. Design the garment as modular from the outset.
5. Consider the functionality of the garment and how it can be adapted as it lasts.



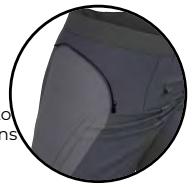
I like it, but I don’t love it

Develop - ment

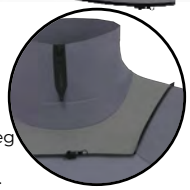
blistering hot environment



Zip at shoulder seam, seen in previous iterations has been removed to prevent irritations it may cause when moving.



Upper Thigh exterior zip has been added as a anchor point to enable a future modules for the leg that may extend from the knee zip.



The turtleneck module is now stitched normally, and the zip is now on the outside to attach modules over it, rather than replacing it.

For hot conditions, breathable nylon webbed fabric is used on the upper chest, armpits, and back for optimal cooling

Development

B1

B1 Hood now connects directly to neck zip connection, with inner elastic sides and rain guard for optimal protection in harsh conditions.

Storm modules connect via zippers on warm modules. storm top/hood use hexagonal neck zip. Storm pant module layers over warm pant module, connects via upper thigh zip.

B2

B2 module has hidden waterproof chest cargo pockets, allows for carrying sensitive cargo. Hidden Sleeve zip allows for detachment while maintaining waterproof seal.

B3

B3 Outer zips allow adjustable cuff around leg, inner elastic and shirring on rear cuff for snug fit around shoe/boot.

In the unforgiving landscapes of harsh environments, where rain and wind lash out with relentless intensity, the significance of robust outerwear cannot be overstated. These specialized garments serve as a steadfast shield against nature's elements, providing a crucial barrier that stands between the wearer and the hostile conditions that could otherwise lead to discomfort, illness, or worse. For those experiencing poverty, the importance of reliable outerwear in the face of storms, rain, and wind becomes even more pronounced. Limited access to resources can exacerbate the challenges posed by inclement weather, making it imperative for individuals without the means to constantly replace or upgrade their clothing to have durable, weather-resistant outerwear.

B sopping wet environments

Development

Development

C❄ Frigid cold environments

C1

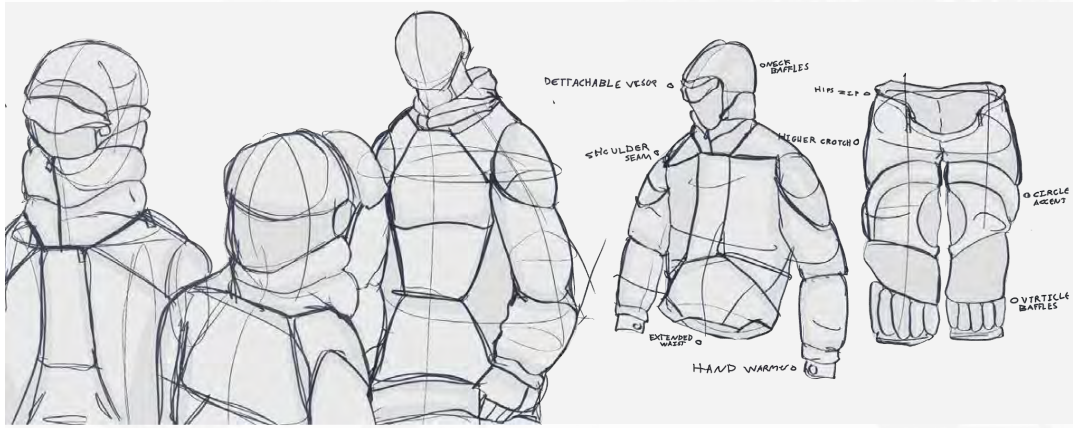
C2

C3

Urban environments at can become bone-chillingly cold, especially during the winter months. The combination of concrete buildings and asphalt streets can absorb and radiate cold, creating an environment that can be dangerously frigid. In such conditions, homeless individuals are particularly vulnerable to the harsh elements. Protective clothing becomes not just a comfort but a necessity for their survival. As temperatures plummet and wind chills intensify, Having access to cold protective modules in this system can provide a lifeline for those without a warm place to call home, offering them a chance to endure the unforgiving urban cold and seek shelter in the clothing they wear.

