

LUNA

JUNE 2024
MA4-ID6

AALBORG UNIVERSITY

A CARRYCOT WITH EXTENDED POSSIBILITIES



AMALIE KONDRUP MADSEN
CHRISTIAN NYLANDER ØROM
LASSE BLUMENSAAT REASMUSSEN

TITLE PAGE

PROJECT TITLE

Luna – A CARRYCOT WITH EXTENDED POSSIBILITIES

PROJECT THEME

Next generation pram - redesigning the carrycot

PROJECT TEAM

MSc04, team 6

Industriel Design

Department of Architecture & Design

Aalborg University

REPORT

Product report

PROJECT PERIOD

01.02.2024 – 30.05.2024

MAIN SUPERVISOR

Linda Nhu Laursen

TECNICAL SUPERVISOR

Lars Rosgaard Jensen

NUMBER OF PAGES

24

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INTRODUCTION

Becoming a parent is a major upheaval in anyone's life. In addition, there is a lot of practice and the purchase of products that are both necessary and a luxury to have in the new everyday life. One of these key products is the pram, which has been essential for parents for over a century. As society and the needs of parents have developed, the pram, its aesthetics and function have to some extent followed suit. However, the traditional pram, which for the vast majority of families is essential for baby's daytime naps, needs an upgrade to remain relevant in modern parenting.

As first-time parents on maternity leave, daily life involves taking care of their 0-1-year-old child, where activities, stimulation and naps range from indoors at home to outdoor trips in the neighbourhood or over longer distances. Around 34% of Danes live in apartments, a number that has been increasing over the last number of years (Danmarks Statistik, 2024). Many families, including new parents, live in apartments for their convenience and central location, despite space and storage challenges. At the same time, there is also a trend among parents where the baby is tucked in for its daily naps indoors in the safe confines of the home and then transported out to the pram, as the fresh air is still an important priority for the child's nap.



PROBLEM FRAMING



The Danish norm and recommendation states that babies should nap outdoor. Looking at the parents' routines today, they tuck in their babies indoors before placing the baby in the pram. This results in the parent lifting their baby back and forth, up and down stairs multiple times a day. As they want to have the most comfort for themselves and their baby, they end up spending

money on additional transport equipment. This contributes to the large amount of baby products that parents have to consider in the child's first year of life. Being bad both for the environment, the baby and the parents uncertainty in their new role.



LUNA

Luna is designed to make the everyday life easier for the parents and provide comfort in the transition before and after the baby's daily nap. Luna uses simple principles such as narrowing at the bottom and a shoulder strap to ensure easy and flexible transport of the child. This especially provides a freedom in everyday life for the families who face challenges in the stairwell in their apartment building. In an everyday life with several daily trips with a 0-1-year-old child up and down the stairs, Luna provides support for the child with the ergonomically firm mattress, rigid sides, and sewn on apron, so that the child can lie comfortably and securely during the entire transport.

The new carrycot with extended carrying possibilities!



CARRYING LUNA

By carrying the carrycot on your shoulder, the weight is efficiently distributed to larger muscle groups in your back, making lifting significantly easier and more comfortable. Luna weighs less than five kg and, with its length of 85 cm, has room for a child up to the age one. The integrated handles offer extra stability when needed, ensuring effortless handling. They further ensure that Luna can be easily moved around inside the home and positioned correctly when mounted on the frame.

When the shoulder strap is not in use, the elastic at the bottom of the strap ensures that it lies close to the side of the carrycot. This way it is also always close at hand when the baby needs to be moved in or out. The length of the shoulder strap is easily adjusted by pulling the strap or lifting the adjustment buckle. Comfort is further ensured with the added padding on the strap.





LUNA INDOOR

For Luna, both aesthetics and functionality are an essential part of the design, as Luna both lives inside the home and on its frame outside. Indoors, the pram must fit harmoniously into the interior of the home. The shape and choice of materials make it suitable for use in different rooms of the home with its rounded shape and various features. The plastic shell is easy to clean, and the shape of the feet gives an almost floating appearance, which means that it can be placed without any further thought wherever you want to tuck in your child. Luna is suitable for both standing on the sofa or the dining table without fear of scratches or transferring of dirt.

Likewise, Luna's fabric reflects both its indoor and outdoor use scenario. The colors have been chosen so that Luna fits in well with the often calm shades of the Scandinavian home, while the surface expression of the fabric both appears slightly glossy without stealing focus.





LUNA USAGE SCENARIO



TUCK IN INDOORS

The insert is laid out and the baby is placed on the mattress, where clothes can be changed and get ready for a nap. If the carrycot has been folded together, the braces are pulled back up and the insert with the baby is lifted into the carrycot, where the baby lies safely until the parent is ready to go out the door.



SAFE TRANSITION OUTSIDE

Luna is carried out the door and down the stairs safely resting on the shoulder and with one hand on the handle for extra control. With the canopy down, there is a full view of both the child lying in Luna and the steps, so there is always the opportunity to be aware of the situation.



TAKE A STROLL OR STAND IN THE SHADE

After the frame has been found, Luna is placed so that the bottom mount clicks into the mount on the frame. Luna is now ready for a walk in the area, running errands in town or standing still in the fresh air while the child takes a nap.





LUNA FEATURES

SHOULDER STRAP

Elastic at the bottom of the strap ensures that it lies close to the side.

CANOPY HINGE BUTTONS

A canopy hinge button is located on the inside on each side. The buttons requires simultaneous pressing to fold the canopy down.

ROOM FOR THE BODY

Narrowing ensuring the right placement and free movement of legs and "hips".

BUTTONS & MAGNETS

Magnets and buttons are strategically placed to secure the apron snugly. Magnets keep the apron close to the foot end, ensuring easy access, while Fid-lock magnetic buttons attach the windscreen to the canopy keeping out the cold weather.

APRON ZIPPER

The waterproof centered zipper provides easy access to the child.



CANOPY MOUNTS

The canopy mount facilitates easy attachment and removal of the canopy from the carrycot.

RELEASE BUTTONS

Release button

The release button on each handle requires simultaneous pressing to lift Luna off the frame.

HANDLES

The handles feature leather on one half for enhanced grip and comfort.

ADJUSTMENT BUCKLE

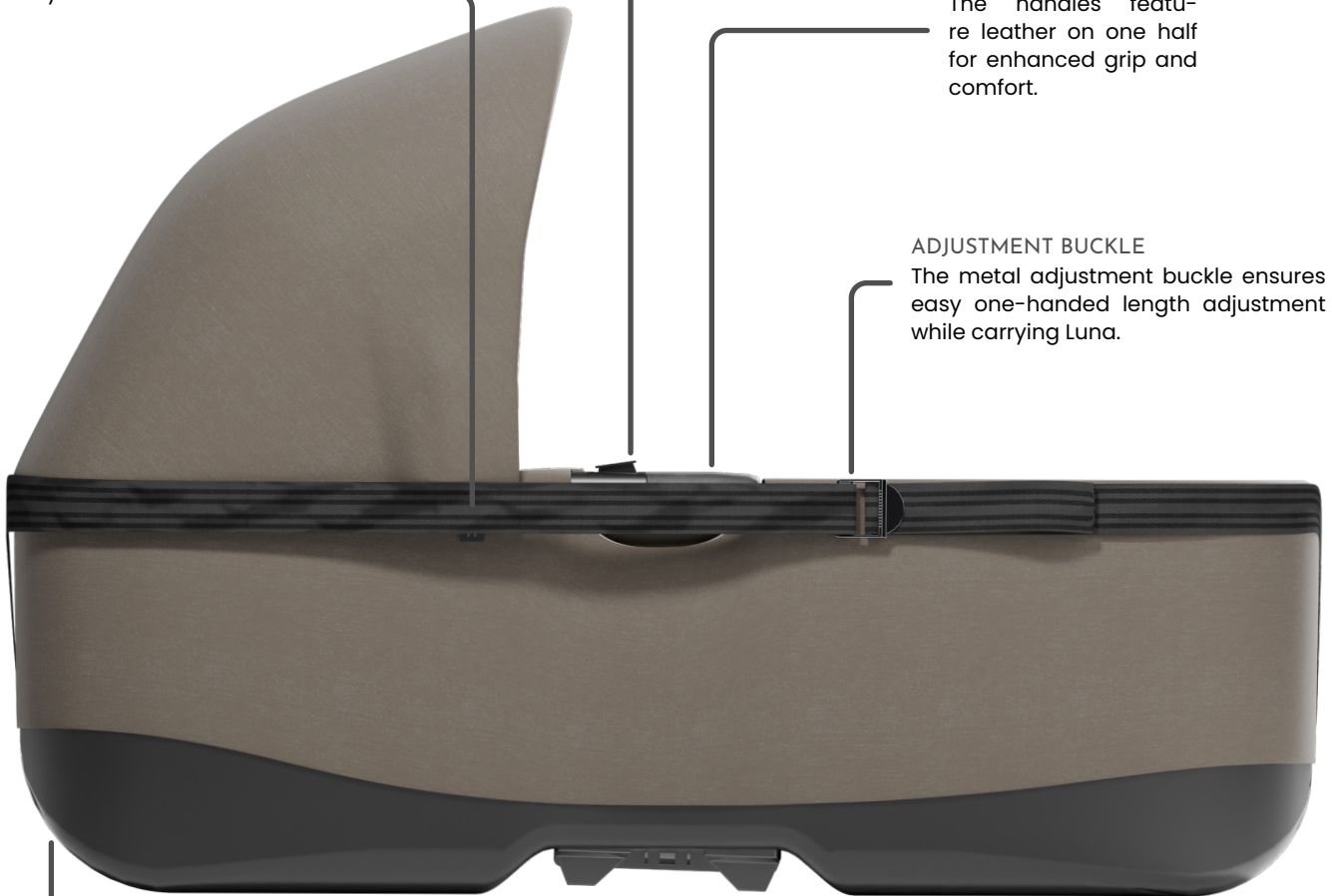
The metal adjustment buckle ensures easy one-handed length adjustment while carrying Luna.

PLASTIC BOTTOM SHELL

The bottom shell signals robustness and durability and has a rounded shape with a dynamic expression.

ROUNDED FEET

The size and design of the feet ensure that the frame mount is protected and gives Luna a rounded and floating appearance.



LUNA COLOR VARIANTS

Luna is available in a selection of different classic and modern colours, which have been selected with a focus on being able to fit in with the often calm shades of the Scandinavian home and outdoors on the black frame. The starting point is based on Odder Barnevognsfabrik's current color palette. Luna is therefore available in the classic colors: black melange, navy blue and sand, and the more timely and "more colorful" colors: dusty green and a burnt brown. These colors have been carefully selected to ensure that Luna is both practical and stylish and can be integrated into the home of a modern family with small children. Luna harmonizes with today's trends and needs without compromising on the tradition of Odder Barnevognsfabrik.

BLACK
MELANGE

DUSTY
GREEN

NAVY BLUE

BURNT
BROWN

SAND



SAND



DUSTY GREEN



BURNT BROWN



BLACK MELANGE



NAVY BLUE





85 CM
LENGHT

27 CM
HEIGHT

33 CM
WIDTH

LESS THAN
5 KG

WHAT IS IN THE BOX?

When Luna arrives in the home, it is disassembled into its primary parts. These are easily assembled, and Luna is thereby ready for use immediately. The only thing that needs to be done is to fold up the carrycot, put on the canopy, place the insert, unfold the frame and put on the wheels. The frame can then be stored in either the hallway or a shed outside, while Luna can be placed where it makes sense and is always close at hand.



01

ODDER VIDA 2
12.999 DKK



02

ODDER NORTH
9.999 DKK



03

ODDER SAGA
8.499 DKK



04

ODDER LIFT
1.799 DKK

THE ODDER COLLECTION

Odder Barnevognsfabrik's current collection offers three main pram models: VIDA 2, NORTH and SAGA and a baby lift. These prams are designed with a commitment to quality, design, safety and comfort, reflecting the company's core values. (BabySam, 2024a). The collection is available in a range of colors including black, black melange, navy blue, dark green and sand.

The materials in Odder's prams are carefully selected to ensure durability and comfort. The outer textile is premium quality, made from oxford material with an integrated membrane for wind and waterproofing as well as breathability. This ensures that the child is kept dry and comfortable. It consists of 50% recycled material and 50% virgin material, which provides exceptional durability. The prams are designed to withstand daily use, while providing a comfortable and safe environment for the child.

Priced in the premium segment, Odder's prams are positioned as an investment in quality and longevity, appealing to parents who prioritize both tradition and functionality. (BabySam, 2024b).

IMPLEMENTATION PLAN

For this implementation plan, the procedure of the case company Odder Barnevognsfabrik, which is owned by BabySam is investigated. The starting point has therefore been similar products that Odder has previously published. The plan is based on a col-

laboration with Odder and will result in either a partnership or sale of all rights to the product proposal. Introducing Luna to the market with an expanded use scenario under the Odder brand a positioning in the mid- to high-end market segment seems sen-

sible. From this considerations and a comparison with existing prams and combi prams, it is estimated that Luna will have an initial selling price of 9.500 DKK. Fitting right in the price range of Odder products already on the market and to come.

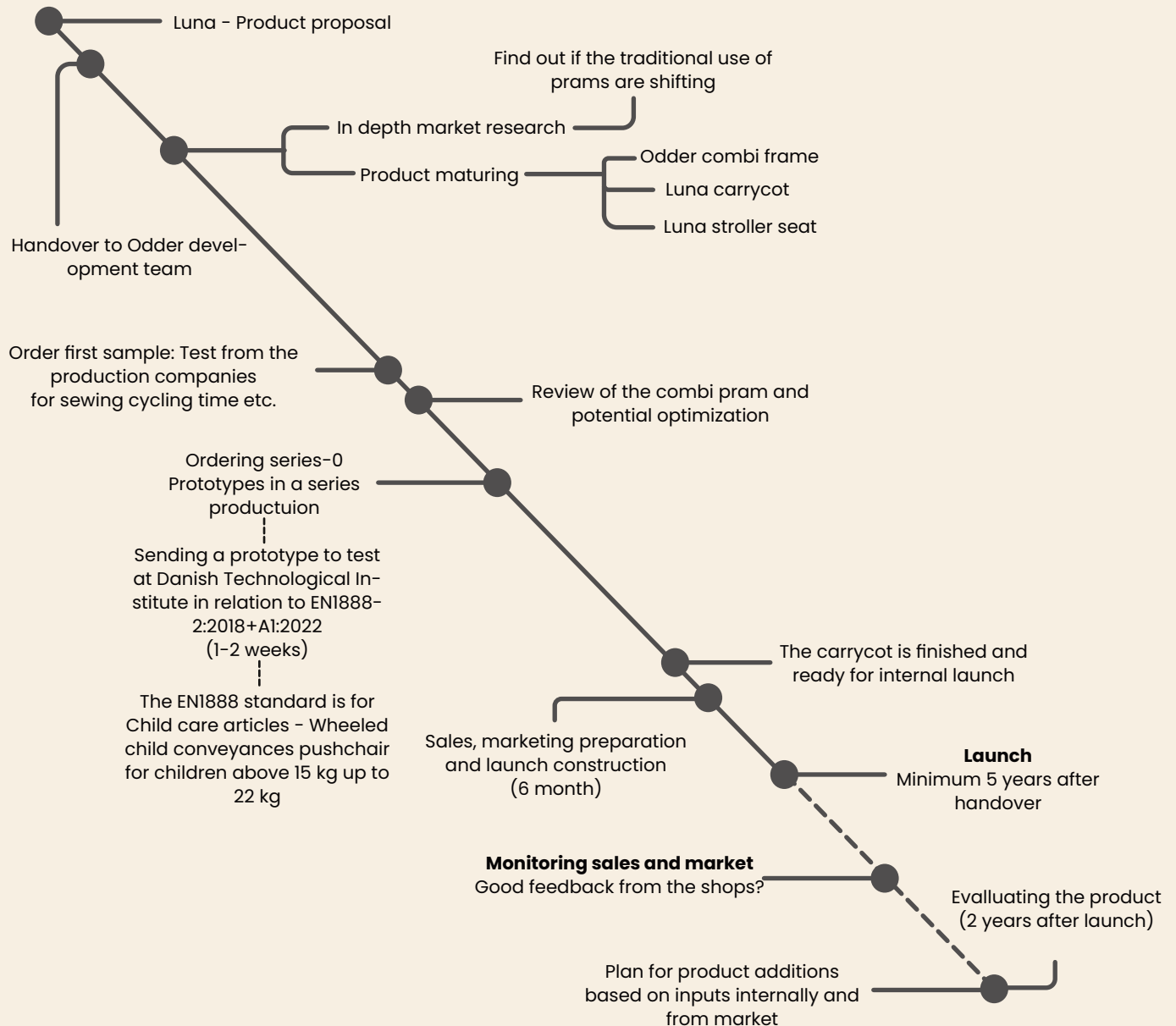




ILLUSTRATION LIST

All illustrations that are not listed in the illustration list are own photographs and renderings.

Illustration 1: *North barnevogn - dark blue* [photograph]. (n.d.). BabySam. <https://www.babysam.dk/north-barnevogn-dark-blue>

Illustration 2: *Odder Lift - black melange* [photograph]. (n.d.). BabySam. <https://www.babysam.dk/lift-black-melange-onesize>

Illustration 3: *Odder Vida 2 - black melange* [photograph]. (n.d.). BabySam. <https://www.babysam.dk/odder-vida-2-black-melange>

Illustration 4: *Saga barnevogn med faste forhjul* [photograph]. (n.d.). BabySam. <https://www.babysam.dk/saga-barnevogn-med-faste-forhjul>

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BabySam. (2024b). *Brand spotlight*. <https://www.babysam.dk/maerker-odder?page=1>

Danmarks Statistik. (2024). *Personer i boliger*. Danmarks Statistik: <https://www.dst.dk/da/Statistik/emner/borgere/boligforhold/personer-i-boliger>



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LUNA



PROCESS REPORT

AALBORG UNIVERSITY
JUNE 2024 MA4-ID6

THE PROJECT IS DOCUMENTED IN FOUR PARTS.

Product report: A presentation of the proposed solution, Luna

Process report: A presentation of the designprocess behind Luna

Appendix: A collection of worksheets, illustrations and calculations

Technical drawings: A collection of parts drawn to scale and bill of materials

It is recommended that the project is read starting with the product report and continuing with the pro-cess report afterwards. The appendix and technical drawings can be used alongside reading the process report for further elaboration, data and technical understanding.

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MAIN SUPERVISOR

Linda Nhu Laursen

TECHNICAL SUPERVISOR

Lars Rosgaard Jensen

NUMER OF PAGES

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Ol The team

MOTIVATION

The basic motivation for writing a master thesis about the pram is driven by several factors. For three future industrial designers, the first important point was to work with a product that is universally known by most people and that emphasizes both aesthetics and function. Furthermore, it was exciting to work with a consumer product in a mature market, which provides a unique opportunity to innovate within a well-established field. Finally, it was important that it could be imagined to be a solution proposal we would be proud to include in our personal portfolio and represent a balance between design and usability.

Amalie Kondrup Madsen

Christian Nylander Ørom

Lasse Blumensaat Rasmussen

ABSTRACT

This project explores the development of a versatile carrycot designed for both indoor and outdoor use, aiming to simplify the daily routines of first-time parents and enhance their babies' sleep quality. Grounded in user research and insights from Odder Barnevognsfabrik, the project identifies the critical need for a seamless transition between indoor and outdoor environments for babies' daytime naps.

Key features of the proposed carrycot, Luna, include easy folding, an adjustable shoulder strap, ergonomic design, and materials suitable for indoor and outdoor use. These features address the parents' needs for practicality, comfort, and durability, reducing reliance on multiple add-on products and re-establishing a strong product-user fit.

The research highlights a behavioral shift among Danish parents, indicating a declining need for traditional full-length prams and an increasing preference for more compact, multifunctional solutions. The proposed solution, Luna, is designed as a step in a more innovative direction for the case company Odder, as it combines elements of both traditional prams and combi prams, offering a user-friendly and integrated solution. However, the success of this new product will depend on changing consumer habits, necessitating further market research to demonstrate its advantages.

Overall, this project proposes a modernized approach to child transport, aligning with Odder's commitment to quality and design, and catering to the evolving needs of modern parents.

ACKNOWLEDGEMENT

A big thanks to our main supervisor Linda Nhu Laursen, for letting us choose this type of project and keeping the faith in us even when we looked a bit tired. Thanks for the guidance, motivational speeches and support when the process was tough. Likewise, thanks to our technical supervisor Lars Rosgaard Jensen, who has kept us optimistic and guided us even before we had a concept.