In the most extreme outdoor environments, the cold can reach bone-numbing levels, presenting a formidable challenge to adventurers and explorers alike. Whether trekking through Arctic tundras or scaling towering mountain peaks, these intrepid souls require clothing that goes beyond conventional winter wear. Protective clothing designed for extreme cold becomes their trusted companion, shielding them from the relentless chill and enabling them to push the boundaries of exploration. These adventurers and explorers may also make use out of the same modules in this system providing not just comfort, but the critical element of survival in these unforgiving landscapes.

sketches



C3 Pant module attaches at the hip following the silhouette of the base module shorts (A2) • C3 waist seals tightly round A2 shorts to ensure heat insulation is optimal • Blue circular rectangle represent inside cargo pockets inside of C2 • C2 waist extended down at the crotch to ensure optimal heat insulation • C1 has modular viser to block snow and wind from reaching the face and eye • Sleeves stay non-removable for essential weather protection and garment structure.

STAKEHOLDER FEEDBACK - ZIPPER

In the creation of these garments, for people in positions of poverty, outdoor adventures, and the fashion conscious, where clothing that lasts indefinitely and is viable in every condition as well as being practical and protective in these environments is crucial; I want to ensure I'm informed and considered, as I'm not in the position of any of these groups. However, integrating stakeholder feedback can bridge this opening. [redacted] is one of my primary sources of information, being a boulderer, climber adventurer, and outdoor education teacher at [redacted]. Presenting [redacted] with all previous pages, he has provided very insightful feedback to inform parts of the rest of my process. For the most part many of the technical aspects of my designs need to be refined further.

Standard puller

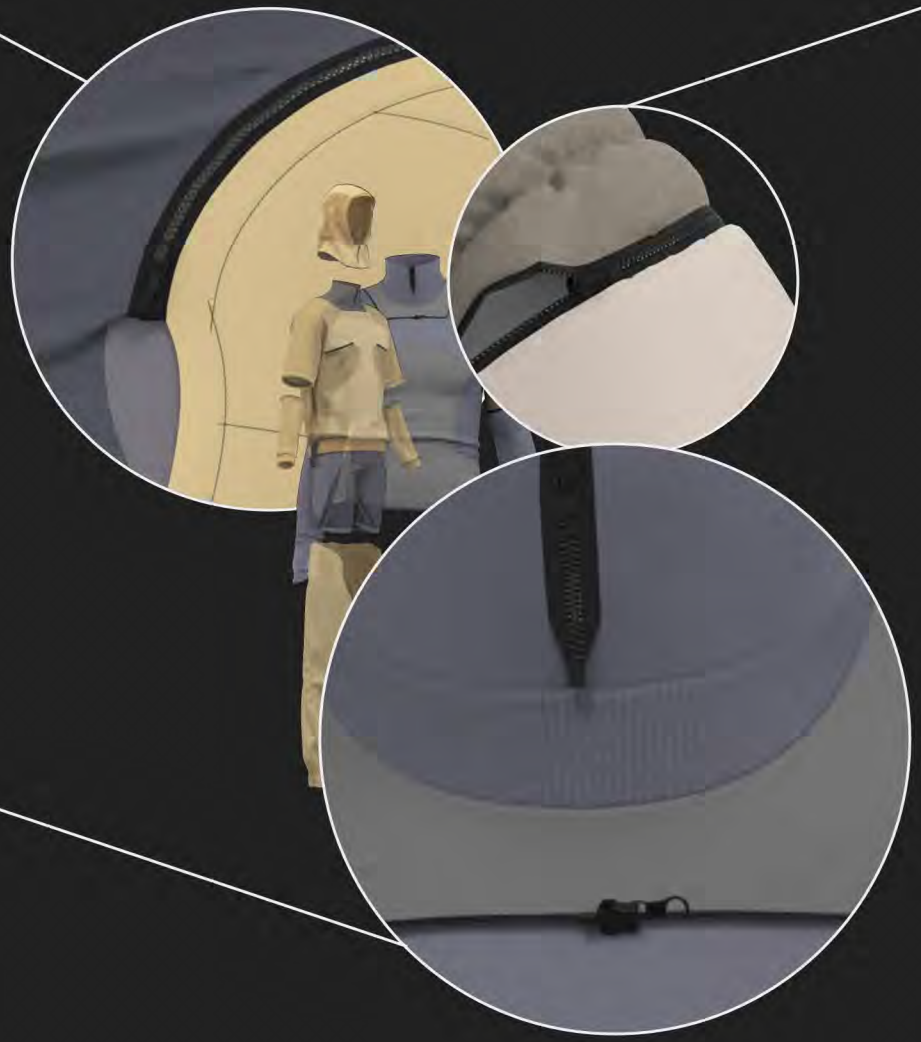
[redacted] was quick to point out a crucial flaw in an aspect of my design, highlighting the sole reliance on a single type of zipper puller. He astutely illuminated the numerous shortcomings and limitations that this particular choice introduced to my design, all while suggesting straightforward avenues for improvement.

Negative impact?

In summary, [redacted] asserted that using standard zippers in less than ideal conditions posed significant challenges. He emphasized the inherent difficulty of manipulating zippers when they were subjected to less-than-optimal circumstances, such as adverse weather conditions or when one's hands were wet or gloved. he underscored the importance of addressing these issues within my design, as it could significantly impact the user's overall experience and satisfaction with the product.

What causes this?

- Size of the puller
- Material of the puller
- Texture of the puller
- Durability of the puller



How can I solve this?

The main solution to solve this problem is to define rules and guidelines that govern how and when different zip pullers are used.

Different zip pullers?

Different zip pullers of different materials ,textures ,sizes and shapes can be used to make the zip more optimal for use in different situations

Z1.
Longer chord base attached via a knot, large chunky handle. Most ideal for use in hard-to-reach spaces or while wearing gloves.

Z2.
Compact metal attachment, flexible fabric handle. Most ideal for use in areas where a metal puller would be uncomfortable/have to lie flat.

Z3.
Compact metal attachment point, less exaggerated chord, smaller handle. Mix of both Z1 & Z2 most ideas for use as the default puller where no specialisation is needed.

Refinement

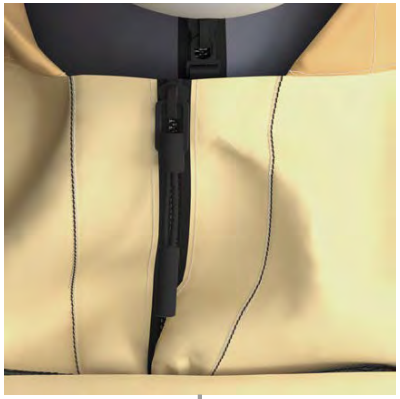
Refined Zips implemented

(Enhanced visibility through the application of a white coloration in example)

Low profile Z2 puller is used for the collar zip as the low profile and wide puller facilitates glove-friendly access, but still simultaneously allows for less discomfort while layering.

Flexible Z2 puller used in the bicep zip to ensure minimal discomfort during movement and ease of access while in use.

Z2.

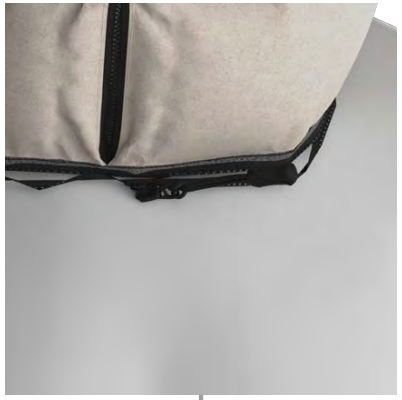


Z3 puller used in collar zip of the hood to ensure optimal acces while in wet conditions as well as being small enough to be unobtrusive when worn while wearing.

The Z1 puller is employed on the leg cuff tightening zips to facilitate easy access, in potentially awkward positions such as bending over, while also being optimal for use in wet conditions

Z3.

The Z1 puller is employed on the collar zip of the hood to ensure optimal use wearing heavy gloves in freezing/cold temperatures



The Z1 puller is employed on the neck zip connecting the hood module to the base module to ensure optimal accessibility, considering that the zip is situated between the baffles of the modules.

Z1.

Refinement

Feedback

admired the practicality of the warm modules that also serve as a base for the other ones, He was particularly captivated by the attachable arm segments and the impressive ventilation capabilities they offered. was able to visualise the use of these garments in the outdoor adventures he goes on, like climbing hiking etc. He envisioned how these modular pieces would seamlessly enhance his mobility while also effectively managing temperature in scorching environments.

Negative impact?

However, due to the thinness and limited durability of the nylon fabric, there is a significant concern that any zipper attached to this thin fabric might result in tearing when worn or used. Furthermore, pointed out that the inability of the neck to fold downward could potentially lead to discomfort when worn for extended periods.

- Module is less durable
- Repair becomes difficult
- Other modules can not be used if these modules are damaged
- Neck cover may cause irritation

Solutions?

After carefully considering the feedback, and I have determined that the optimal approach to address this durability flaw is to prioritize durability over the complete lightweight aspect of the material. This involves incorporating heavier, more robust structural fabric around the vicinity of the zipper systems.

Neck improvement

Two additional zipper systems have been incorporated on either side of the initial zipper, affording the wearer the flexibility to unzip any one of the three zippers of their choice simultaneously, or unzip both side zippers and fold out the collar and central section for enhanced comfort.