A special thanks is to be given to Fie Elvira Storm - Product manager at Odder, BabySam, for the insights, product-, production- and business-related knowledge. It has been interesting and educational to get feedback and evaluation on our framing and concepts continuously in the project and get a "real-life" perspective on the design process. Additionally, their contribution of pram components greatly enhanced our understanding of prams and have been invaluable regarding testing and model building.



Fie Elvira Storm
Product manager



O2 Stakeholder

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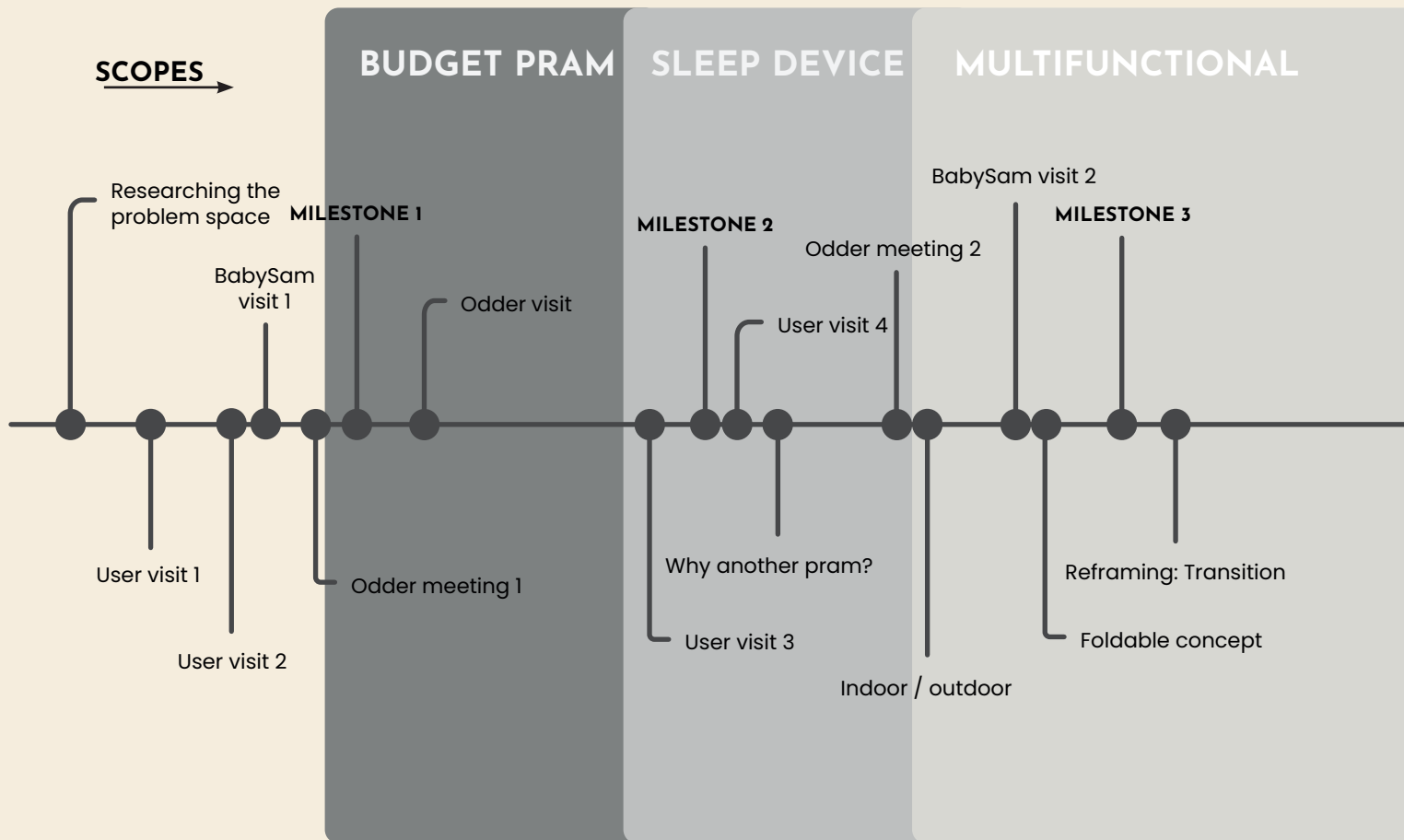
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TIM



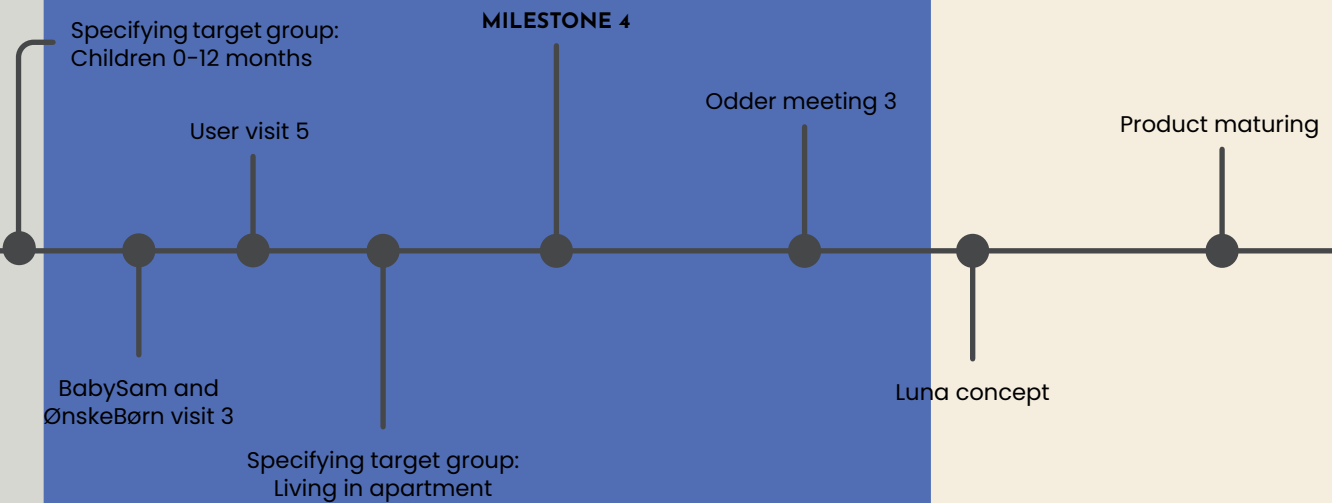
The design process behind this thesis project has been characterized by confusion and many different scopes along the way, which has resulted in several research phases. The process has primarily consisted of user research and framing of the right issue to justify the development of yet another consumer product in an already mature product category.

The project has had a major focus on the product's design and strategic positioning as well as on re-establishing a no longer adequate connection between user and product. Since the goal was to work with and challenge a mature product category targeted at the consumer market, the scope of the project was adjusted continuously as new insights were gained. This meant that work was done in parallel with both the problem space and the solution space, and the project was adjusted and specified continuously.

Although illustration 3 visualizes the process as a linear path towards the proposed solution, this has been far from the case. The design process reviewed can best be described by "the Fuzzy Front End", which deals with the early and often chaotic phase of product development (Haase & Laursen, 2018). In this project, this "fuzzy" phase has extended significantly further into the process than in similar projects, which has been both a major point of frustration and a learning process.

MELINE

TRANSITION CARRYCOT



03 Process timeline

READING GUIDE

The process report outlines the different findings, considerations, and choices taken throughout the project. This is split up into nine phases based on focus areas: Framing, the pram, market, users, multifunctional, the new carrycot, production, business and epilogue.

In the report the following terms will occur:

Carrycot: The upper part of the pram also called "pram box"
Full length: 97 cm internal dimension in the lengthwise direction

In the report the following symbols will occur:

- ! Insight
- + Demand
- X Specification

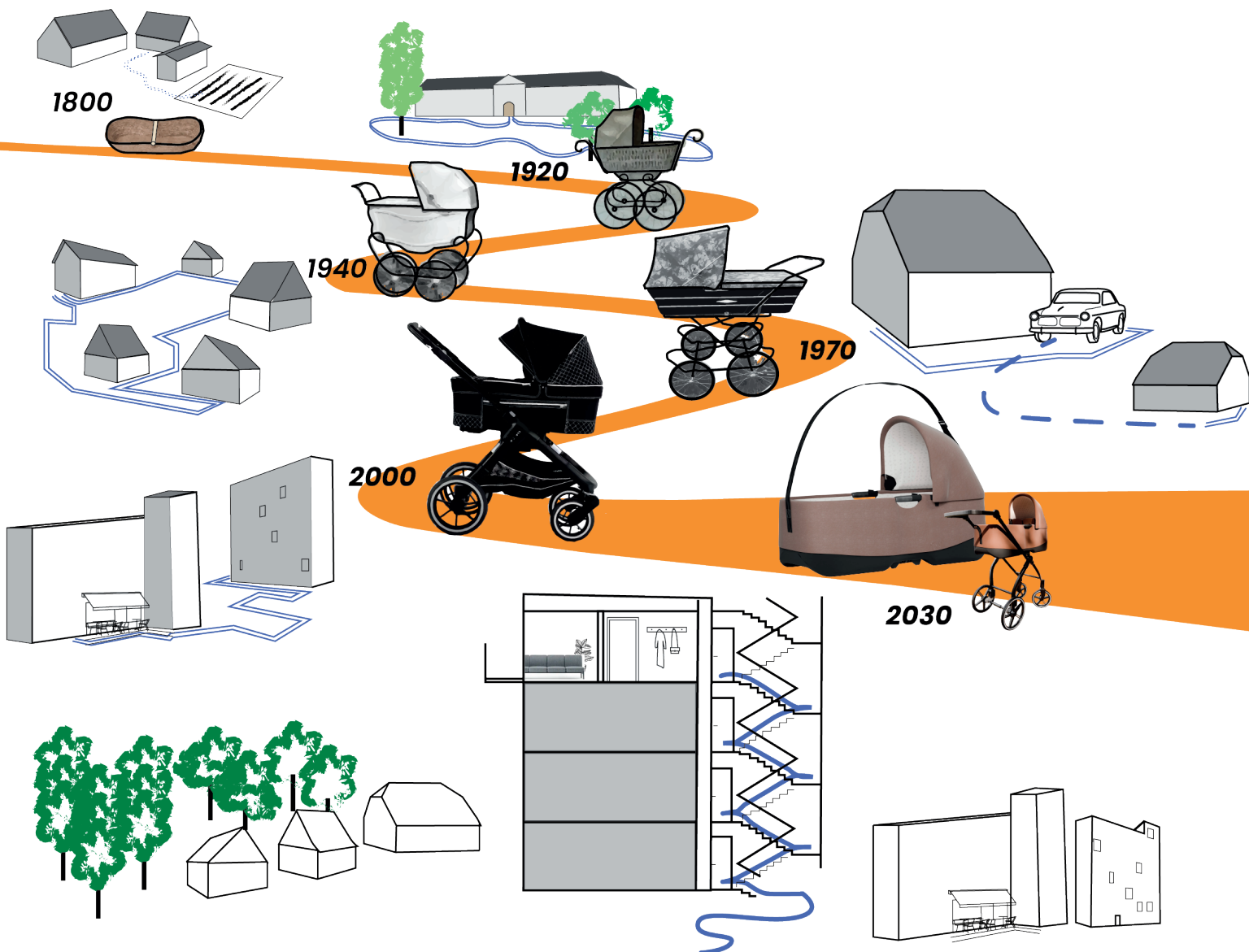
All references are made with The Harvard Method and a complete list of references and illustrations can be found in the back of the report alongside an appendix index.

INTRODUCTION

The pram has long been an important part of parenthood, and over the past 100 years it has been part of the everyday life of new parents in various ways (illu. 4). From the very beginning, it has been about taking the child with you, first in the field, then in the park, in the neighborhood, on longer trips by car and today we see prams in restaurants and cafes around the city. But one thing the pram haven't solved yet is the transport from inside the living room and out the door. Here it can be seen that there has been an increasing tendency for more new products emerging in the baby industry – to meet the routines within the four walls of the home and out to the pram. Where parents used to have a cradle and a carrycot as framework for sleep during the day and at night, we today see nests, side cribs, motorized baby hammocks, swaddles, sleeping backs, and soft lifts to take care of the infant's sleep between zero and one year of age. The carrycot, as the original product for napping during the day, needs an upgrade if to retain its value in parenthood.

Pram manufacturers are currently focusing on the frame and how it can be optimized and utilized for extended use, with the latest principle of a combi pram. This can be seen as a result of, the pram being left at home as soon as the child can sit in a stroller. This evolution causes the traditional carrycot to lose even more value with a short usage scenario of only nine months. In order for the carrycot to continue being relevant, the parents need to be able to comfortably handle the carrycot off the frame and all the way into the home – even if they live on the fourth floor without an elevator. This makes it important to solve the storage in the home as well and not least where the napping ritual starts and ends with undressing and dressing for the nap.

This thesis aims to explore the multi product need that have occurred, and how the pram's carrycot can be integrated in indoor routines in order to make a stronger product-user fit.



FRAMING

01 SCOOPING THE DESIGN PROBLEM

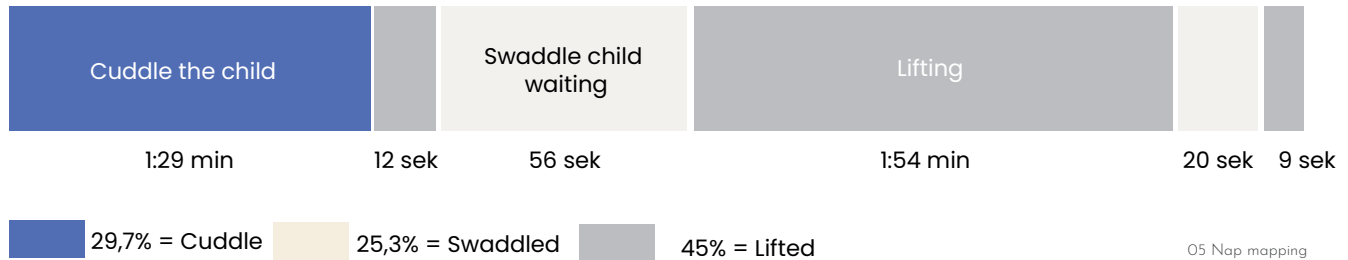
This phase describes the initial framing and research areas that create the foundation for the project. This is mainly based on desktop research, interviews, and hands-on research. Furthermore, the phase forms a common understanding of the target group and product category, helping to identify consumer needs and preferences, paving the way for a strong product-user fit (Haase & Laursen, 2023). Additionally, research of the market size is conducted followed by exploring the lifestyle and essential baby products for new parents.

PROBLEM FRAMING

The Danish norm and recommendation states that babies should nap outdoor. Looking at the parents' routines today, they tuck in their babies indoor before placing the baby in the pram. This results in the parent lifting their baby back and forth, up and down stairs multiple times a day. As they want to have the most comfort for themselves and their baby,

they end up spending money on additional transport equipment. This contributes to the large amount of baby products that parents have to consider in the child's first year of life. Being bad both for the environment, the baby and the parents uncertainty in their new role.

PREPARATION FOR A NAP



As seen above on illustration 5, there is a substantial amount of time spent on lifting the baby before and after the nap. In fact, the time where the baby is lifted combined last almost as long than the other step of the nap preparation. The graph above shows the preparation steps map out in time slots. The nap itself last around 1-3 hours but this is where the pram still fulfills user needs and are thereby left out.

This project will focus on eliminating the mismatch between user routine and the need of workarounds product to have a comfortable transitioning, for the baby and the parent, before and after a nap in the pram.



WHO ARE THE PARENTS

The target group are first-time parents on maternity leave. They have split their maternity leave so there is only one parent home most of the day. The everyday life of the one being home alone with the baby mainly consists of taking care of their 0-1-year-old child with entertainment, learning, naps, and trips out of the home. They live in apartments, which gives them a long distance to their necessary everyday tool, the pram.

MAPPING OF USERS DAY

When the parents assess is it time for nap they start preparing for the nap. This includes, relocating the lift, putting on additional clothes on and swaddling the baby. A lot of the activities around the nap happens indoor. The only thing that is important to do outdoor is the sleep. The nap routine happens reverse when the baby wakes up. **The nap routine is tracked.**

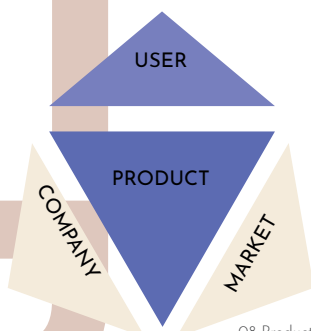
When cuddling the baby to sleep the parent spend a lot of time lifting the baby around before putting the baby in the pram. This includes for instance, a lift from the living room to det entrance, and outdoor from the ground to the pram and lifting the baby from inside to wherever the pram are placed outside. A lot of the preparation time is used on transporting the baby to the "transport" and napping product, the pram. Furthermore, time is also spent after the nap, since the baby and pram have to go back to where they were placed before. Due to the baby needing a nap multiple time a day the parents often skip storing the carrycot right, with the madras flip (BabySam, 2024a) and don't put away the babies outerwear.

The pram is designed for the last to step in the scenario a sleeping baby and a parent on the go, but is often used stationary, leaving only the sleep need covered by the current design.

PRODUCT-USER FIT

Although traditional prams serve their purpose, they lack the functionality needed in today's baby napping routine, adapting to the dynamic indoor and outdoor lifestyles of today's families. This gap is evident as parents often buy additional products like soft lifts or sleeping bags to handle the transition from the living room to the pram in the daily napping situation. These add-on products address immediate needs but do not integrate well into the overall parenting experience or focus on longevity. Despite being seen as a necessity, user data shows the pram don't have the same active role in the first year of the baby's life and are often left behind as soon as the child can sit safely in the stroller (app. 1).

To achieve a product-user fit, it is essential to understand not only the parents' explicit needs, but also their behavior, aspirations and wishes (Haase & Laursen, 2023). A well-designed pram should provide a safe napping space and seamlessly integrate into daily routines.



08 Product-user mismatches
(Haase & Laursen, 2023)

PREPARING

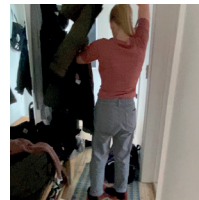
Putting close
on for nap



Baby wrapped
and ready



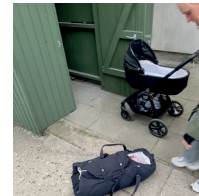
Parent getting
ready for a walk
outside



Lifting the baby
to the pram



Prepping the
pram etc.



Putting the lift in
to the pram



Walking



Sleep



SLEEP

Z

Z

Z

1-3 hours

AFTER

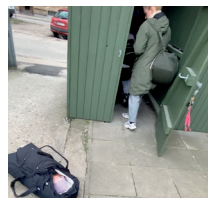
Child awake



Take the lift with
baby up



Set the pram
back in the shed



Lift the
baby inside



Removing extra
clothes



Leave the lift and
outerwear



07 User scenario

MARKET OVERVIEW

PRAM



09 Odder Vida 2

ODDER - VIDA
Price: 12999 dkk
Lay length 97 cm

Estimated use:
 Carrycot: 3 years

COMBI PRAM



10 Bugaboo fox 5

BUGABOO - FOX 5
Price: 10299 dkk
Carry cot length 80cm
Stroller: length 89
Estimated use:
 Carrycot: 9 kg or 6 mth.
 Stroller: 22 kg, around 4 years

STROLLER



11 Baby Jogger City Elite 2

BABY JOGGER - CITY ELITE 2
Price: 4499 dkk
Lay length 98 cm
Estimated use:
 Stroller: 22 kg, around 4 years

CLASSIC LIFT



12 Odder Lift

ODDER - HARD LIFT
Price: 1799 dkk (- madrest)
Lay length 30 x 77 cm.

Estimated use:
 Infant to 8 mth.

SOFT LIFT



13 Najell SleepCarrier

NAJELL - SLEEP CARRIER
Price: 1249 dkk
Lay length 80 x 25 cm
 Weight: 1,5 kg
Estimated use:
 Carrycot: 9 kg or 6 mth.
 To the baby begin to roll or crawl

SLEEPING BAG with carry cot function



14 Voksi Classic

VOKSI - CLASSIC
Price: 1999 dkk
Lay length 75 cm
Estimated use:
 Carrycot: 9 kg or 6 mth.
 To the baby begin to roll or crawl

THE MEANS OF BABY TRANSPORT

A traditional Danish pram, like Odders (illu. 9), typically features a full length, providing space for the baby to lie flat comfortably to the age of three years old. This prioritizes the baby's sleep and allows for comfortable rest. The stroller on the other hand (illu. 11) has a seat that is more upright, suitable for when the baby is older and wants to observe their surroundings. The stroller is also lighter, more compact and maneuverable. The newest addition is the combi pram (illu. 10) where a shorter lying position offers versatility by allowing the carrycot to be replaced with a stroller seat and, hence utilizing the same frame. The common reason why parent choose the combi pram is its lower price, lighter weight and smaller size than the traditional Danish pram. However, the shorter lying position in the carrycot means that the stroller seat must be used for outdoor naps, from when the baby is around six months old.