STAKEHOLDER FEEDBACK
A-Modules

A

Refinement

Refinement

STAKEHOLDER FEEDBACK B-Modules

Feedback

was impressed by the design from both an aesthetic and functional perspective. He was immediately drawn to its overall appeal, noting how seamlessly the aesthetic form and function blended together. His admiration extended to the removable sleeves, a feature that not only added versatility but would help with Temperature Control and Regulation. However he did allude to some large functional issues that the design may present from a functional perspective.

Chest cargo pockets are not practical

The waterproof material lacks breathability, necessitating the addition of ventilation.

There's limited breathability in the pants section of the rain module

The rain protection visor/cap is too small to function optimally

The hood frame around the face lacks a secure fit;

Bright colors for visibility may clash with the design and might not be preferred by those in need.

B

Solutions & changes

Relocating Cargo Pockets

To address the impracticality of chest cargo pockets, I relocated them to hoodie-like pockets, ensuring that wearers could access their belongings more conveniently. Further i implemented a larger middle cargo pocket less frequently needed cargo. This change enhanced the overall usability of the design without compromising storage capacity

Improving Breathability with Armpit Vents

In response to the issue of limited breathability, I introduced armpit vents into the design. These vents improved airflow, making the garment more comfortable to wear in various conditions while still maintaining its waterproof properties.

Implementing Pants-to-Shorts Conversion

To address the restricted breathability in the pants section of the rain module, I redesigned it to allow for conversion into shorts when needed. This feature provided wearers with the flexibility to adapt to changing weather conditions, offering comfort in both rain and warmer temperatures.

Enlarging Rain Protection Visor/Cap

To enhance rain protection, I enlarged the rain protection visor/cap. This modification resulted in the visor/cap overlapping the wearer's face more effectively, thus providing superior shielding against rain.

Enhancing Hood Fit with interior Elastic

to improve the fit of the hood around the face and enhance overall protection, I incorporated elastic into the hood frame. This adjustment allows wearers to customize the fit for a snug and secure fit, effective protection against the elements.

Refinement

Feedback

liked the original design, functionality, and aesthetics I had designed; however, it was brought to my attention that When it comes to designing cold-weather garments, several factors need to be carefully considered that I did not. These considerations include whether to incorporate removable sleeves or not and my use of baffling techniques for optimal heat retention.

Baffling
Baffling, which involves the construction of insulation compartments within a garment, plays a critical role in heat retention. Vertical baffles, especially when they are large, present challenges in maintaining warmth. These baffles can allow insulation to settle at the bottom, creating cold spots along the seams and leading to an uneven distribution of warmth.

Large vertical baffles

Down filling

Small horizontal baffles

To enhance heat retention, designers should consider alternatives such as horizontal baffles or smaller vertical baffles. These designs distribute insulation more evenly, reduce the risk of cold spots, and improve overall insulation performance. Tightening seams and using high-quality insulation materials can also contribute to better heat retention, ensuring the garment effectively protects against the cold.

Icebreaker
'Merinoloft'

Removable Sleeves?
The decision of whether or not to make sleeves removable in cold-weather attire and where to attach the hood is pivotal. Removable sleeves, while adding versatility to adapt to varying weather conditions, introduce complexities in construction and potential weak points in insulation. For instance, renowned companies like Icebreaker prioritize functionality and simplicity in their designs, often opting for non-removable sleeves to maintain structural integrity and insulation effectiveness.

Coloration
Similar to feedback regarding the B modules, he found the colors of the C modules lacking cohesiveness with the other modules and didn't see them serving any practical purpose.

Solutions & changes

To address concerns related to construction complexities and potential insulation vulnerabilities, I have decided to make the sleeves non-removable for the C2 module. This choice enhances structural integrity and insulation performance • the initial larger vertical baffles have been replaced with smaller horizontal ones, primarily focused around the chest and abdomen areas where heat retention is of paramount importance. This adjustment ensures a more even distribution of insulation and minimizes the risk of cold spots • a comprehensive overhaul of the material colors has been undertaken to establish a cohesive visual connection among all modules. This redesign not only enhances the aesthetic appeal but also promotes a harmonious and unified look across the entire modular system.