THE PORTABLE BABY INSERT

A classic baby lift (illu. 12) for prams is a traditional and rigid structure that provides a cozy and secure space for the infant to rest in the big pram. It typically features a firm base and sides, however, its design is bulkier and less adaptable to different situations. On the other hand, soft lifts (illu. 13) offer a more light-weight and flexible alternative where the foam sides provide a comfortable and cushioned environment for the baby. Soft lifts prioritize portability and convenience for the parents. Additionally, the enclosed sleep bag (illu. 14) with a carry cot provides a compact and portable solution for swaddling and transporting the baby. The wrapping design secures the baby and acts as a duvet, making it suitable for travel or outdoor use.

MARKET SIZE

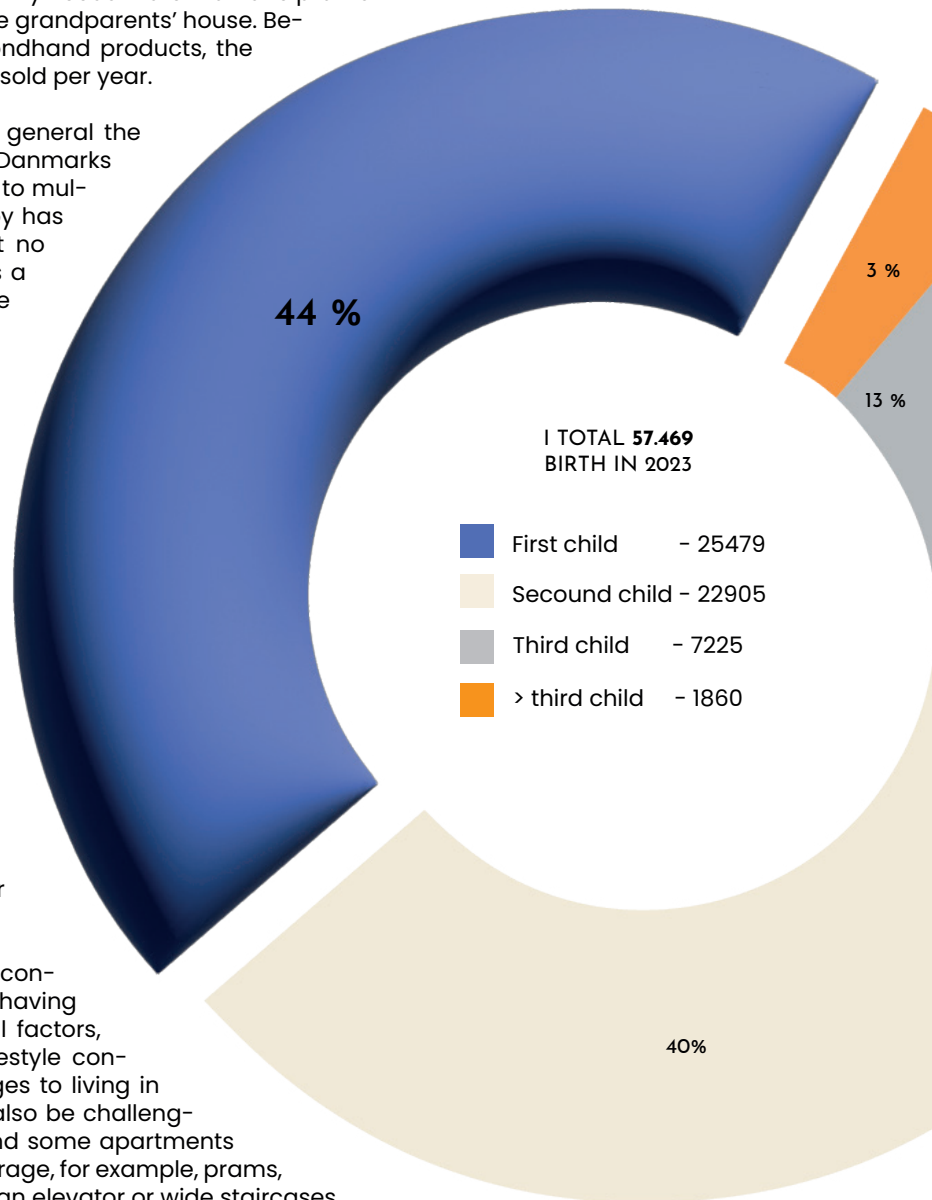
The overall birth number in Denmark are approximately 60.000 babies per year, where around half of the babies are first-born children. This means around 25.000 costumers contributes to the baby product market each year. Illustration 15 shows how births are distributed among the number of children the Danish mothers in 2023 has had. Based on the number of first-time mothers, the size of the market is around 25.000 families (Danmarks Statestik, 2024a). On top of that, comes the possibility that a family needs more than one prams e.g. for the balcony, the institution or at the grandparents' house. Being aware of the increase focus on secondhand products, the market contributes around 30.000 prams sold per year.

When looking at the first-time parent in general the average age of parents is increasing (Danmarks Statestik, 2024b). This has happened due to multiple factors, one of which is that the baby has become more of a planned project. But no matter the parents age and income, it is a common factor for the parents that the importance of the Project Baby, means they financial invest in their feature childs feature (Nebelong, 2015).

PARENTS LIVING IN APARTMENTS

Today, approx. 34% of the Danish population live in apartments (Danmarks Statestik, 2024c), and this number have slowly increased over the past 14 years (Danmarks Statestik, 2024d). Apartments are found in cities of all sizes across Denmark, and house different types of people, including young students, singles, elderly, couples, but also families who just had their first child.

For many families, it is not uncommon to continue living in an apartment even after having their first child. This is caused by several factors, including financial, geographical and lifestyle considerations. Although there are advantages to living in an apartment as a young family, it can also be challenges. Lack of space can be a challenge, and some apartments may have limited options in relation to storage, for example, prams, while far from all apartments have either an elevator or wide staircases, which is an advantage when you have a baby and equipment, that must be transport up and down every day.



15 Birth statistics 2023 (Danmarks Statestik, 2024a)

NUMBER OF PEOPLE DIVIDED BY HOUSING TYPE

anno 2023

3.500.000

3.000.000

2.500.000

2.000.000

1.500.000

1.000.000

500.000

0

Houses

Terraced and semi-detached houses

Apartment buildings

16 %
261077 persons

16 People living in apartments (Danmarks Statestik, 2024c)

USER LIFESTYLE

Having your first child is regarded as a significant project, irrespective of the parents' age, educational background, or life-style. It's a milestone that prompts substantial investments in baby products, underlining the notion that parenthood often today is a carefully planned life event. (Akselvoll,2023)

BABY PACKAGE

When becoming a parent, the newborn has a lot of new needs which leads to new routines and products to learn. There is not just a simple standard product that solves all daily tasks, which makes it necessary for parents to research, buy and opt out of a lot of products. Babycare mat, baby chair, playmat, baby alarm, car seat are just some among many other products. A common understanding of a baby package has been made, where the parents not only need a product in each of these categories, but there are also made a common understanding of which specific brand the products have to be (illu. 17-23). According to a health nurse there is a tendency that more and more products are bought before the baby is born, which makes parents easier to influence (app. 2). There is a tendency where parents follow and compare themselves to influencers on social media who advertise and show countless baby products. This is done in a way where parents can reflect on the style and way of life these influencers have and thus precisely these products are perceived as essential to being a modern parent.

Regardless of their financial standing, parents prioritize investing in quality items for their new child.



17 Products in the baby package

BABYCARE MAT



18 User pictures leander mat

DIAPER BAG



20 User pictures Kongslojd

PLAY FOAM



22 User pictures Legeskum

PLAYMAT



19 User pictures Hyggi

MODULAR TOYS



21 User pictures MODU

HIGH CHAIR

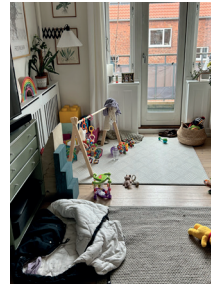


23 User pictures TripTrap stol

PROJECT BABY

User observation pictures shows (illu. 24 & 25) that parents are okay with making compromises with their own life in the wish to give their child enough. This applies both on a financial, mental and physically (app. 3, 4 & 5).

This emphasis on prioritization and convenience is reflected in everyday life, where product placement becomes integral. Examples of this could be where the “play foam” moves into the living room and replaces the coffee table (illu. 22), while the play mat replaces the carpet or fills as an extra thing in the room (illu. 19), demonstrating a prioritization to create a nurturing environment for the baby over the parents’ interior design style. Some prefers to keep the pram stored just outside the door or in the entrance (illu. 24) for easy access for naps or outdoor excursions.



24 User pictures



25 User pictures

“We have just now replaced the coffee table with the play foam so he can climb up and down the sofa himself” - Anne

“The biggest compromise is perhaps one’s freedom, which is just completely gone in these years” - Marie

DESIGN BRIEF 1.0

Through observation and analysis of parents and baby-products, the framing of the project has become clearer. The following three focus points have been listed, they together form the framework for this project.

HANDLING

- Lifting
- Convenience
- Safety
- Ergonomic

STYLING

- Transition from indoor to outdoor
- Outdoor climate

USE AND STORAGE

- Short-term
- Between naps

PROBLEM STATEMENT

“How to design a carrycot that can be integrated in the users’ indoor routines in order to make a stronger user-product fit for the pram?”



26 User picture

THE PRAM



02 WHAT IS A PRAM?

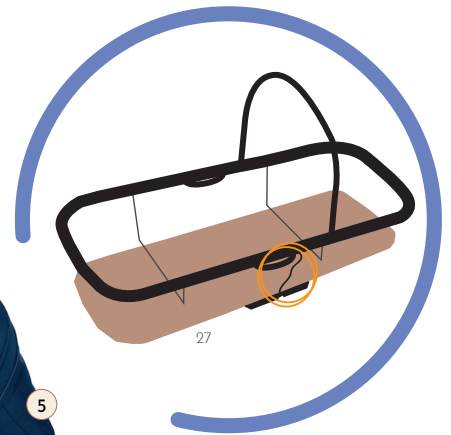
This phase describes the autonomy and history of prams delving into an understanding of the difference between prams, strollers, and combi prams to get an understanding of timely and timeless aspects (Barros & Laursen, 2022). Drawing inspiration from these insights, the design process starts on the spiritual level of the pyramid (Lerdahl, 2001), challenging conventional norms and reimagining the possibilities for pram design and features.

UNDERSTANDING THE FUNDAMENTALS

PERAMBULATORS ANATOMY

To understand the construction of current pram, the product architecture was investigated. Traditional prams can generally be divided into two components frame and carrycot (illu. 28 & 29). Each of the two components have some basic functions.

- 1 **WHEELS**
Four foam wheels of which the front wheels can be fix or able to rotate
- 2 **BREAK**
Blocks the back wheels with a split
- 3 **STORAGE**
Spacious shopping firmly mounted on the frame
- 4 **HINGE**
Give the pram the ability to fold (illu. 31). There are two types of frames, one with a solid frame which support the carrycot underneath and one that is center mounted (illu. 30).
- 5 **MOUNT**
Attachment points for the carrycot, witch lock the two parts together.
- 6 **HANDLE**
An adjustable part of the frame that can vary in height to accommodate the parent



! Very simple construction of the carrycot



POCKET
Integrated in the outer fabric, made for small items like the parents phone, a pacifier or baby alarm

APRON
Cover the carrycot to create a fully weather protected space for the baby

LOCKING MECHANISM
The handle releases the carrycot from the mount on the frame, due to a wire which release the lock (illu. 27)

CANOPY
Provides cover against rain, wind and sun for the baby

VENTILATION
Use to keep the temperature down on hot days

AWNING
For extra coverage against the sun during naps

The frame are mostly made of aluminum tubes, with a few plastic part e.g. the steer hinge, whereas the carrycot are mainly outdoor fabric, water coated and UV resistant. The bottom plate are made of either plywood, dens foam or plastic. The hole carrycot is stuffed in traditional Danish prams, to keep out the cold (BabySam, 2024b)



31

STORAGE

All the parts are carefully designed to be packed together so that the pram can be packed up and brought into a car. By removing the wheels, it can in some cases be minimized all the way down to hand luggage size H 850 x L 315 x W 515 (Cybex, 2024). The carrycot can usually not be folded quite as much, due to the solid plate at the bottom (illu. 31) which en-

sures a firm base for assembly. Furthermore, the carrycots, canopy and mattress limit the compactness.

However, the parents demands for the pram change due to time and trends. To fully understand the history of the pram the team needs to analyze the history further.

PRAMBULATER HISTORY

USER NEED

Bringing your baby outside to the field & around the home

Showcase your familys wealth and health

Provide all kids with fresh air

Comfort to the baby and the parent



1820 1900 1920 1940

FUNCTION

Handles in both ends and reversible canopy

Outdoor napping
Affordable and weather proceted

Weigth reduction and full layinglength

MATERIALS
CARRYCOT
FRAME
WHEELS
DETAILS

Braid bast	Wood	Waxed cloth	Steel	Wood	Glas fiber
nickel plated	chrome steel			Steel tubes	
Iron		Solid rubber		Rubber	
Porcelæen	Leather	Rubber		Textile	

ADD-ON /
EXTENDED USE

1920' The govern-
ment recomend to
sleep outside



SPIN OFF

The history and evolution of the pram has a great influence on how and why it looks the way it does today. Therefore, the evolution of "wheeled child conveyances" through time has been mapped to gain an understanding of timeless and timely aspects in the design (Barros & Laursen, 2022).

The pram was initially designed for transport, mainly being short walks in the park, where it later it was found that fresh air was essential. It later evolved for longer use and became a protective atmosphere during sleep. It was then adapted for car transport and city walkways. Materials have changed to create a lighter, more breathable, and durable pram without unwanted chemicals. Likewise, understanding the integration of various functions complying to different needs over time is essential. Despite these changes, the overall look of the pram has remained largely unchanged since its invention in the late 1800s.

The pram came to Denmark around the 1900's, serving as both a functional item and a status symbol for the bourgeoisie, strolling around newly laid green promenades in the growing cities. This pram had handles on both ends and elegant and heavily ornamented design. In the interwar period, 1920-1940, increased enthusiasm for the outdoors and fresh air increased happened parallel with the Danish state recommendations for children to sleep outside. This led to a deeper, more protected pram design with a low frame, rubber wheels, and a windscreen, allowing children to sleep outside year-round until age two.

After World War II, several American trends came to Denmark also influencing the Danish pram design, shifting from

cradle-like shapes to streamlined forms inspired by the Volkswagen. Practical materials like fiberglass, steel tubes, and textiles became common in the 1950s, resulting in lighter, more maneuverable prams. The carrycot was extended to fit children up to the age of three, necessitating a lift for smaller children to meet their need for swaddling and security.

In the 1960's, prams became collapsible to fit in the family's new investment, the car, expanding their use beyond the home. This shift responded to the growing demand for parental mobility and flexibility. Through the 1980s and 1990s, luxurious details like inflated wheels, adjustable handlebars, and ventilation were added for enhanced comfort. The latest change in the pram's use and appearance comes when STOKKE in 2003 published a center-mounted pram, where the classic carrycot could be replaced with both a stroller seat and a car seat (Stokke, 2024) . The last decade, more combi prams have emerged, some doubling as sibling strollers with expandable frames. Additionally swivel wheels have almost become essential for navigating the increasingly compact cities. (Maria, 2016) (app. 6)

The distances we transport our children have increased, and brand identity has become crucial. Today's city strolls and cafe visits expose our baby products to other parents, enhancing brand awareness. This trend, starting with the recognizable Silvercross fiberglass pram, has evolved to where even small details now signal the brand's desirability. This is one of the reasons why the aforementioned baby package also is a thing.

Fit inside the family car to follow on longer distance



Adding luxury



Convince with a multi adaptable system adjusted for the cities



1960

1980

2000

2020

Foldable frame and collapsible carrycot

Air wheels, ventilation, foam handle and more pockets

Convertible seat and turning wheels

Artificial leather

Textile

Coated Textile

Steel tubes

Alumium

Alumium and plastic parts

Rubber

Air wheels

Foam

Textile

Rubber

Leather

1965' The car is widely used



2006' Legal requirement that children sit in car seats



32 - Pram history

PRODUCT EXTENTION



33

1985'



34

2013'



35

2015'



36

2017'

Since the pram's implementation, small add-on products have been developed which in various ways have improved the pram's usage scenario. But since the sixties, new product categories have sprung from the prams, where they initially were products with a significantly different usage scenario than the pram (illu. 32 7-9 & 15-19), but in recent years the product categories have grown closer to the pram's original monopoly (illu. 33-36). It is seen how, Voksi, Najell, Filibaba and Moonboon, with the invention of

the sleeping bag, the soft lift, the nest and the motorized cradle, makes new product categories that gives an alternative place for the baby's nap. This means that the parents no longer dependent on the pram for naps during daytime, especially for the small child between 0-1 years. Although Najell's soft lift and Voksi's sleeping bag are most often used inside the pram, these products still provide more functions to the previously known pram add-on lift, which makes these products "must have" for parents if they use the pram daily.



Increased product focus between 0-1 years

COMBI - PRAM - STROLLER



PRAM

0 - 3+ years

Heavy

Takes up space

Lack of comfort sitting up right

COMBI

Pram 0 - 3+ years

Stroller 9 mth - 5 years

Heavy frame

Two expensive tops

Takes up space

COMBI

Stroller 9mth - 5 years

Pram 0 - 6 mth

Short carrycot

Two tops

Need additional nap "support" (6-9+ mth)

Lack of harness

STROLLER

9mth - 5 years

Not weather proof

Lack of comfort laying down

Finding the right pram, includes several important considerations for the parents to ensure choosing the right model for their needs and preferences (app. 1, 3, 5 & 7). This includes maneuverability, foldability and comfort for both the child and themselves.

The same applies when it comes to the stroller, which in most cases are easier to fold, and more compact, which makes it easier to handle on the go or when traveling.

"We often go on trips and have traveled a lot in the past - We want to travel more, which was an important part of the considerations when we chose a stroller."

- Christina

They also take into account the weight of the stroller, as a lightweight model can be more comfortable to handle, especially when carrying or lifting it in and out of the car.

"We also bought the stroller because it is easy to pack up and can just be thrown into the back of the car."

- NikoJal

Some prefer a stroller with three wheels and good maneuverability that can handle rough terrain, while others prefer a more lightweight model that is ideal for city use and shopping trips.



41 User interaction with a stroller



42 Picture from city walk

Likewise, the pram must suit their lifestyle and where they live. Parents who live in urban areas prefer a more compact and lightweight model that is easy to handle on public transport and narrow streets, while those who live in suburbs or rural areas seek a more robust and off-road pram for outdoor activities.

“We didn’t want swivel wheels, even though it’s good when you live in the city. It doesn’t work well for gravel, which their mainly is, back home at my family. we don’t know if we’re going to stay in the city, so we didn’t want to buy a pram for that.” – Anne

A combi pram is designed to be used from birth and until the child can sit up. The smaller size makes it a popular choice among parents living in the city. In Aalborg, nearly half of parents spotted on a typical weekday in spring were using combi prams (app. 8). Compared with the collected user data regarding pram model and addresses, it reflects a preference influenced by residential location (app. 9).

Combi prams are made with different useage scenarios in mind. Some models have a small frame, and functioning as a stroller turning into a pram, where other models have a larger frame functioning as a pram turning into a stroller (app. 10).

“If I could do it over, we would never have bought a pram to begin with – we should have gone with a stroller with a “laying insert”.”

– Rene

In terms of comfort, the mattress in a pram or combi pram is usually thicker and more padded, compared to the integrated mattress in the stroller that is thinner and more compact, suitable for sitting in (app. 11)

“No strollers are made to sleep in – the stroller is a plastic shell with a bit of wadding.”

– Fie Elvira Storm, Product manager Odder

In addition to functionality and comfort, parents also think about design and style. They often want a pram, stroller or combi pram that reflects their personal taste and fits their aesthetic preferences.

“Our pram was bought second-hand, but it had to be a traditional one with a specific look and model type” –

Anne

The price is also an important factor for many parents, as a pram is often a significant investment. They seek good value and longevity, ensuring the chosen pram meets their long-term needs.

“We chose the combi pram because it was cheap and small, so it was easy to take around here in the city, also on trains and buses”– Mathilde

Brand recognition and reviews from family or other parents is also a determining factor when making their final decision on purchasing a pram, stroller or combi pram.

“We have also asked many of those we know with children what they have been happy about”– Mathilde



Pram or combi pram: preference influenced by residential location

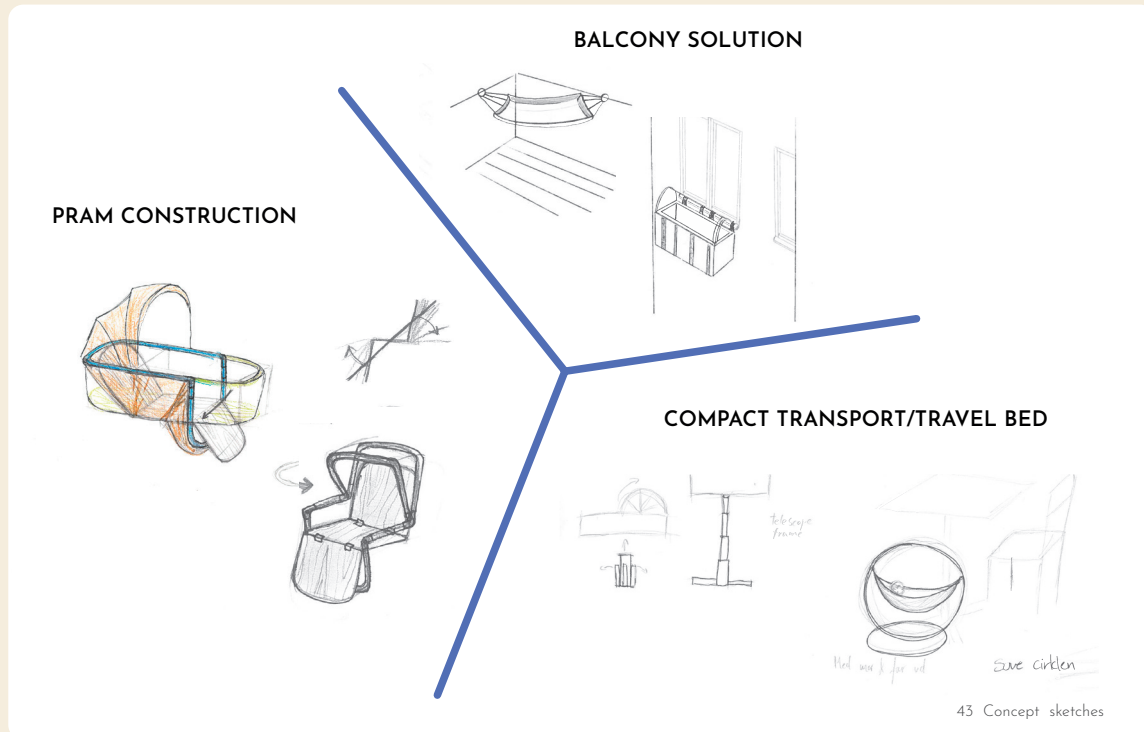
The stroller is not designed to provide comfortable naps on everyday basis.

It is not necessarily the child’s comfort that always has the highest priority.

FIRST SKETCHES

CHALLENGE THE PRAM

With the initial understanding of the context, a sketch round was carried out. This sketch round was focused on challenging the pram and its functions. The concept directions after this first roll are to change the construction of the pram's frame and carrycot, make the good balcony solution for naps and make the compact transport/travel bed for naps. The concepts can either be developed separately or together and implemented in the design of the next generation pram.



The initial sketching round emphasized that the possibilities for challenging the different usage scenarios of the classic pram were versatile. The sketch round also made it clear that it had to be verified that there was a market for more of a more specialized product compared to the pram as a generalist product. Therefore, work continues to target the problem areas in parallel with each other.

DESIGN BRIEF 2.0

The team has figured out how the pram is constructed and what trends and timeless aspects there are within the baby sleeping device category.

To confirm the observed trends the team, needs to gain knowledge about the current market of prams and combi-prams.



Very simple construction of the carrycot

Increased product focus between 0-1 years

Pram or combi pram: preference influenced by residential location

The stroller is not designed to provide comfortable naps on everyday basis.

It is not necessarily the child's comfort that always has the highest priority.

MARKET

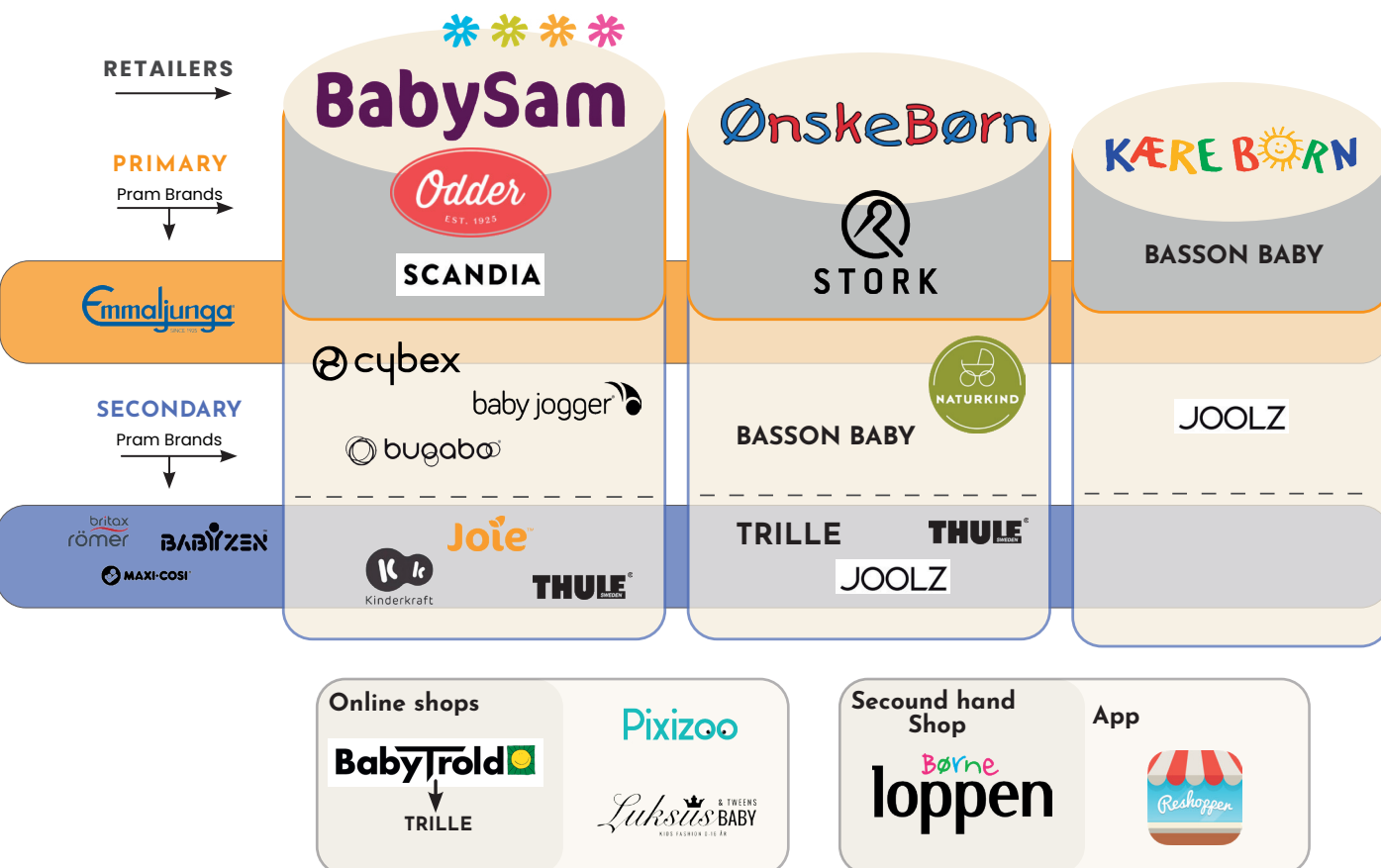
03 WHO ARE THE COMPETITORS & WHAT SELLS?

This phase delves into the market related to the product. It starts with an understanding of competitors and an interview with BabySam sales staff. This is followed by an examination of products used around the pram and exploring various potential sales channels providing insights for the product-market-fit (Haase & Laursen, 2023). The phase ends with introducing the case company, Odder Barnevognsfabrik paving the way for working with a product-company-fit (Haase & Laursen, 2023) and looking into the quality domain (Parasuraman et al., 1985).



A MATURE MARKET

SALES CHANNELS



44 Overview over sales channels

In Denmark, there are larger retail chains that specialize in the sale of prams and baby products. These retail chains are BabySam, ØnskeBørn and KæreBørn, which have physical stores all over the country as well as online where parents can buy prams and accessories. In addition to these retail chains, there are independent physical stores that specialize in the sale of baby products. Furthermore, online shopping has also gained increasing popularity, where parents can find a wide selection of baby products, prams and accessories. In relation to the last mentioned, Babytroll in particular is an important webshop, as they, as the only Danish online platform, have their own pram brand, Trille. Just like the two largest retail chains Babysam and ØnskeBørn own respectively Odder Barnevevstfabrik and Stork.

Recycling has always been a big part of the baby and children's industry, where products are inherited or sold on. If you

as a parent do not want to buy new, there are also increasingly second-hand shops and apps where used prams and baby products are sold. Among the largest are Børneloppen and Re-shopper, but also the classic, larger secondhand platforms such as Facebook Marketplace and DBA are major players in the baby world.

Although there has always been a high level of recycling in the baby and children's industry, it is not because the increasing "sustainability and recycling trend" has distorted the market yet. ***"Their 'share of voice' is probably much greater than their actual impact on the market as a whole"***, says Kenneth W. Nørgaard, CEO of BabySam in 2019 (Kongsholm, 2022).

COMPETITORS

In order to gain a better understanding pram market, a competitor analysis has been carried out on the most prominent brands. Based on this, the market has been divided into four general categories, each of which has its own characteristics and target groups

HIGH-TECH COMBI PRAMS

This segment includes Cybex, Babyjogger and Bugaboo. These brands focus on innovative and advanced features, lightweight materials, advanced suspension systems and modern design. They often cater to parents looking for a technologically advanced and stylish solution. In this category bugaboo trends with their sibling frame, which is adjustable from one to two seats. Babyjogger have made a three wheeled, easy manurable off-road pram and Cybex offers motorized hill assistance on their premium frame.

TRADITIONAL PRAMS

These brands are Odder, Stork and Emmaljunga. These brands have a traditional approach and often a long company history. They are known for their reliability, durability, high quality materials and classic designs. They appeal to parents who prefer traditional and reliable solutions that last for a long time. the latest initiative in this category is swivel front wheels and their biggest UPS is full length and premium materials.

BUDGET PRAMS

This segment includes Trille, Basson Baby and Scandia, which offer budget solutions for parents on a tight budget. These brands focus on basic features and an affordable price, often cater to parents looking for an economical alternative to the traditional prams. This category often has full length as well and are used as secondary pram solutions at day care or grandparents.

ENVIRONMENT AND ECOLOGY FRIENDLY PRAMS

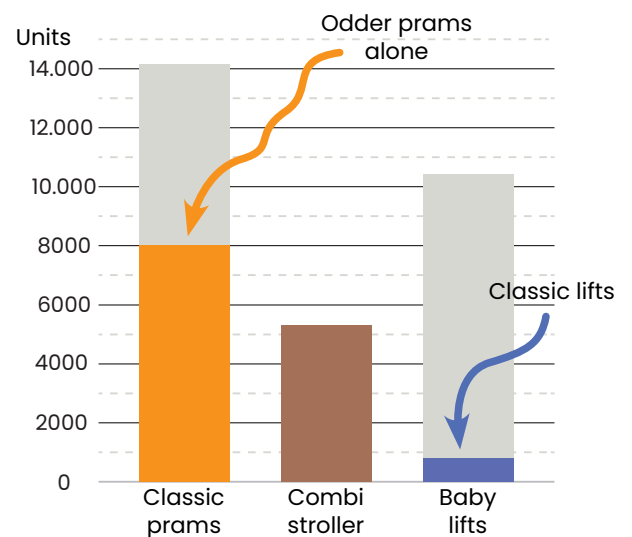
Naturkind focus on environmentally sustainable solutions for parents who want to minimize their environmental footprint. Here, materials, chemicals and production methods are used with care, the environmental choice weights higher that durability and long-time use. This brand appeal to parents who value sustainability and ecology very high.



45 Competitor overview

SALES TENDENCIES IN NUMBERS

Market data from the past year at BabySam (app. 12), one of the largest retailers in Denmark, clearly shows some significant tendencies in the sale of prams and accessories. Traditional prams still dominate the market with Odder as the clear leading manufacturer. Combi prams are also popular, especially from brands such as Bugaboo and Cybex. There is a clear preference for soft lifts over classic lifts, with Najell being a significant player in this segment. Overall, these trends indicate a clear shift towards more flexible and multifunctional products that can be adapted to different needs and lifestyles.



46 Sales tendencies

SALES EXPERTS

INTERVIEW WITH SALE SAFF

"The marketing of Odder are sparse and the brand doesn't create any attention to their prams with posters or signs in the visited store."



47 Pictures from retailer visit

To gain insight into the market for baby equipment and understanding the parents' preferences seen from sales staff point of view, a situated interview was conducted with a sales employee in BabySam. To substantiate this, another large baby equipment store, ØnskeBørn, was also visited and interviewed (app. 13).

FEATURES AND CHARACTERISTICS OF A PRAM

When it comes to customers' wishes and needs in relation to prams, several key features influence customers' decisions. One aspect is the terrain, considering whether the pram will primarily be used in the woods, on gravel or during shopping or walks on pavements. The swivel wheels are less suitable for off-road driving, where fixed wheels are more robust. In general, it is the size of the carrycot and functions of the frame that parents focus on first.

When it comes to different brands and models, there are different preferences and trends. Some prefer Danish brands such as Odder Barnevognsfabrik, while others favor Swedish brands such as Emmaljunga.

An ideal pram, based on the customers' wishes, would be spacious, around 97 cm long, Danish-made, and feature high-quality organic textiles. Parents value quality, robustness, adjustable ventilation, easily washable textiles, and several years of use for multiple children. For storage and maintenance, it's recommended to keep the pram indoors overnight and long-term to avoid moisture damage.

"I've had prams in for service where there were green stains when you lifted the mattress"

- ØnskeBørn employee

"We would not recommend that you store it in the attic, but instead fold it up and throw it under the bed"

ØnskeBørn employee

COMBI PRAM VS. TRADITIONAL PRAM

The choice between combi prams and traditional prams, is a consideration for many parents, and both categories have their advantages. Combi prams are increasingly popular in Denmark due to their compactness and maneuverability, making them easier to handle during transport, but it can be a challenge for parents to decide whether to buy both stroller and carrycot top together or separately, thinking about what to do when the child outgrows the carrycot after around six months.

On the other hand, traditional prams offer a full length, making them suitable for naps for several years. While combi prams provide practical benefits like a compact design, some parents prefer classic prams for their spaciousness and comfort.

"The advantage of the pram is the long lying position. And the advantage of the combi pram is that it is lighter and more compact"

- BabySam employee

ACCESSORIES FOR THE PRAM

There is definitely a wide range of accessories for the pram opting to improve functionality. One of the most sold additions in our shop, is the baby lift, where many customers now prefer the model from Najell. The soft lift offers several functions in addition to the classic lift, as it can be unfolded as a play rug or used as a baby nest indoor – ***"that is why I also often end up recommend it"***, Babysam employee. In addition, Najell offers a wide selection of colors, which appeals to many customers aesthetically.

"We recommend using a lift. Because, well, the thing with it is that the child will be much more swaddled here. When the child lies in the mother's womb for nine months, it is completely shrunk. So they must have more security than an older child must have" -BabySam employee

Other products that are often sold with the pram are mattress, rain cover, mosquito net, cup holder, diaper bag, service kit and maintenance kit. These accessory products address both needs for the baby and the parents.

There is a trend towards an increasing popularity of combi prams in Denmark, due to their compact design and maneuverability. Traditional pram continues to attract parents because of its full length, which gives the child more space and comfort. The most crucial functions of the pram are the size of the carrycot and the features of the frame. The most popular addition to the pram is the soft lift, it offers multiple use scenarios but mainly easy transportation by hand.



The recommendations regarding maintenance and storage do not match the users' behaviour.



The features of the frame is the main selling point other than the carrycot size.

The concept should combine the best features from both the pram and combi pram.

ADD ON PRODUCTS

PROTECTION AND COMFORT



EXTRA FUNCTIONALITY



CONVENIENCE FOR PARENTS



48 Pram add-on products

The purchase of a pram is a big decision for parents-to-be and is associated with a multitude of add-ons. As the sale employee mentioned there are several addition to the pram itself, parents consider to potentially improve the functionality and comfort for both the baby and themselves. These additional products allow parents to adapt the pram to their specific needs and preferences.

Illustration 48 shows how additional products can be divided into three categories: "Protection and comfort", "Extra functionality" and "Convenience for parents".

The category of Extra functionality is the prams biggest problem, as parents often buy these products to meet needs that the pram cannot meet on its own. This raises the question of whether the prams of the future should integrate several of these functions directly into their design in order to meet the needs of parents and minimize the need for external purchases. Looking at the other two categories, many of the products in the Protection and comfort for the baby category are already integrated in the pram or purchased as a complete package, while the products in the "Convenience for parents" category depend very much on the individual parent and cannot be seen as a general trend.

VISITING ODDER



"We think it's an exciting paradox that you buy baby products that you can only use for 3-5 years - but the products are made to be used for much longer" - Fie Elvira Storm, Product manager Odder



49 Pictures for Odder visit

In addition to the situated interviews with sale staff in retail stores an interview with the product manager of BabySam own pram brand Odder where contributed. It was carried out to gain a deeper insight into her experience of market, as well as knowledge about their products and understanding of the trends and challenges they face in the baby industry (app. 14).

HISTORY, VALUES AND QUALITY

Odder's values are rooted in classic Danish pram culture. We focus on propriety and quality, and our production follows strict standards and regulations. We are the nerds on the market. Our signature product, the deluxe pram, is a tribute to the Danish pram traditions and is designed for many years of use. With a large lying position of 97 cm, Odder prams offer a spacious and comfortable experience for the child.

Odder focuses on sustainability and recycling. In the fabrication we use weather-resistant textiles ensure that the pram remains in good condition over the years. Odder pram has a high resale value, which can be seen in our sales figures - but they have a philosophy that the same amount of materials are used, regardless of the pram are in good or bad quality, then they might as well do it properly.

MARKET AND COMPETITORS

There are regional big differences in which pram brands are the most sold. Cybex and Bugaboo combi- prams are best-selling can in the bigger cities like Copenhagen and Aarhus. Cybex has their market share through massive marketing and innovative combi models, while Bugaboo often seen with their Donkey frame, which can be expanded in width to accommodate siblings. Last mentioned are one of the most important developments in prams in recent times. Baby jogger is another brand that has made a name for itself with their three-wheeled strollers, which gives a whole new way of maneuvering. These new frames and brands have a certain influence on the market, but Odder still believes that

their own have an advantage due to the the Nordic environment and Denmark's unique pram traditions.

Seen from a professional point of view there are several considerations to take in the considerations choosing between a pram and a combi pram. A combi pram must have a maximum length of 80 cm due to the smaller size of the frame and Danish standards, this can be a disadvantage, as children often outgrow the carrycot quite early, even before the child are fully capable of sitting on its own. This is unhealthy for the child. There are also practical and financial considerations, as a combi pram can be handier to have around. Some brands like Emmaljunga have developed a larger pram that are sold to be combi pram, which work well in sales situations, but this can have a negative impact on the weight and maneuverability of the use as a stroller later. But the pram frame is the most expensive part of the pram to develop, so it make sense to get the most out of it, our Vida Pram from 2019 haven't break even yet.

ODDERS PRAMS AND THE COMBI PRAM

Odder Barnevognsfabrik offers three different models of prams that are aimed at different user groups based on their lifestyle and needs. The Vida model is designed with swivel wheels and is suitable for urban environments where solid surfaces dominate. The North and Saga model has fixed wheels and is suitable for off-road driving and long trips in the woods or on rough terrain, making it ideal for consumers who live in the countryside or need a more robust pram. Previously they had a combi-pram but do to a company - product mismatch is now taken off the market.