STAKEHOLDER FEEDBACK C-Modules

C

FASTENER MATERIAL

PLASTIC (NYLON)

PROS

- Lightweight and flexible, making them ideal for lightweight outerwear
- Can be more affordable than metal zippers
- Corrosion resistant
- Not bulky
- Quiet to operate

CONS

- Less durable than metal zippers and more prone to breaking or snagging
- Not suitable for heavy-duty items

FASTENER MATERIAL

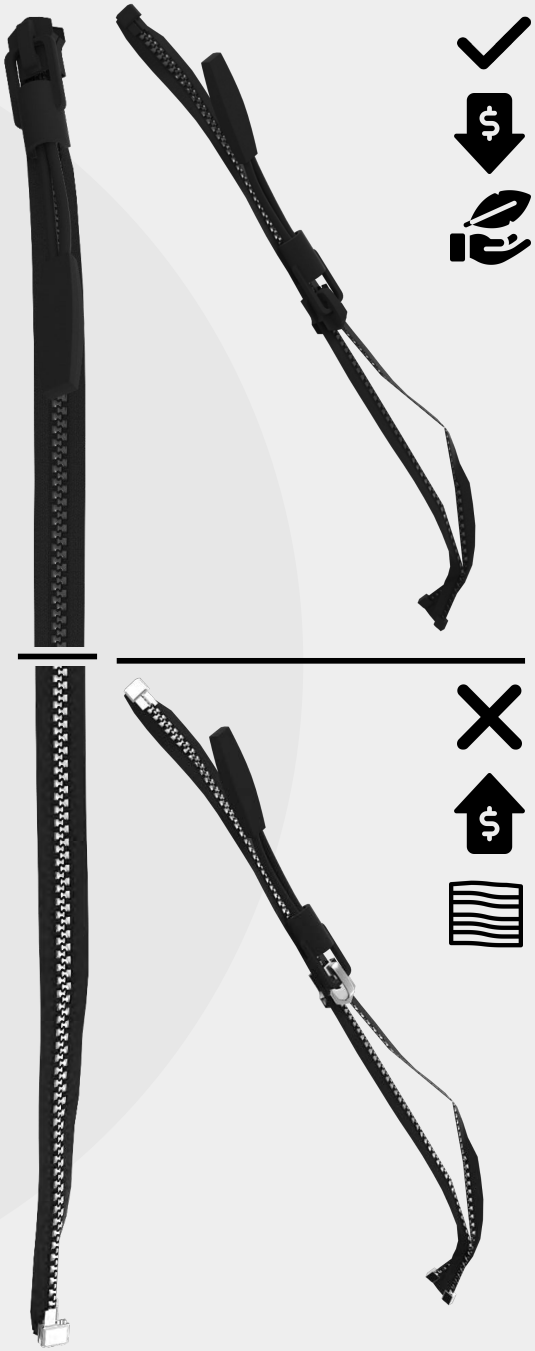
METAL (ALUMINUM)

PROS

- Very durable and long-lasting.
- Will function optimally for longer
- Metal zippers offer better security as they are less likely to be forcibly opened

CONS

- Can be heavy and bulky, which may not be ideal for lightweight outerwear.
- Can rust or corrode over time, if in suboptimal conditions for long enough



PLASTIC, OR METAL?

WHY?

Throughout my process so far I have refined the zippers based on the varying application they would be used for, however I have not taken the durability of the materials used in the system into account, and to reach the amount of durability I want the system to present, this needs to be done.

IS ONE BETTER THAN THE OTHER?

Metal zippers are usually favored for outerwear due to their exceptional durability and strength. Crafted from materials like brass and aluminum, they withstand heavy use and rough handling. Their resistance to heat ensures durability in extreme conditions. Metal zippers offer enhanced security, reducing the risk of forced openings, making them suitable for cargo pockets with valuable contents.

Plastic zippers provide a lightweight alternative for outerwear, perfect for casual and lightweight garments, as they do not add bulk. Cost-effectiveness is a significant advantage, making them suitable for budget-friendly clothing lines and mass-produced items. Plastic zippers resist corrosion, making them ideal for wet conditions and swimwear. Their smooth and quiet operation is advantageous for garments that require ease of use and minimal noise.

TURNS OUT, ONLY SLIGHTLY

Although both materials have an almost exact same amount of pros (and cons) and that technically metal is more tough than plastic, based of of the needs of the users and the harsh environment these modules may be present in, corrosion resulting from environmental factors like moisture, salt, or humidity could cause a malfunction or failure in any of the zipper systems, rendering the modules unusable. Replacement of these metal zippers would be more difficulties to source, and fatally more expensive.
Where in contrast a malfunction in a plastic zipper could be sourced and replaced way easier and cheaper.