Regional differences in which brands are most popular

The biggest development in recent times is the combi prams

The product developer worries about child's comfort, due to limited sleeping space and the risk of premature transition to a stroller.

Throughout the preceding interview the team decided that Odder would make an honorable case company, for this project. Odder is the most expensive brand on the market and they thrive to give their customers the luxury through quality, it fits with the extended user fit the projects aim for.



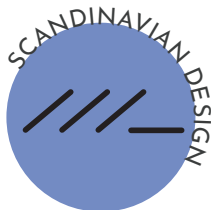
WHO IS ODDER?



Odder has a rich history that stretches back to their founding almost 100 years ago. Since 1925, Danish parents have transported and looked after their children in safe and comfortable prams from Odder. The company started by an ironmonger named Roland Petry. Despite a humble beginnings, demands quickly grew, and Odder Barnevognsfabrik became well known for their prams with focus on **safety, quality, comfort and design**. (BabySam, 2024b)



During Odder's long life, they have adapted the Danish tradition of babies napping outside, where they have therefore primarily focused on prams with long lying dimension. In recent years the company was bought by BabySam, but it is still run as its own small branch, where BabySam has been the sole dealer of Odder prams. BabySam's profile fits well with the **quality and expert expertise** that Odder wants to represent.



Over the years, Odder Barnevognsfabrik has grown considerably, and the company is now the only remaining pram factory in Denmark. With around 30 employees, Odder Barnevognsfabrik tries to unite tradition and innovation to create the perfect pram for the **Scandinavian climates and tradition**.



Odder achieves Scandinavian and traditional design through their focus on classic, elegant and simple designs that make them suitable for both urban and rural environments. This approach gives confidence in the product's quality and durability, as classic designs are often considered long-lasting and timeless. At the same time, Odder differentiates itself from the competition and builds a strong brand identity that is recognizable and valuable to consumers.



By focusing on quality and innovation within a narrow product area, resources and expertise are dedicated to perfecting every single pram model. This enables Odder to deliver high standard products that meet the specific needs of customers.



Looking at Odder pram catalog from 2017, it can be seen that one of the core values listed is functionality (Odder, 2016) instead of comfort, which is used today. This change in the core value could indicate that Odder Barnevognsfabrik has changed a little bit of focus as they are no longer frontrunners in innovation within prams on the Danish market. The switch to comfort therefore makes sense, as Odder still to this day sees itself as the pram brand that is **synonymous with the child's nap** outside the first few years of life.

DESIGN BRIEF 3.0

The pram market is a mature market with a wide selection of products, only a few targeting the Danish market in particular. The tendency of a growing add-on a product market interfering with primary use of the pram was confirmed. The pram is in tough competition with categories like the combi-pram and stroller and are almost always sold with extra add-ons. The team have selected the traditional Danish pram brand Odder as a case company.

To understand why the product category is expanded, users' needs and wishes would need to be further investigated.

X

The concept should combine the best features from both the pram and combi pram.

!

The recommendations regarding maintenance and storage do not match the users' behaviour.

The features of the frame is the main selling point other than the carrycot size.

Regional differences in which brands are most popular

The biggest development in recent times is the combi prams

The product developer worries about child's comfort, due to limited sleeping space and the risk of premature transition to a stroller.

PRODUCT-MARKET FIT

To ensure that the concept is relevant on the market, it is essential that the expression, functions, and price match the parents' expectations. This is attempted by working with the trends and functions seen on various products in an otherwise red ocean market (Kim & Mauborgne, 2004). If this is successful, the concept has the market advantage of extra features without an overall different appearance compared to the rest of the market.

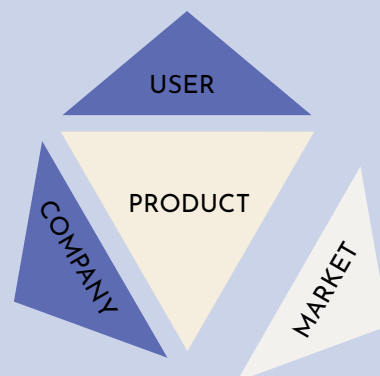
PRODUCT COMPANY FIT

To ensure that the concept has a strong identity, parallels are drawn to Odder already well-established brand. This not only increases customer awareness of the company and its brand, but also affects its competitive position in the market. Given the company's focus on classic design, comfort and safety.

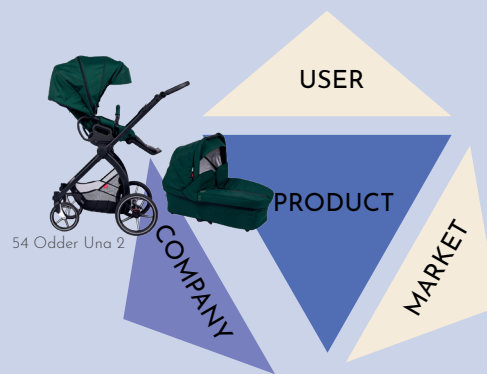
Odder has previously had versions of a combi pram called Una in their product range (Forbrugerrådet tænkt, 2021). Despite an understanding of innovation and diversification of their range, Una was unable to maintain the high quality and classic design that characterizes Odder (app. 15). This experience emphasizes the importance of working with product-company-fit that is consistent with the company's values, thus contributing to Odder's long-term credibility, reinforcing positive customer perceptions and maintaining a strong market position.

QUALITY GAP

Odder is a relevant company to look into, as they have a need to stay relevant to avoid quality gaps (Parasuraman et al., 1985). Although Odder has been the market leader in the pram category and makes classic products, consumers always have high expectations for the product they buy. These expectations do not always match the consumer's perception of the product when it is purchased and put into use. Therefore, it is important for Odder to constantly adapt and innovate to ensure that their products live up to the high standards that parents expect.

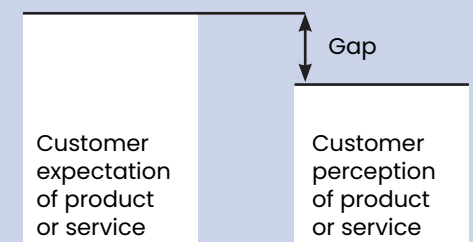


52 Product-market mismatches (Haase & Laursen, 2023)



54 Odder Una 2

53 Product-company mismatches (Haase & Laursen, 2023)



55 Quality domain (Parasuraman et al., 1985)

USERS

04 LIFE CHANGING EVENT

This phase delves into the life changing event it is to become parents. Beginning with exploring the aspirations and worries of parents followed by mapping of activities the first year, in a week and day. The parents provide insights from their experiences working on different levels of knowledge (Sanders, 1999). An interview with a health nurse provides valuable insights into children's development and sleep patterns, which lays the foundation for generating more specified concepts ideas working at the spiritual and principal level (Lerdahl, 2001). Furthermore, an examination of sleeping products is conducted, evaluating their features and benefits for consumers. Lastly triangulating (Tollestrup, 2004) is used to get an internal common understanding.



HOW TO BE PARENTS?!

ASPIRATIONS & WORRIES

Through a series of interviews (app. 1, 3, 4 & 5) with first-time parents, invaluable perspectives on the transition from “before children” to parenthood were gained. By utilizing methodology within design ethnography and user research a few top-of-mind aspiration and worries were discovered (illu. 56). By semistructured interview physically and over the phone following topic stood out as the most important.



56 Worries & Aspirations

SPONTANEITY

“The spontaneity is gone, and you can’t go out and travel” – Nikolaj

This indicates a marked change in their daily routines and opportunities for spontaneity while expressing a desire to still be able to go on small trips and experience the world. It is a challenge for many parents to balance the role of parent with maintaining their own identity and well-being. Many strive to be a just a good parent, while also wanting to maintain their individual interests and needs, but there ***“is always focus on the children first and their needs until they become more and more self-reliant”*** – Karen

“alone/cozy time in the evening is often forgotten because you are tired and go to bed at the same time as the baby” – Anne. This reflects the challenge many parents face in finding time for themselves and the relationship after the children are born. Another parent shares ***“it’s permanent – I can’t escape being a father”*** – Nikolaj, showing insight into the seriousness and responsibility of the new role one has taken on as parents, but also the fear of it and not being enough.

When it comes to maintaining healthy relationships with friends, ***“it matters a lot when they are invited out compared to whether it fits with her nap”*** – Ditte. This shows how parents need to plan and adapt their activities to the children’s needs, but it also emphasizes the importance of continuing to see friends and family.

HOBBIES AND ALONE TIME

“with both one and two kids, it is primarily our hobbies that are compromised” – Linda

This shows the challenge of finding time for personal interests and how priorities change, adapting their activities to the children’s needs.

HEALTHY ROUTINES

Furthermore, good health for the child is a top priority for every parent. This involves ensuring that the child receives the right nutrition, exercise, and care in order to thrive and develop. Being aware of the child’s health and well-being is a central part of the parenting role, and for many parents, this also means that a lot of different products need to be acquired.

As new parents, navigating the countless baby products can be overwhelming, often feeling like ***“a jungle to find out what is the right purchase for us”*** – Matias, captures the sentiment of many parents faced with the task of selecting the best products for their newborn. In such situations, it’s not uncommon for parents to opt for the ***“most expensive one to be on the safe side”*** – Matias. However, this approach can lead to unnecessary expenses and may not always guarantee the best fit for their needs.

Together these quotes and examples show that the transition from couple to life as parents involves major changes in routines, priorities, and responsibilities. The parents must adapt to a new reality, where the children’s needs often come first, and where time for themselves and the relationship are downgraded. The insights are shedding light on the diverse array of emotions, concerns, and aspirations that define the transition to parenthood.

THE DIAPER BAG

A diaper bag is an indispensable companion for any parent when they leave home, it ensures that they are prepared for any situation. Back home they have planned and reviewed all worst-case scenarios in their head, in order to predicted what may be need later on when leaving the home.

“if the kid don’t have fun, we don’t have fun”

– Nikolaj

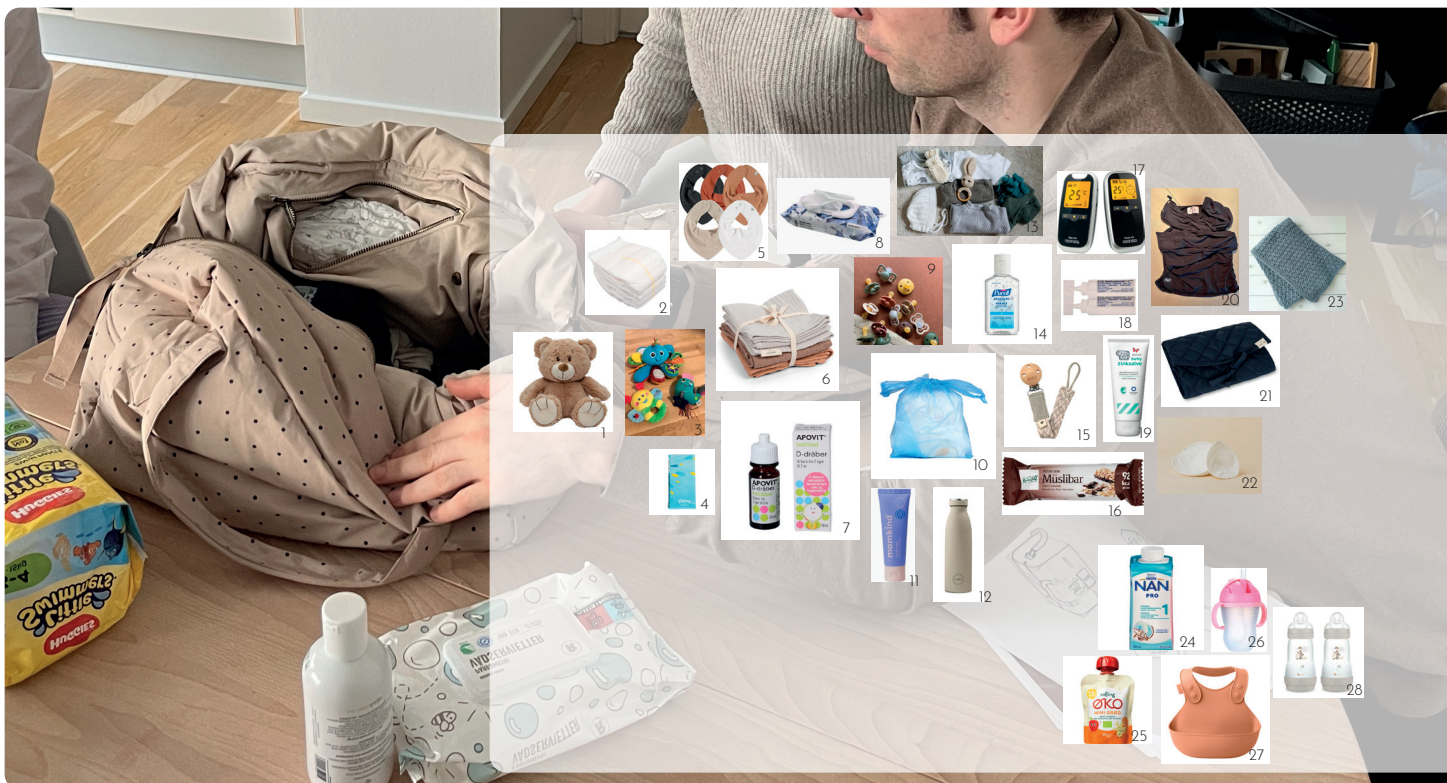
The contents of the diaper bag can vary depending on the child’s age, the trip and individual baby’s needs, but there are some essential products that most parents always bring (Illu. 57). This includes diapers, wet wipes, changing clothes, trash bags, baby monitor, changing pad and possibly a bottle of breast milk substitute or breastfeeding equipment. In

addition to the basic supplies, the parents also bring snacks, different types of lotion, toys and a pacifier to comfort the baby. The snacks is both for the mom and the baby, when the baby is breastfeeding it takes a lot on the mother’s strength and water and food are, according to several users, necessary to maintain surplus overview.

At the same time, the diaper bag is not only to the child and the mom on small trips ***“it can also be used as a weekend bag, you can pack mother and baby in it for a whole weekend”*** – Anne.

Having these supplies close at hand, gives parents the reassurance and confidence to handle any unexpected situation, no matter where they are and give the possibility to leave their home quit fast, since the diaper bag is always half packed and ready to go.

PACKING FOR WORST CASE SENARIO



57 User diaper bag



The diaper bag has become an expert tool to the parent, resulting in the feeling of freedom and being well repaired.

DAILY ROUTINE

Before the map for the user scenario (cf. 13) where made the frequency of naps in different ages where investigated and analyzed in order to determined what are important for the baby and the parent during different development stages. Based on user interview (app. 7, 16 & 17) and the book "Tryg søvn" by Sine Ditlev Bihlet (Bihlet, 2022), a generalized day are mapped 0-2 mth, 3,6 mth and 18 to 48 mth. A closer look on the day's content and which products are used focusing on snuggling and naps are made, to determined when the pram is used as first choice.



THE FIRST MONTHS WITH A BABY

A new-born baby needs 15-18 hours of sleep on average a day. For new parents, the first months are all about getting to know their baby and its way of behaving. Babies sleep most of the time, and it is very unpredictable when and for how long they will sleep, moreover the rhythm varies from day to day (Bihlet, 2022, p. 33).

The infant's sleep is largely controlled by the child's need for food, not affected by light or dark, night or day. When a child is 0-4 weeks old, it sleeps in short stretches of sleep of 1-4 hours, and it is like that all around the clock. Parents are therefore recommended to be prepared to be very flexible.

The most used product is the nest which is easy to adjust to the different situations around the home.

"In the first period he slept EVERYWHERE - you don't really put an infant to sleep, as they don't sleep for more than 1-1.5 hours at a time, so he just stayed where he had fallen asleep" - Anne

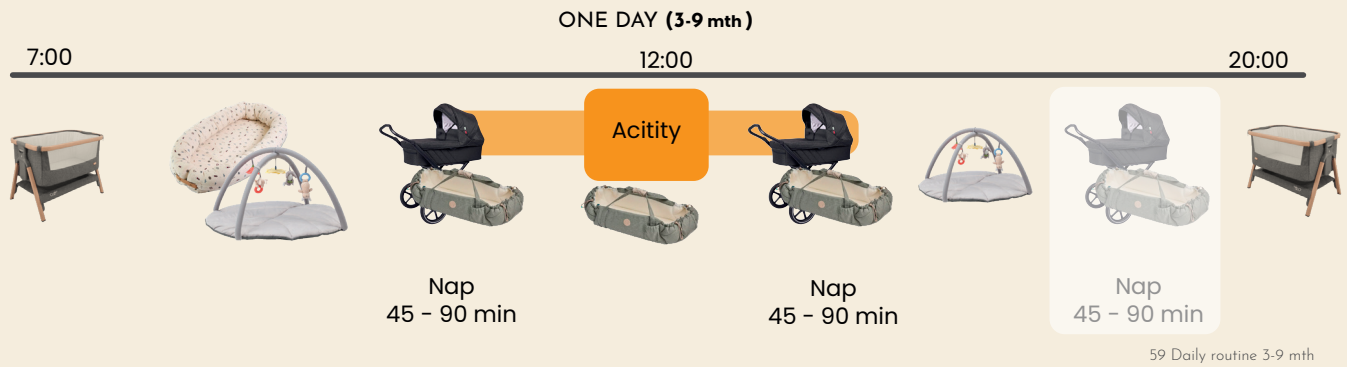
REFLECT ON ACTION

"This map has been changed several times, because it took a long time before the team understood that the products used, most of all are controlled by where the parents is located. The baby sleeps everywhere without any fixed routine or requirements for in what or where. There is not much insight to be gained by only looking at the sleeping product without physical context"

EVERYDAY BEGIN

Around 3 months of age, the child begins to need 3-4 naps daily more firmly, with 1,5-3 hours of awake time in between. The infant develops enormously, and the world opens and gets bigger around the child. They absorb new impressions and can therefore find it more difficult to shut

down stimuli and find peace for sleep. Children of this age need help to sleep, for example through a close hug, teddy bear, song, or white noise. The child sleeps 14-15 hours during the day (Bihlet, 2022, p. 35).



EVERYDAY CONTINUES (6- 12 months)

The everyday from 6-12 months, have the same sleep needs, however the baby changes forwards more awake time during the day and longer continuous sleep at night. It does not change the previously mentioned number of naps, however during this period there is a transition from three to two naps when approaching one year of age (Bihlet, 2022, p. 36).

As the world opens around the child, it makes sense for the child to go outside the four walls of the home, furthermore the routine that occurs quietly gives the parents the opportunity to plan trips outside the home for the baby, and self-care reasons.

"You get completely "crazy" just sitting at home. It is also good stimulation for both children and adults."

-Survey answer 10

"It is as if it resets the whole family, and it gives a better mood, to get out and get new inputs and experiences."














- Survey answer 16

"Mentally and physically, it is important to me as the rest of the day is often indoors without much movement" - Survey answer 3

The weekly schedule above is an example of activities during a week for one of the users (app. 7). Subsequently, it was reviewed with knowledge from other user data in relation to which activities/events a family might encounter during the first year with a baby. This is done to collect information about which special conditions a sleeping solution must be adapted to meet the users' needs, (Illu. 60).

ACTIVITIES DURING A WEEK WITH A 6 MTH BABY

MONDAY	THESDAY	WEDNESDAY	THURSDAY	FRIDAY
Leave home in before noon	Leave home in the morning	At home all day	Leave home in the morning	At home all day
Baby nap on the go	Nap on the way and outside one the house of one of the members in the maternity group	Nap on the balcony	Trip with the train when the baby naps	Nap on the balcony
Visit paediatrician	Visit in the maternity group	Walk and nap in the afternoon	Pick up parcels	Walk and nap in the afternoon
Returing back home	Nap on the way home and sleep in the yard		Trip to the shopping center	Family cozy time in the evening
Nap on the balcony			Nap while walking home	

	ACTIVITIE	DURATION	FREQUENCY	SPECIAL	HURDLES
	Resturant	1,5 - 3h	Monthly	Crowed space	Not knowing the layout
	Grocery Shopping	0.15 - 1h	Daily	Timeschedule	
	Shopping	1,5 - 3h	Weekly	Noise	
	Visit Friend (appartement)	1,5 - 4h	Weekly	Stairs/elevator	Hard to bring the pram
	Birthday	3 - 5h	Monthly	Many people	
	Forrest trip	1 - 2h	Monthly	Terrain	
	Attraction	3 - 4h	Monthly	Payed entrance	
	Traning with babys	3 - 4h	Weekly	Requires focus away from kid	
	Maternity group	4 - 5h	Weekly	Many babies	
	Daycare - back & forth	0.15 - 0.5h	Daily	Thigh timeschedule	
	Doctor appointment	0.5 - 1h	Monthly	Meet on time	} No need for pram, carrying the child
	Baby swimming	1.5 - 2h	Weekly	Dressign	
	Baby activity (hymn, motor skill)	1.5 - 2h	Weekly	Meet on time	

60 Activities on the go

LIFES GOES ON - TIME FOR MEMORIES

ONE DAY (24-48 mth)

6:30

11:00

19:00



Wakes up after
12 hours of sleep



Nap
Approximately 2 hours



Back to
sleep

61 Daily routine 18-48 mth

Around the age of 18 months, most children start to be able to settle for one nap of between 1-3 hours during the day. The child needs 12-14 hours of sleep and can sleep 9-12 hours at night (Bihlet, 2022, p. 40).