So, I will continue to use plastic (nylon) in this project

Refinement

MODULARITY ENVISIONED

84+
Combinations
For any
possible
desire
protection,
Comfort,
or fashion

A1-A2

RE

B1-B2-B3

C1-C2-C3

1 2 3

A1-A2-C3

C1-A1-A2-C3

A1-B2-A2-C3

B1-A1-A2

A1-C2-A2-B3

C1-A1-D2-A2-C3

Water ingress problem

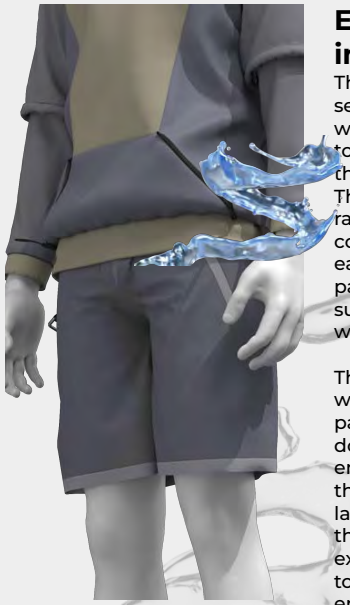
STAKEHOLDER FEEDBACK - FINAL

Feedback

During our second conversation, was impressed by the positive progress I had made in response to his previous feedback. It seemed like the refinements I had implemented were addressing many of the concerns and issues that had been identified earlier. We were feeling quite optimistic about the direction the project was taking.
However, as we delved deeper into our discussion, we stumbled upon a glaring issue in the design of the B2 and B3 modules.

This issue had the potential to undermine the entire purpose of these modules, which was to mitigate problems associated with water ingress. In essence, the very modules designed to solve the water ingress problem were themselves vulnerable to water-related issues.

OLD

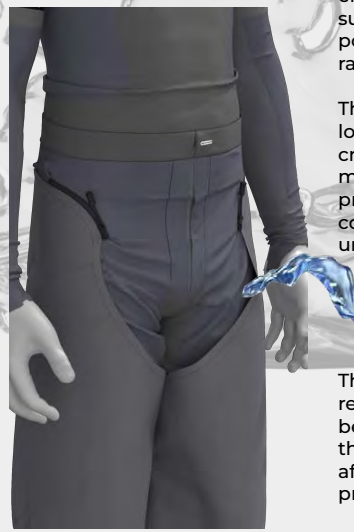


Ease of water ingress - HOW

There is no protective seal where the waterproof pant and top module connect to the base module shorts. This means that during rainy or stormy conditions, water can easily seep into the pants, making them susceptible to getting wet.

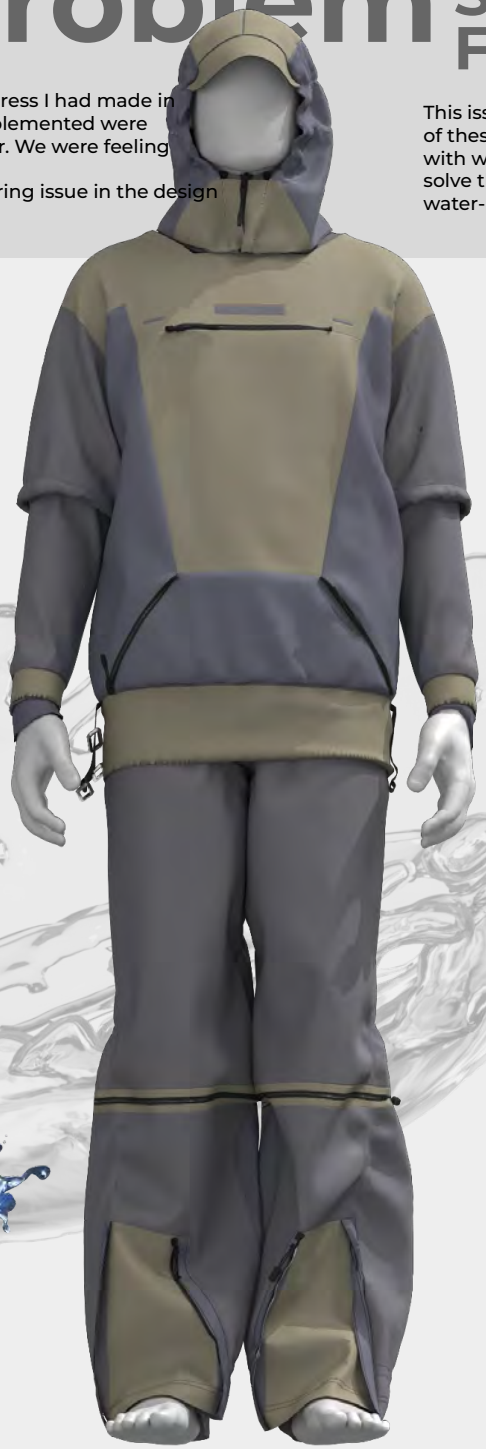
The upper module, which includes the top part of the garment, does not extend far enough to fully cover the crotch area. This lack of coverage leaves the crotch region exposed and vulnerable to various environmental factors, such as cold air or potential moisture from rain or other sources.

The pant module has a loose fit around the crotch area, which means it doesn't provide optimal coverage for the shorts underneath.

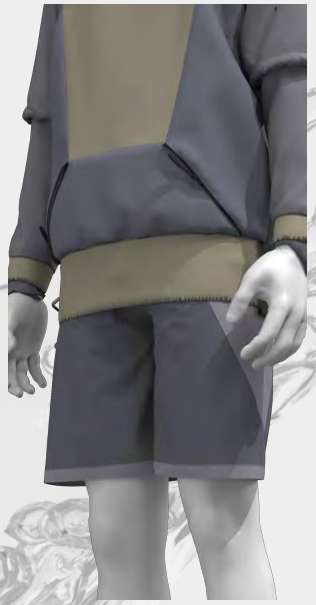


This looseness can result in the shorts being exposed more than desired, potentially affecting comfort and protection.

WATER CAN ENTER



REFINED



Ease of water ingress - SOLVED

The absence of a protective seal at the juncture of the waterproof pants and the top module with the base module shorts has been addressed. This integration ensures that, even in inclement weather conditions such as rain or storms, water no longer infiltrates the pants, thereby preserving their dryness and effectiveness.

The protective rim or cuff at the lower part of the B2 module has been extended to provide additional coverage for the crotch area, preventing any moisture or liquid from penetrating into the crotch area.

The connection between the B3 module and the pants has been redesigned to create a snugger, more secure fit. Elastic elements have also been integrated to guarantee a tight seal.

WATER CAN'T ENTER

Refinement

storage method for the unworn modules?

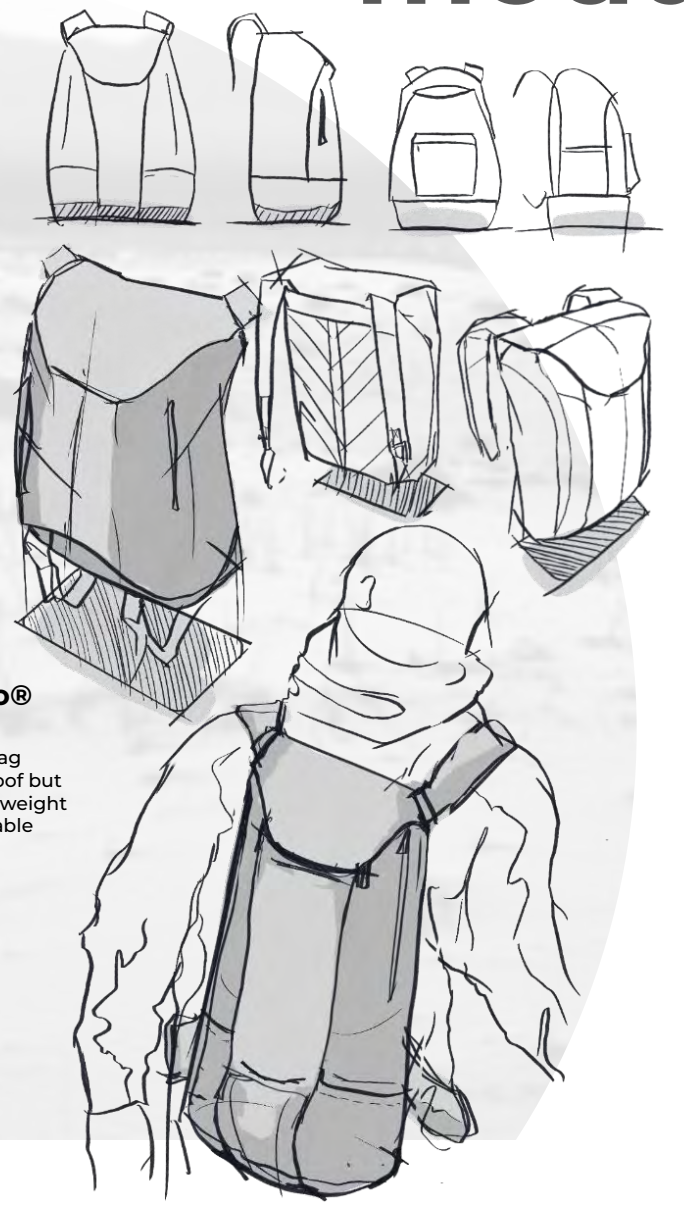
Top open design
Allows bag to be fully packed but still easily closable when stressed. Modules can be tightly packed from bottom to top and easily accessed when needed

Flexible design
Ensures that bag can adapt to a larger size when full of modules, but can also fold in on itself to create a lower profile when needed.