Between the ages of 2,5 and 4, the need for midday naps disappears for most children. They sleep around 10-13 hours in a day, of which 0-2 hours are during the day (Bihlet, 2022, p. 44).

Thereby leaving the time from 3-12 mth as the most interesting time seen from a snuggling and nap point of view. Here, the pram is a tool in everyday life, where the stay-at-home parents on maternity leave must get the child to sleep in several situations outside the home, where the pram may not always be able to come along today.



Focussing on the babys need from 0-12 mth

SLEEP “EXPERT”

INTERVIEW WITH A HEALTH NURSE

This interview with a health nurse was conducted with a semi structured approach to gain an understanding of babies’ needs and development, parents’ challenges and her experiences with parents navigating the vast market of baby products. The health nurse has been an invaluable source of expert knowledge about infant well-being, nutrition, sleep, and general development of a baby, but is wants to be kept anonymous in this report (app. 2).

Although this interview chronologically were conducted late in the project, it goes well in hand with the pervious mapping and is on that behave placed here to verify previously data.

“No need to be confused or in doubt about baby sleep facts as long time as we have been.”

RECOMMENDATIONS AND CONSIDERATIONS

One of the most important elements in creating a safe and secure sleeping environment for infants is a firm, flat surface and ensuring that the baby is lying on its back, to reduce the risk of cot death. During the day, it is important to allow the child to be exposed to light and air, as this can help regulate melatonin levels and promote healthy sleep.

As a health nurse, one of the most important tasks is to guide and support parents in making well-considered decisions about their baby’s well-being. At the first meeting with the parents, the emphasis is getting them to consider what is necessary for their baby. They are encouraged to think about whether they can borrow, buy used or do without some of the many products they feel the need for. Security and presence are utmost important to the child, just be around and attentive. The health nurse recommends parents focus on routine and rhythm when the child is around two months to help the child self-regulate to sleep.

“We ask parents to think twice about what they need”

Parents can feel stressed and overwhelmed, especially when it comes to getting their child to sleep. Stress is contagious

and the child will respond to the parent’s emotional state. It is important to create a calm and relaxed atmosphere around naptime to help the child fall asleep.

“Stressed parents have a hard time getting a child to sleep – the feeling of stress is incredibly contagious, and the child will feel it and be alert and therefore not want to sleep.”

MOTIVATION FOR PARENTS’ PRODUCT CHOICE

For many parents, baby equipment is an integral part of preparing for the baby’s arrival. There is a widespread feeling that anything labeled “baby” is necessary for being a good parent. This pressure can be amplified by social media and the constant flow of information from friends and family. It is not unusual for parents to feel insufficient if they don’t have all the latest products and gadgets for their child. This tendency to buy products before the arrival of the baby is a relatively new phenomenon and can lead to unnecessary consumption and financial stress.

“Anything that says baby on it is a gold mine – The parents express that if they do not have it, they are afraid of appearing as bad parents”

The classic lifts are almost no longer seen in user context, while the soft lift in particular has gained ground with its multi purpose. A combi pram can be handy in urban environments or for those with limited space, and switching to a stroller early, which the combi pram cause, isn’t necessarily a problem as long as it’s safe and the baby sleeps well.

“I think combi prams are practical in the city or for someone who has a small car – but I don’t see much around the suburb where I drive around... It is generally not a problem to get into the stroller early, if it is safe and the child sleeps well”

The interview confirms previous data with expert’s word for it and highlights the importance of carefully considering the necessity of baby equipment to avoid unnecessary consumption and other stress factors. A safe and calm sleeping area and routines to help the child regulate its sleep.

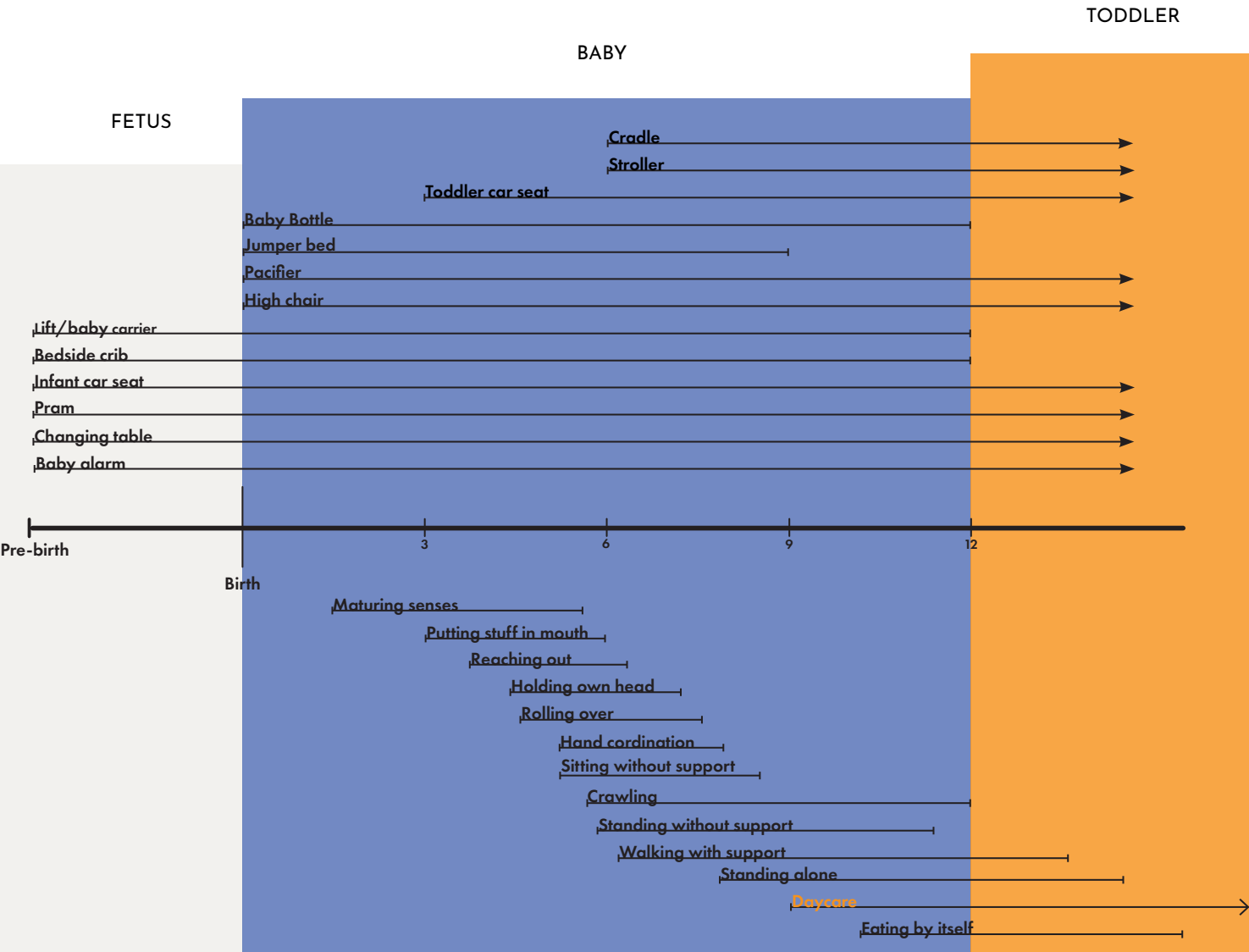


Avoid unnecessary baby equipment, to potentially reduce stress factors.



CHILD DEVELOPMENT

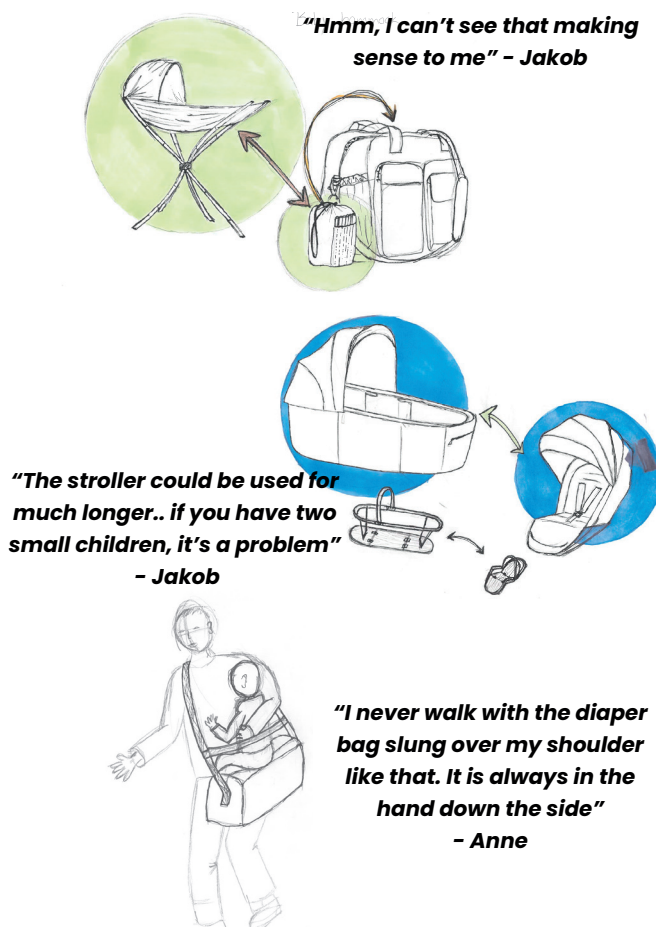
In continuation of the previous maps and interview, the motor milestones in a child’s development between 0-1 years are mapped out (Lindhardt, 2023), together with an overview and which products the parents buy and when. Full charts se appendix 18.



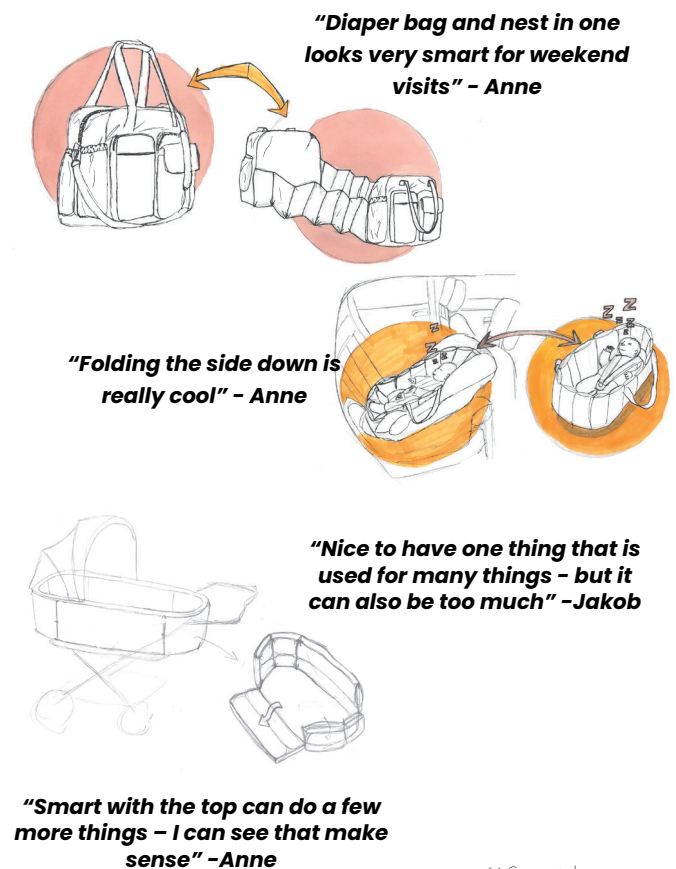
CONCEPT DEVELOPING

From the insights gathered the next generation of the pram was conceptualized. With two different approaches the future possibilities were explored and evaluated. The two overall strategies was to rethink the pram functions in new ways and on the other hand combine multiple baby products into one unified design, acting as an expert tool like the diaper bag.

THINKING NEW



COMBINING PRODUCTS



64 Concept drawings

When presented to users (app. 19), the concepts were met with mixed feedback, where some concepts were met with interest, where others shot down on their basic principle. If the user feedback is compared with previous research and conclusions, it is also possible to sort out several of the concept on the basis that the usage scenario is too specific and therefore has too small an impact in a busy parent's everyday life.

In order to focus chose a single conceptual direction, the group wanted more knowledge about the products observed in the parents home and mapped out earlier. It was yet to be what influence these products have on the family's daily life and routines.

SLEEPING PRODUCTS AND THEIR USE

Based on earlier user research, an overview is made. This showcases when which “sleep products” are used and what advantages and disadvantages they each have, in order to get an understanding of how

the future pram can fit in or stand out from these. Some products are only socially accepted at home and are not brought when visiting others people’s homes, some are only used outdoor and some in the transition.

	WHAT	WHERE	WHEN
	A crib with free access to the baby from the parents’ bed. The baby can be reached, seen, and heard without unpurposed interaction in while parents are asleep.	Bedroom, right beside parents’ bed	Nighttime 0-6 mth Every night 8-12h
	A small, portable baby bed for supervised naps or rest. Can be placed almost everywhere in the house such as beds, sofa or dining table.	Around the house	Daytime & nighttime Sleeping: 0-2 mth Use: 0-6 mth Every day Approx. 1h at a time
	A swaddling duvet of a child, used for outdoor napping and transport depending on the model. Depending on the model: Bottom plate and handles to transfer the baby from pram to indoors and vice versa. This removes the comfort of the pram madress.	In the pram or stroller	Daytime 0-18 mth Every day 2-3h at a time
	Can be put in the pram, lifted and carried around when going inside.	In the pram Around the house	Daytime 0-6 mth Every day 2-3h at a time
	Can be put in the pram, lifted and carried around when going inside.	In the pram Travel bed	Daytime 0-6 mth Every day 2-3h at a time
	A carriage for transporting babies, primarily used for naps outside and walks.	Outside the home Transportation from A to B	Daytime 0-36 mth Every day 2-3h at a time
	Baby hammock that bounces up and down to calm the baby.	At home	Daytime 0-8 mth Every day 1,5-3h at a time
	To carry the baby skin against skin and give the patens free hands.	Outside and at home	Daytime 0-7 mth Couple time a week 1-2 h at a time

PROS	CONS	REQUIREMENTS
<ul style="list-style-type: none"> • Close to parent and safe • Mom have the ability to stay in bed when breast feeding. 	<ul style="list-style-type: none"> • Often looking like medical equipment. • Add on to the bed that take up space 	<ul style="list-style-type: none"> • High and stable frame • Ergonomic for the child – giving the baby free movement
<ul style="list-style-type: none"> • Often adjustable can provides a snug sleeping space. • Prevents baby from rolling and falling when laying other places than the floor. • Allows parents to keep baby close during activities. • Can be used inside side crib when the baby is infant. 	<ul style="list-style-type: none"> • Not approved for unattended sleeping • Short lifetime 	<ul style="list-style-type: none"> • Cosy look and feel • Aesthetics fits on the couch, in the crib, on table as a pillow or blanket.
<ul style="list-style-type: none"> • Warm and insulating • Ideal for outdoor naps in cold, Nordic weather. • Can be unfolded and used as a play mat. • Different swaddle settings depending on the weather and child size. 	<ul style="list-style-type: none"> • Too warm in the summer • Many steps to fold correctly. 	<ul style="list-style-type: none"> • Isolation all around the baby without the baby having any possibility to "escape"
<ul style="list-style-type: none"> • Transfer the baby from pram to indoors and vice versa. • Creates a snug sleeping area in the pram. • Lightweight and compact • Can be used as a nest indoor • Can be unfolded to use as a play mat. 	<ul style="list-style-type: none"> • Can be heavy to carry in one hand as attended. • Not secure regarding the Babylift standers • Handles hanging loose. • Only contains a thin mattress 	<ul style="list-style-type: none"> • Soft foam edges gives structure • Handles for one hand carry and crossbody • Cosy appearance
<ul style="list-style-type: none"> • Transfer the baby from pram to indoors and vice versa. • Creates a smaller sleeping area in the pram • Doubles as a travel bed for shorter trips. • Safe for unattended sleep. • Ergonomic mattress for comfort. 	<ul style="list-style-type: none"> • Rigid and heavy to walk with 	<ul style="list-style-type: none"> • Rigidity and safe sleep area • Integrated canopy • Matching aesthetics to the pram
<ul style="list-style-type: none"> • Provides weather protection. • Enables longer-distance movement of the baby. • Offers storage for other baby and everyday equipment. • Provides a safe and cosy place to sleep for the child. 	<ul style="list-style-type: none"> • Big regarding manoeuvring. • Unhandy in small places and folded e.g. in the car. 	<ul style="list-style-type: none"> • Easy transportation when walking • Weather protection • Canopy for shielding • Elevates baby from the ground when sleeping outside • Possibility to use for several years.
<ul style="list-style-type: none"> • Automatically rocks the baby up and down. • Provides parents with more time with both hands free. 	<ul style="list-style-type: none"> • Not approved for unattended sleeping. • Not naturally reacting no babies motion. • Keep the baby locked. 	<ul style="list-style-type: none"> • Mimics the bouncing feeling that the baby knows from the mother's tummy. • Motorized
<ul style="list-style-type: none"> • Swaddles the baby. • Give the carriers free hands while bouncing. • Allows the baby to sit in various positions. 	<ul style="list-style-type: none"> • Physically hard to carry – Can cause pain in the carriers back and shoulders • Can only be used with a short time, when the baby is small and light. • Have to learn how to tie it correctly. • Can be seen as a women product 	<ul style="list-style-type: none"> • Gives comfort to baby • Ergonomically correct for the child and the carrier



DESIGN BRIEF 4.0

Through in-depth user research, the team was able to concretize the wishes, worries and needs that new parents often face. Through this it was possible to map the daily routine and the use of the many new products targeted at the age group of 0-1-year-olds. The user data is held up against previous insights from market research and inputs from a health nurse.

With a basic knowledge of the market, the user group and the relevant product categories, the insights must be transformed into a sharper concept direction.



The diaper bag has become an expert tool to the parent, resulting in the feeling of freedom and being well repaired.

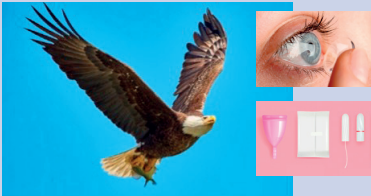
Avoid unnecessary baby equipment, to potentially reduce stress factors.

Rigid for outdoor use, cozy for indoor comfort



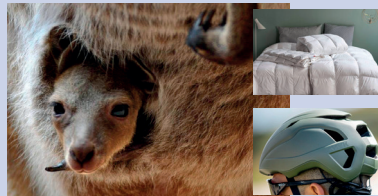
Focussing on the babys need from 0-12 mth

To get a common understanding internally in the team, selected key words of parents' aspirations is described using the triangulation method (Tollestrup, 2004).



Freedom

"Like sitting behind the steering wheel of a car "



Security

" Like the yolk in an egg"



Comfort

"Like floating"

66 Triangulation

Summarizing the characteristic of the parents' and evaluate potential USP for product that meets the parents' needs and wishes.

TARGET GRUOP

- Family: First-time parents with infant 0-1 years old
- Personality: Independent, spontaneous, passionate about career prospects
- Lifestyle: Enjoys hobbies, loves traveling and prioritizes physical health
- Values: Sustainability, family and friends time
- Challenges: Feeling insecure about parenting role, struggling with pressure, monotonous routines, and loss of identity
- Desires: Maintain active lifestyle, find balance between parenthood and personal interests, prioritize sustainability, save money where possible

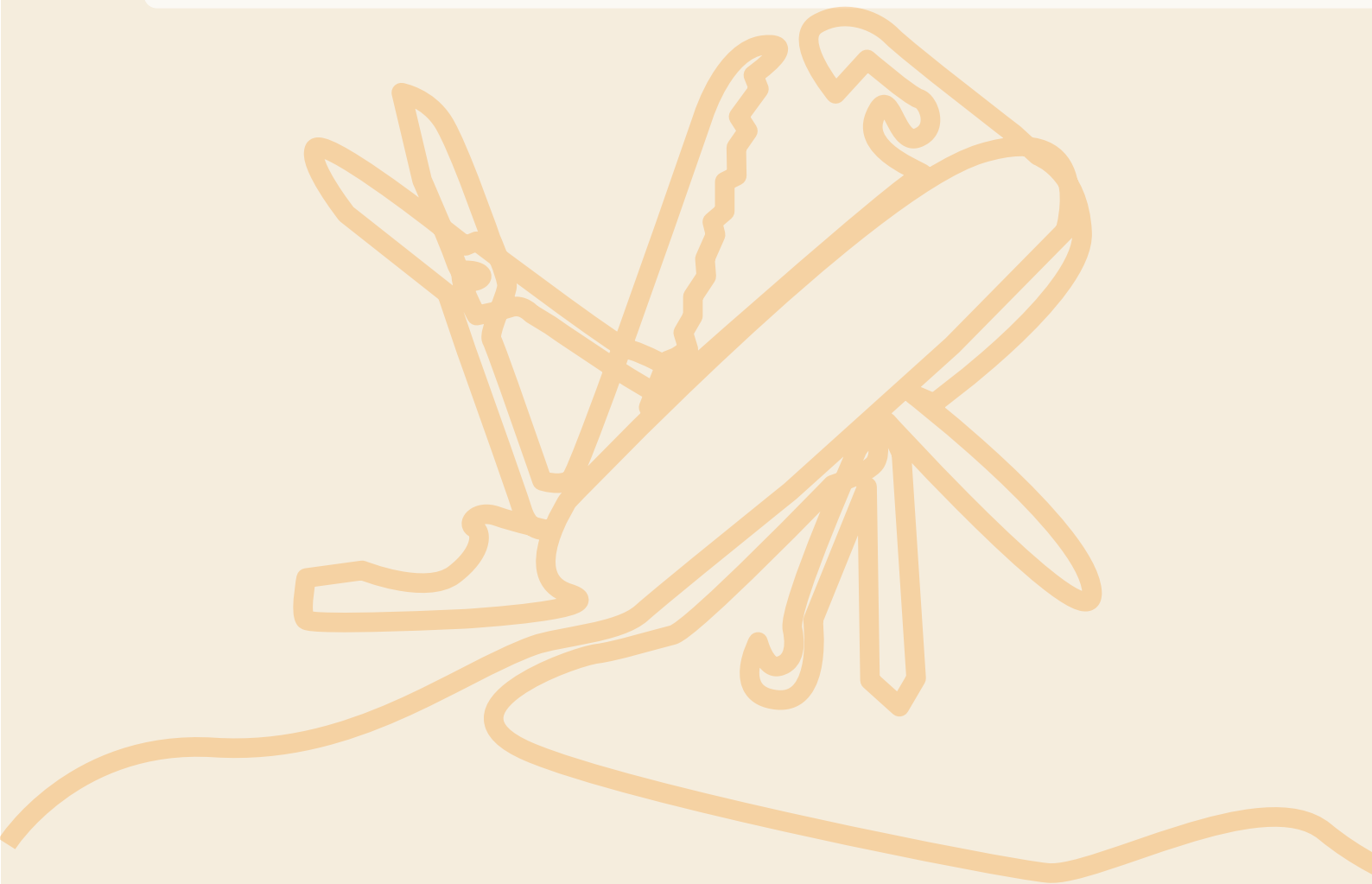
UNIQUE SELLING POINTS

- All in one expert toll
- Fewer things to pack
- Removes the fear of lack of preparation
- Socially acceptable to bring to different places
- Stand alone product (no need for add on products)

MULTIFUNCTIONAL

05 ALL IN ONE EXPERT TOOL

This phase picks up the concept development process with sketches and mock-ups. A foldable concept is developed and presented, showcasing the initial vision for the product delving into the principal level of the value pyramid (Lerdahl, 2001). This is followed by a reframing of the key problem – the transition between indoor and outdoor looking back at the contextual level of the solution space (Lerdahl, 2001). Analysis of indoor and outdoor products is conducted before limiting the project scope and updating the target group.



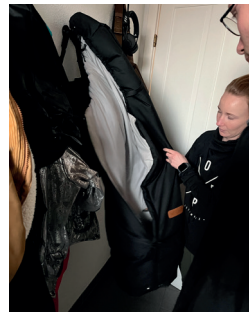
CONCEPT DEVELOPMENT

NEW CONCEPT DIRECTION - MERGE TO AN EXPERT TOOL

Back focusing on concept development and what key insights are gathered from market and user research and analysis.

Something repeatedly mentioned by the parents is that there are an excessive amount of baby products to choose from, which can be overwhelming (app. 17) and at the same time, they have expressed positive feedback towards previous sketch ideas that consisted of merging different baby products (app. 19). Additionally, one of Odders key values is narrow assortment, which together creates a potential for creating an integrated solutions that combine several functions in one device, simplifying the parents' selection process by an "Expert tool approach" like with the diaper bag.

The existing baby products for sleep can be clustered into four general categories that address different needs of both babies and parents. Almost every user visited had one or more product in each category (app. 1, 3 & 4).



67 User pictures

SLEEPING AT NIGHT



TRANSPORT



SNUGGLING



FREE HANDS



"How many products do a baby need to sleep? Twelve in the first couple of months?!"

68 Product overview

If a future sleep product can provide the parents with an expert feeling, it will meet the aspiration of less planning, time for hobbies and relaxation which the parents strive for. At the same time, it could improve the baby's sleep though fewer expressions, napping in the same product always (Bihlet, 2022).

DESIGN PARAMETERS

1. SIMPLIFY PARENTS' PURCHASES: ADAPT FUNCTIONS TO SUIT VARIOUS SLEEPING SCENARIOS:

Outdoor stationary use
On-the-go- outdoor naps
Overnight trips
Indoor use at home
Beside the bed

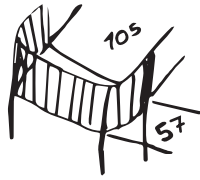
3. RIGID FOR OUTDOOR USE, COZY FOR INDOOR COMFORT.

4. OPTIMIZE SIZE FOR 0-3 YEAR-OLDS:

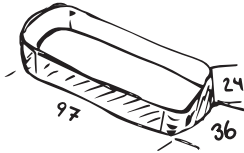
0-1 years Frame/bottom dimensions: 70x30 cm

1-3 years Frame/bottom dimensions: 98x30 cm

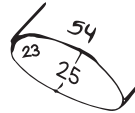
2. ENSURE COMFORT FOR BABY AND MINIMIZE EXTERNAL STIMULI



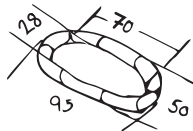
SIDE CRIB (0-8 MTH)
- High sides
- Hard frame



CARRYCOT (0 - 36 MTH)
- High sides
- Outdoor fabric
- Hard frame
- One time fold



BABY CARRIER (0 - 7 MTH)
- Medium/ high sides
- Fold complectimes a day



BABY NEST (0 - 5 MTH)
- Low & wide sides
- Soft & cosy frame

69 Size overview

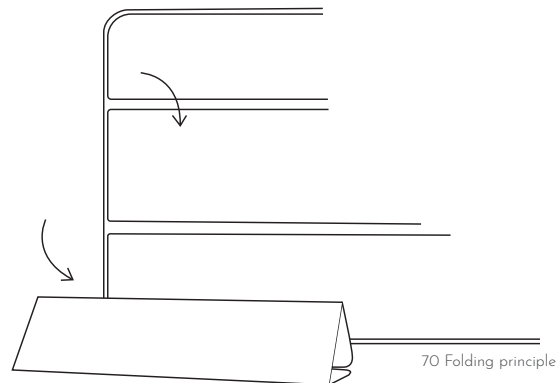
SIZE ANALYSIS

Based on one product in each of the four categories "sleeping at night - transport - snuggling - free hands", an analysis is made of the dimensions of the side crib, traditional carrycot, soft lift and baby nest. From this, it can be established that there are standard, legally bounded, measurements for the height of the side crib and the carrycot (Dansk standard, 2022). There are also average values for the heights of the nest and soft lift, which there is no legislation on. The soft lift is designed to fit in a carrycot and thereby it gets its measurements. The nest gets its height based on the demand that the parent need to be able to see the child, not leaving it unattended when it is in the nest (Voksi, 2024).

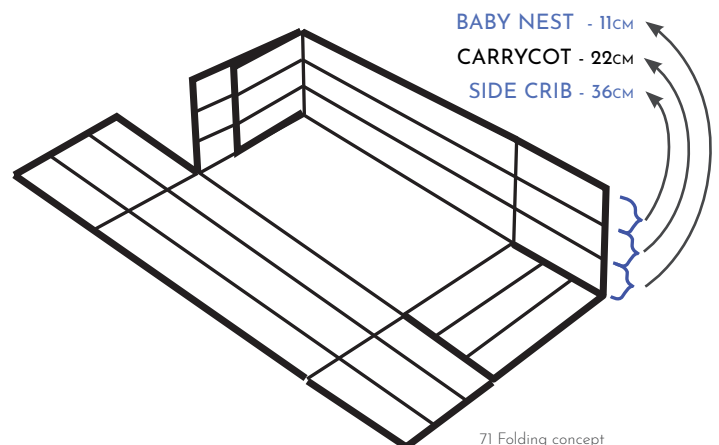
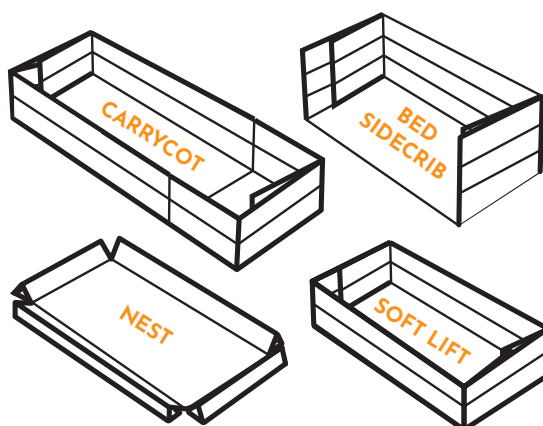
FIRST REAL CONCEPT

FOLDING PRINCIPLES

Based on the previous size analysis, this project's first actual concept is developed (illu. 71). The central element of this concept is folding (illu. 70). Three fold lines on each side, give the user the flexibility to vary the height from nest to crib. By opening up the sides either partially or completely the concept includes the four mentioned products from the size analysis and also creates a play rug. The three fold guidelines are made based on the requirements from the size analysis (illu. 69). Furthermore, considerations have been made on where expansion plates can be placed to enable the carrycot to extend to the full length (app. 20). This innovative concept offers practical solutions for parents looking for versatile sleep products for their infants.



70 Folding principle



71 Folding concept

1 : 1 INTERACTION MODEL AND TEST

FOLDING PRINCIPLES MOCK-UP ITERATIONS

The first iterations of the folding expert tool concept were made in paper models but a 1:1 mock-up where needed to test the usability for the concept, and weaknesses in the multifunctional approach. This page highlights insights see appendix 20 for a full description and analysis of the test.

The aim with the mock-up where to identify the extension procedure and its interaction areas:

1 – The interaction in the doubled upholster ends

2– The interaction when closing up the ends

3– The interaction when extending from
combi pram 80 cm to full length 98cm



72 Test pictures

DUMMIES

For testing the 1:1 prototypes, three dummies have been made. These are made from night-gowns which are the size of a child of the last mentioned 1 month and 9 months and 18 months with a height of 86 cm.

The two smallest dummies are filled with weight.

– **Newborn/ 1 month – 3.7 kg**

– **9 months – 10 kg**

This corresponds to the average weight of a baby boy in the two age groups (sygebørn.dk, 2024).



73

ITERATION 1

The first iteration had foam in all the flaps and unfolded flat as a large rectangular square. When the flaps were folded over each other, problems arose in relation to the thicknesses and the folds that were possible. Therefore, the foam in the end flaps was removed in the second iteration (illu. 74).

ITERATION 2

Without foam in the end flaps, the concept was now more manageable, but there were still many unnecessary overlaps of fabric, and a solution was still missing for how the sides should meet each other and ensure a durable closure.



74 Test pictures

IDERATION 3

In the third iteration, the end flaps are completely removed, and a zipper is added in the corners for easier interaction. Thus, a choice was also made to simplify the concept further by removing the requirement for extension to full length. This requirement created complexity for the product in relation to the daily usage scenario, which is weighted higher than the "one-time" need to expand the carrycot when the child grows too long to fit the short size.



75 Test pictures

Test results:

- 1 – Removing the upholstered ends
- 2- Applying zippers in each corner
- 3- Opt out the demand for full length ...*(for now)*

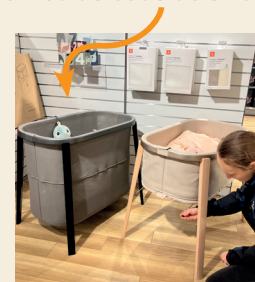
In general: Interaction is a learning process and for someone who has never seen this concept before it might be hard to decode. The concept is based on four existing products: side crib, soft lift, parm and nest - their interaction points and style are investigated further, to learn how each of them create a good user experience for the parents.

INTERACTION INSPIRATION

In a baby retail store acting out and testing was conducted with the pram, hard lift, soft lift, travel bed, side crib and baby nest. The dummies were brought to interact with the different products and test the handling of each product with weight.



"None of the baby beds were presented as bedside cribs in the store"



76 Interaction test pictures

The main part of the tests was made on lifts since they must be moved when the child is in, thereby representing the most demands in regard to parents interaction. For full test setup se appendix 21.

HANDLING TEST

- Nicer to grip sideways around the handles, than straight down one handle.
- Two split handles pose a drop risk



78 Interaction test pictures

HARD LIFT VS. SOFT LIFT - TEST



- A very high lift
- Canopy most go down



- Easy to place in the pram
- Safe and secure lift

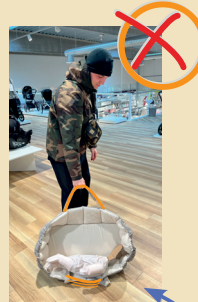


- A long distance from handel to bottom
- Hard frames against the leg



79 Interaction test pictures

WORST CASE SENARIO - SOFT LIFT TEST



80 Worst case test

The product category of soft lifts is the most pleasant to carry around, because of the positioning and length of the handles, weight, and softness of the product. Soft lifts are easy to manoeuvre inside the pram, but they don't provide the same feeling of safety when the baby are left unattended surrounded by only soft sides.

"How to design a pleasant product for the parents that make up a safe and ergonomic space for the baby?"

"The madras in soft lift are sparse"

A CARRYCOT IS ALSO NEED TO BE MOUNTED



81 Pram mount

ALL IN ONE - EXPERT TOOL



82 Folding prototype

The mock-up is further developed into a prototype where the concepts interaction can be tested. In addition, it is determined that the carrycot should fit the existing Vida frame from Odder, while the bedside function stills need an indoor bed frame to work.

When the sides are folded down, being a nest, the weather protective fabric and integrated handles are hidden, giving a more aesthetically pleasing appearance. However, the concept has its limitations when used as a side crib and travel bed, where the weather protective textile is mainly visible.

Upon further testing, it turned out that the prototype still had several problems, such as in relation to several of the design criteria that were determined at the start of the concept. This was for example, regarding the concept still lacking a canopy and an apron to protect the child from the weather conditions outdoors.

Furthermore, the concept does not feel rigid enough for outdoor use, where the concept must, among other things, be mounted on a pram frame. The prototype mainly consists of a firm foam mattress as this material provides the lightness desired during transport, as well as a soft expression that suits indoors. The foam just does not provide enough rigidity to create a safe place for the child if left unattended on the pram frame (app. 22).

The carrying function in the product is also not optimal in relation to the desired use scenario for children from 0-1 years. All in all, the product is complex to use and there are major internal concerns about whether parents really want to zip and fold the same product an expected number of times a day.

Still a little blinded by an all-in-one solution, the group were asked at Milestone 3:

*"Who asked for the Swiss Army Knife?"
(Christian Tollestrup).*

In the attempt to make an expert tool, the concept ended up being a Swiss Army Knife trying to do too much and ending up doing everything equally bad.

Reflection in- action

At this point in the project, we see three options for the scope of the solution, each with their own advantages and challenges (illu. 83).

We must carefully consider the pros and cons of each tier and make a decision based on our goals, resources, and the customer's needs.

1. Focus on designing a solution primarily for indoor use, suitable for infants aged 0-1 years, to ensure an optimal and safe sleep experience.
2. Expand the scope to include outdoor use in the first year, adding features for weather protection and portability that allows parents to take the product on the go.
3. Include outdoor naps for children up to 3 years, offering a long-lasting solution but requiring more complex design and functionality.

1

Sleep inside,
0-1 years old



2

Sleep inside and
outside, 0-1 years old



3

Sleep inside and
outside, 0-1 years old,
naps 0-3 years old



*"How far can we get and still
get a great product?"*

83 Three concept scopes

BUSINESS PERSPECTIVE

WHAT ARE THE VALUE FOR USER, MARKET AND COMPANY?

The multifunctional solution proposal face challenges in implementation for several reasons. First, trying to incorporate numerous features into a single product led to high complexity without a successful outcome. Although the reference products are fundamentally similar to each other, they have different requirements.

To be able to prioritize demands and have control over what the key story is and what value the product provides a look back at what felt like the key insights for user, market and eventually Odder was done.

COMPANY VALUE

A product that is safe and ergonomic for children and easy for parents to handle (app. 11).

"The classic lift has been pushed out of the market due to the soft lift"

– Fie Elvira Storm, Product manager Odder

"Soft lifts are much easier to carry around – but they do not create the same "safe space" as the classic lift can. Soft lifts also have a almost non-existent mattress"

– Fie Elvira Storm, Product manager Odder

MARKET VALUE

A product that creates fewer sleeping places for the child between 0-12 months

"It is good for the child that the places to sleep during the day are minimized to one or two places..." "Fewer places to sleep can help create security. It becomes more obvious to your child that he needs to sleep, when it is tucked in time and time again in the same cozy, calm and predictable place." (Bihlet, 2022)

USER VALUE

A product that gives parents fewer worries, through fewer choices (app. 5)

"It was difficult because we didn't know our needs at all and because they are expensive. Baby monitors were a bit difficult, because they are a bit expensive, and car seats are a huge jungle, which was probably the most difficult to navigate." – Anne K

"It seems like a jungle to figure out what is the right purchase for us, so it quickly became easiest to just buy the "most expensive" one to be on the safe side"

– Mathias

"I have read everything there is to read on the internet...I have been so afraid of making the wrong choice. But then, we have not had any doubts IF we should buy one, more just which one" – Marie

TOO MULTIFUNCTIONAL?!

Having a hard time finding out what and if there is the joint key problem which create the base for the concept. Thoughts about ergonomic, lifestyle, and simplifying the market is too much to gasp up on, if the user should understand the story-telling and use of the product.

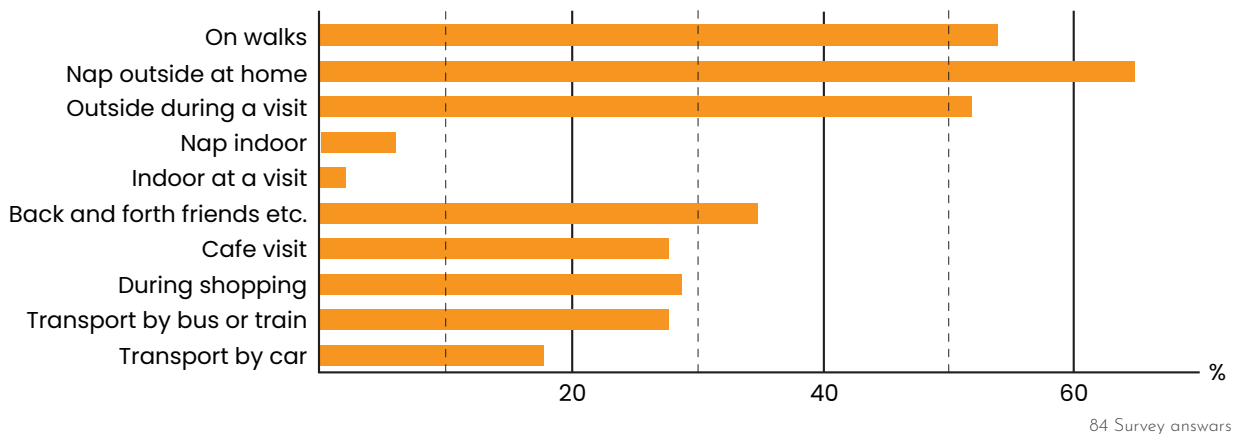
"If you had to choose only ONE problem, what is the most important 'concrete user problem ? Need to be user data based" – Linda Nhu Laursen

Answer:

"TRANSITION?"