Side cargo pockets
Allows for other cargo than modules to also be carried in the bag, like gloves or keys, ect

Elasticated exterior pocket
Allows easy access for the carrying of more conveniently needed cargo like food water for example.

Gortex-Pro® outer
Makes bag waterproof but still lightweight and durable



Refinement

How is it constructed?

Unfortunately, due to the early stage that the CLO3D program is in, I was unable to export flat patterns for my visual communication.

NYLON
- Breathable
- Comfortable
- 4 - Way Stretch
- Not durable around seems.

Cotton reinforcement
- Durable
- Strategically placed around zip systems to increase durability

Gortex-Pro® outer
- Durably waterproof
- Breathable
- Completely wind proof
- Very rugged
- Recycled and solution dyed

Linen inner
- Breathable
- Sweat wicking
- comfortable

Gortex-Pro® outer
- Durably waterproof
- Breathable
- Completely wind proof
- Very rugged
- Recycled and solution dyed

Down stuffing
- Higher warmth-to-weig ht ratio than synthetic insulation.
- Very compressible.
- Very durable; can last for decades.

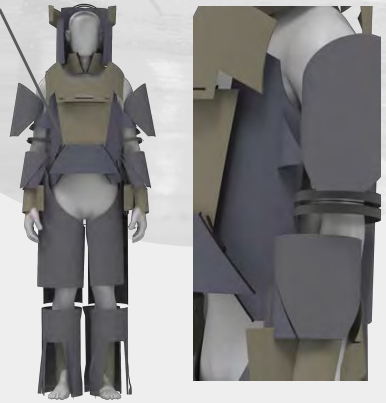
Polyester inner
- Does Not absorb moisture
- Insulating
- comfortable

HOW?

Breathable mesh material is strategically incorporated under the armpits and along the sides of the torso, ensuring effective ventilation and comfort. 120 -150 gsm is used where fabric needs to be breathable and 160 - 200 is used where fabric needs to be strong and durable.

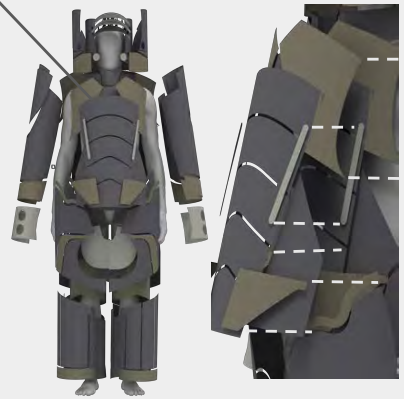
HOW?

The use of waterproof material rings plays a crucial role in preventing water infiltration by establishing a tight seal. Additionally, waterproof seam tape is employed to effectively seal other seams.



HOW?

While the construction of these modules may seem complicated, the use of double or even triple layers of materials is a common practice in the design of cold-weather outerwear. These multiple layers serve essential purposes such as enhancing insulation and creating baffles.



Refinement

Why the change in colour pallete?

homogenize

camouflage

cohesivity

why?

Cohesivity in colour is paramount in the modular clothing system for several reasons, so I have integrated a cohesive colour palette.

- Maintaining a consistent colour scheme across various clothing modules ensures that all these different pieces can be effortlessly mixed and matched. This cohesivity simplifies the process of creating outfits and expands the possibilities within the modular system. It allows the wearer to easily pair different modules, resulting in an extensive array of combinations that do not clash aesthetically.

- Using subdued, urban colours can help individuals blend into their surroundings and avoid standing out, which can be especially important for people facing the challenges of homelessness. These colours can also make it easier for individuals to mix and match their modular clothing pieces without the risk of clashing or drawing undue attention. Such a colour palette ensures that the focus remains on the practicality and functionality of the clothing and the aesthetics, rather than only the aesthetics, which is crucial for individuals struggling to meet their basic needs.

-

Refinement


B
A
C


B


A


C


A1
B1
C1
B2
C2
B3
C3
A2
A
B
C


A1 - A2 - B3


A1 - A2 - B2 - C3


C1 - A1 - A2 - C3


A1 - A2 - C2 - B3


SYSTEM*
SYSTEM
SYSTEM
SYSTEM
context
B
BAG
A
C