The transition from indoor to outdoor is the one key challenge, which also constituted the most difficult element of the multifunctional concept that must be the key problem.

LIMITING THE PROJECT



Trying to avoid the “Swiss Army Knife – effect” reflected on in the preceding sections, a decision was made to limit the project not only by “just” looking at one key problem but also focus exclusively on the design of the carrycot. The possibility of designing an outdoor or an indoor frame are ruled out. This decision is also based on insights from a conducted survey (app. 17) that identified needs and challenges for parents in the use of prams in different situations. The responses shows that the three most common usage scenarios for prams during a week are “nap outside the home”, “walk” and “nap outside with others” (illu. 84). This indicates that it is primarily the carrycot part of the pram that has value, in two out of the three most common situations the pram is used stationary.

This is further supported by other responses from the survey, where the parents mention limitations when using the pram, such as that it is large and heavy to transport, especially up and down stairs and in narrow environments. A picture were drawn that parent desire to leave the pram at home as soon as the child can be placed safely in the stroller. The stroller are must lighter and compact and that what’s makes it more attractive than the pram. If the carrycot could provide the same or better convenience for the parent it would create a stronger product-user fit. The carrycot is the babies’ actually napping place and thus the essential part to be able to bring.

Survey question: Have you felt restricted by your pram?

“Sometimes there are only stairs or the shops are too small.” – Survey answer no. 10

“Limited space in small staircase” – Survey answer no. 31

“Yes, it is a big thing. Easier with a stroller.” – Survey answer no. 44

“Yes, it’s a bit of a hassle – with child no. 3, we already use it significantly less.”

– Survey answer no. 46

“No, used Babyjogger.” – Survey answer no. 60

“Yes and no. I bought one that suited our needs. However, a pram quickly becomes large and heavy to transport in e.g. car, but then I use the stroller instead.”

– Survey answer no. 73

In addition, the parents emphasize that challenges in getting out the door are primarily due to factors such as the baby’s temperament, the need to adhere to scheduled sleeping and eating times, and the practicality of having to handle baby equipment along the way. Based on these insights, the focus is now primarily on the “worst case” user, who are first-time

parents who live in an apartment. In this scenario, daily life involves repeatedly carrying the baby up and down stairs in narrow passages and hallways. As part of the concept, the starting point will continue to be Odder’s existing pram frame Vida, which is assessed to fulfill its function well and meet the specific needs of the target group as it is now.

INDOOR / OUTDOOR

THE TRANSITION FROM OUTDOOR TO INDOOR IS *MAYBE* THE KEY

Reframing the Insight

The transition from indoor to napping outdoor or reverse can be a challenging process for many parents. Some parents experience being trapped in the car, even when they reach their destination, due to fear of waking their sleeping baby (app. 1 & 7):

"Sometimes we have had to stay in the car for a little extra time even though we were there because he had just fallen sleep and we were afraid to wake him" - Christina

It is clear that parents have respect for the child's nap and they will do what they can to avoid waking up a baby:

"I have only just started leaving her in the yard - before I have gone for walks around the block until she had finished her nap" - Mathilde

These statements underline the need for a more hassle-free transition between indoor and outdoor environments when it comes to sleeping children.

With these insights in mind, a new concept direction for this project is given. The goal is still to design a expert tool as the future pram, by focusing on only one key problem, that might be the hardest. Creating a seamless transition between indoor and outdoor use, the opportunity to develop a pram that can meet the parents' needs in the transition between having the child inside before naps to the child lying down and sleeping outside.

Exploration

The stationary use of the pram outdoors has historically seen always been a part of the usage (app. 17). Parents says ***"I thought it was nice that he sleeps outside so the home doesn't have to be quiet when he sleeps - I also love the fresh air we both get"*** - Survey answer no. 3. Sleeping outdoors not only gives the child the opportunity to rest in the fresh air, but it also allows the parents to move and carry out activities while the child sleeps safely in the pram. ***"The pram is practical both when you're at home and out - safe space for the child always"*** - Survey answer no. 26.

To meet the potential of integrating the carrycot as a lift that can be used indoors, it is crucial to look at indoor and outdoor products to identify principles as form, materials and colors that can be transferred to the concept development. The full analysis is to be seen in appendix 23.

INDOOR PRODUCTS

The carrycot must have a damped dusty colour.

The inside of the carrycot must have delicate details inside as it is seen as "indoor"

The appearance should be sleek with tensioned lines.



85 Indoor products

OUTDOOR

The surface that is in contact with dirty surfaces should be a hard plastic.

The surface that is in contact with dirty surfaces should have larger radius curves.

Dark colours.



86 Outdoor products

MEDIAN PRODUCTS

The median products represent a range of products which both fits indoor and outdoor. Some products are chosen upon purchase to be an indoor or outdoor product, where others move back and forth depending on factors like weather, season, situation or need.



Wheater resistant materials in high quality, no matter the material.

Nature colours.

Few materials.



87 Median products

As the carrycot must fit with inside and outside, a mixture of demands from inside and outside products must be applied. As the inside of the pram is purely for the baby, only inside demands should be applied. The bottom of it needs to have a hard surface with big radial curves and dark colours. In between the bottom and inside does it have to have rough water resistant fabric in damped colours.

DESIGN BRIEF 5.0

Through in-depth user research, the team was able to concretize the wishes, worries and needs that new parents often face. Through this it was possible to map the daily routine and the use of the many new products targeted at the age group of 0–1-year-olds. The user data is held up against previous insights from market research and inputs from a health nurse.

With a basic knowledge of the market, the user group and the relevant product categories, the insights must be transformed into a sharper concept direction.

A summarize of the insights from previous phases and the design parameters for the latest concepts is made, to get an overview of the foundation for the further concept development.

X

The concept should combine the best features from both the pram and combi pram.

Focussing on the baby's need from 0–12 mth

!

02 THE PRAM

Very simple construction of the carrycot

Increased product focus between 0–1 years

Pram or combi pram: preference influenced by residential location

The stroller is not designed to provide comfortable naps on everyday basis.

It is not necessarily the child's comfort that always has the highest priority.

!

05 TRANSITIONING

Weather resistant materials in high quality, no matter the material.

Nature colours.

Few materials.

!

03 MARKET

The recommendations regarding maintenance and storage do not match the users' behaviour.

The features of the frame is the main selling point other than the carrycot size.

Regional differences in which brands are most popular

The biggest development in recent times is the combi prams

The product developer worries about child's comfort, due to limited sleeping space and the risk of premature transition to a stroller.

04 Users

The diaper bag has become an expert tool to the parent, resulting in the feeling of freedom and being well prepared.

Avoid unnecessary baby equipment, to potentially reduce stress factors.

Rigid for outdoor use, cozy for indoor comfort

DESIGN PARAMETERS

1. SIMPLIFY PARENTS' PURCHASES: ADAPT FUNCTIONS TO SUIT VARIOUS SLEEPING SCENARIOS:

- Outdoor stationary use
- On-the-go- outdoor naps
- Overnight trips
- Indoor use at home
- Beside the bed

2. ENSURE COMFORT FOR BABY AND MINIMIZE EXTERNAL STIMULI

3. RIGID FOR OUTDOOR USE, COZY FOR INDOOR COMFORT.

4. OPTIMIZE SIZE FOR 0-3 YEAR-OLDS:

0–1 years Frame/bottom dimensions: 70x30 cm

1–3 years Frame/bottom dimensions: 98x30 cm

THE NEW CARRYCOT

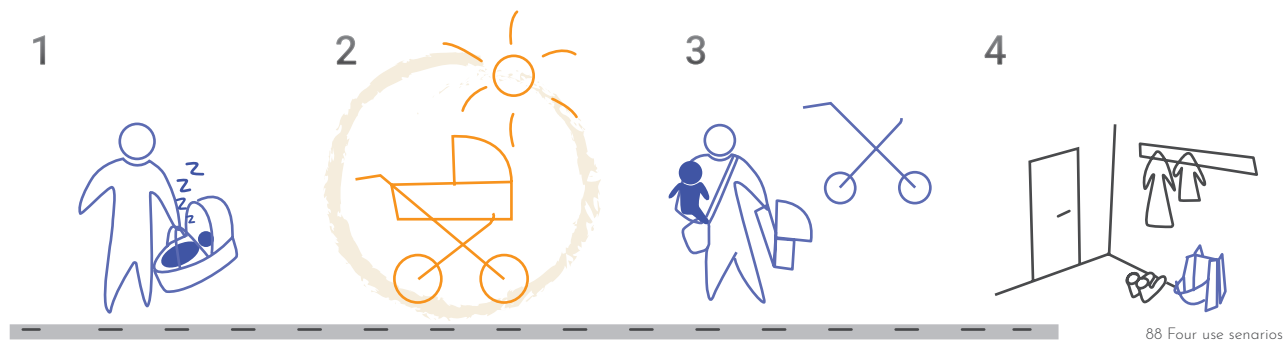
06 ONE KEY PROBLEM

This chapter describes the concept development turning into the final concept. It begins by outlining the various usage scenarios further exploring the contextual level of the solution space (Lerdahl, 2001). This is followed by the concept development and testing phase with prototypes delving into the principal level to understand the working principles of the carrycot (Lerdahl, 2001). Lastly, it discusses the styling, including design considerations, aesthetic choices and the color scheme chosen for the concept to fit the case company.



USER SCENARIOS

FORM INDOOR TO OUTDOOR WITH A BABY



DESIGN PARAMETERS

1. CARRYING A BABY IN CARRYCOT

Must not put the baby in danger (safe lifting)

Fits through standard doorways.

2. CLASSIC UNATTEND USE

Must mount securely on frame.

Requires weather protection.

3. CARRY INDOOR - BABY AWAKE

Carry baby, carrycot & diaperbag

Lightweight for effortless lifting.

4. INDOOR STORAGE

Fitting indoor aesthetic.

Compresses for minimal storage space.

The concept direction is updated so the focus is on developing a carrycot solution that meets the needs of first-time parents who live in an apartment. Attention is therefore directed exclusively to the carrycot in order to create an integrated solution that can be used both indoors and outdoors and meet the different usage scenarios that arise in these contexts.

The new purpose giving to the carrycot as is today, with the wish to easily transform and transport the child from outdoor to indoor some working principles from other products that "transforms" are analysed. Product that can fold or be carried. These parameters are the key demands to fulfil the described scenarios. The brainstorm of products that constituted the fundament for the following chapters concept development can be seen in appendix 24.

LIFTING PRINCIPLES

SCENARIO 1 & 3

The demands from scenario 1 and 3 requires a safe and effortless lifting of the new carrycot, looking at other products the way to carry can be divided into three different categories: in the hand, over the shoulder and on the back (illu 89). Based on bags as product categories, a test was conducted to figure out the right principle to create a convenient way to carry.

Scenario 1 requires that a child can be lifted while it is laying down horizontal, the possibility to carry on the back is ruled out. Each category of lifting principle must be tested regarding ease, comfort (user experience) and maximum carry limit (distance [m]).

IN HAND



OVER THE SHOULDER



ON THE BACK



89 Four use scenarios

ESTIMATED MAXIMUM WEIGHT LOAD

The maximum weight that the parents needs to be able to carry is a 12-month baby plus the weight of the carrycot, giving a total "worst case" carrying of weight of 17,5 kg.

WEIGHT OF A 12 MTH BABY

12 mth		
	Boy	Girl
Small	8.7 kg	8 kg
Avarage	11.8 kg	10.2 kg
Big	13 kg	12 kg

(sygebørn.dk, 2024)

ESTIMATED WEIGHT OF THE CONCEPT

Combi carrycot	
Cybex - Gazelle S	4,5 kg
Britax - SMILE 4	3,5 kg
Maxi - cosi - Oria	4 kg

(BabySam, 2024d)

The goal of the following test is to evaluate each carrying principles, when walking around with 17,5 kg.



IN HAND

Longest distance: approx. 75 meters

User experience

- Numbing the arm or fingers
- Hitting against the leg when walking
- + quick to pick up from the frame.

90

The in hand solution is really depending on the users strength in the hand, upper and lower arm and several female participants have a hard time even lifting the bags this way (app. 24).

The overall best experience came from the "same side shoulder strap" as the principle allows the user to carry the weight close to the body and have a easy mount and demount scenario. After testing six different carrying principles the best results came with the shoulder solutions.

SHOULDER

Longest distance: approx. 750 meters

User experience

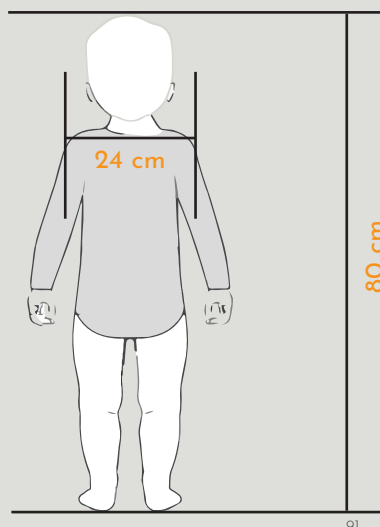
- Need padding on the neck
- + Nice with weight support on the hip
- + Easy to mount and demount



- The baby needs to be carried lying flat
- The "new" carrycot should give the use free mobility for the legs when walking
- Padding on the strap to soften and distribute the weight.

X SPECIFICATION

- The carrycot is lifted with a center-based shoulder strap



91

MINIMUM INNER DIMENSIONS

The minimum internal dimension of the carrycot are determining by a 12 month baby's measurements (sygebørn.dk, 2024)



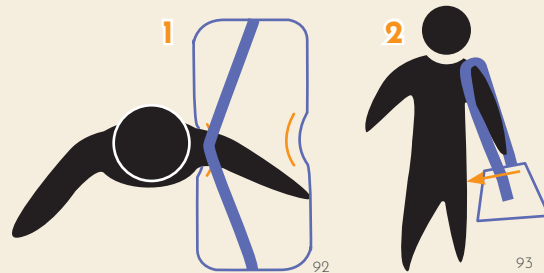
Length 80 cm
Weith 24 cm

SUPPORTING THE WEIGHT

To embrace the principle of lifting with one strap, and the carrycot hanging on the users' side different initiatives are tested.

1 – Shaping the bottom plate

2 – Downsize the top frame



1 - SHAPING

From previous test of the classic lift it was observed that the bottom plate and top frame is irritating to interfere with during walks, they are hard against the legs and gets in the way when walking. Therefore the bottom plate where shaped after the hip, the support area when lifting the “new” carrycot. Simply by making an arch in the bottom (illu. 92 & 94) the movement of the legs when walking and the feel on the hip where improved.



94 Shaping the bottom



Minimum 30 cm space on the bottom plate



The arch in the bottom frame between 16-22 cm



95 Top frame size

2 - ANGLE

The width of the top frame were made less wide, to force the weight of the carrycot to fall in towards the carrier (illu. 93). This resulting in a noticeable difference, as the smaller the top frame where more natural that the shoulder strap stays on the shoulder (illu. 95) leading to a more secure lift.

2.5 - MINIMUM WIDTH

To decide the angle of the top, a minimum hole test where conducted, in order to ensure that the baby could still be placed within the carrycot comfortably (illu. 96).



96 Top frame size



Minimum internal width of 28 cm at the top opening



Keep the top more narrow than the bottom plate

The full test setup can be seen in appendix 25 & 26.



Participants placed the carrycot on both right and left shoulder



carrycot must be symmetrical

DIMENSIONS

The Carrycot have both inner and outer dimensions limitations.

INNER LIMITATIONS - MINIMUM SIZE OF 80*30*24.

A prototype with a arch in the bottom plate, and narrower top frame where created in regard to previous test. The outer dimensions might conflict with the narrow doorways and hallways getting from senario 1 to 2. The minimum width of a standard door is 70 cm,

and the carrier should be able to walk though these comfortable with the new carrycot. A carrying test of a full size carrycot and the prototype with the minimum dimension is carried out (illu. 97). Full test se appendix 37.



97 Doorway test

The prototype made it clear that there was a huge difference between carrying the new carrycot and full size carrycot. It is not possible to get through a standard door with the fullsize carrycot which made the group reflect on the scenarios and definitively excluding the option full length from the further development. This led to an exclusion of the carrycot being used after the child turns 1 years old. Thereby scenario 3 disappears from the concept usage scenario, as this scenario was particularly aimed at an older child too large to be carried laying in the carrycot.

3. CARRY INDOOR - BABY AWAKE

Carry baby, carrycot & diaperbag

Lightweight for effortless lifting.



98

A conflict starting to occur due to the bottom plate with a minimum width of 30 cm, a top hole that had to be minimum 28 cm. The top frame itself have a diameter of 12 mm.

Therefor it was concluded that the trapez shape and the indents had higher priorate than keeping the new carrycot as narrow as possible. Resulting in dimensions of 34*80*28 cm

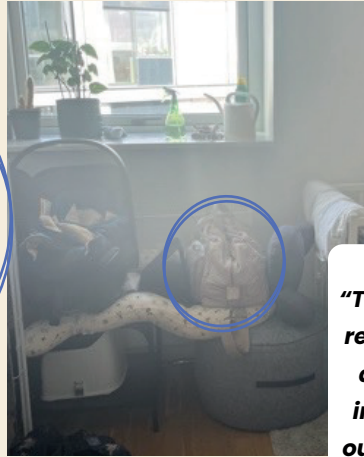
STORAGE

SCENARIO 4

While limitations for the lifting scenario 1 and 3 were tested, further user research was done to find out more about the requirements for the storage scenario. It was yet to be determined where the “new” carrycot would be stored in the users home regarding scenario 4. Two pairs of parents, both living in apartments, were interviewed (app. 7 & 16) to understand where present baby equipment is stored.



99 User storage



Anne & Jakob

- Live in an apartment with an elevator
- Spacious hallway,
- Easy access from sidewalk up in the apartment with the pram
- Pram is stored in the entrance
- Additional baby equipment storage in office/ children's room

“The most important thing is that the pram is ‘just’ ready for naps, which are not too long in between, and if the entrance gets a bit crowded, it comes into the office, so the door can be closed and it is out of sight – it often comes into the office” – Anne

Mathilde & Tobias

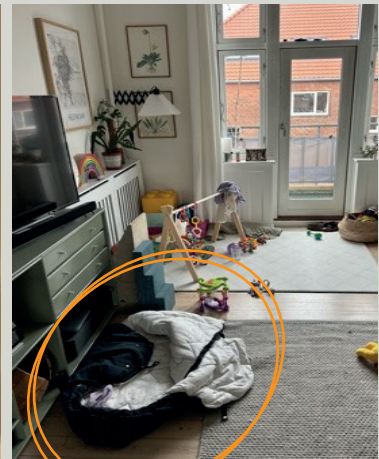
- Live at 4th floor without any elevator
- Narrow entrance
- Pram is stored in a shed in the backyard
- Their child doesn't have a room, so the diaper bag is stored in the hallway and the sleeping bag lift is left in the living room

“There is a maximum of 2-3 hours in between, we have to use it [Voksi bag], so it mostly just lives in a corner of the living room or on the dining table – well just the last place where she was unpacked from her last nap”

– Mathilde



100 User storage



Based on the interview, the target group is narrowed down to the “worst case” scenario users who live in an apartment without an elevator, and must carry their child up and down to get access to the pram. This context is chosen as it presents the most challenging scenarios.

“if you solve the hardest part you solve it all”

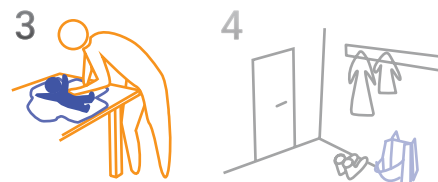
The interview also made it clear that a new 3 scenario must be considered (illu 101).



DESIGN PARAMETER

3. INDOOR PREPARATION BEFORE AND AFTER

- Able to get clothes on while laying soft
- The baby can lie safely swaddled in the carrycot



FEASIBLE OUTDOOR

SENARIO 2

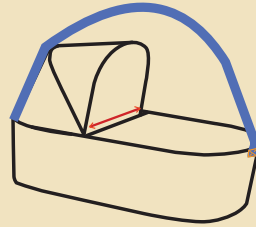
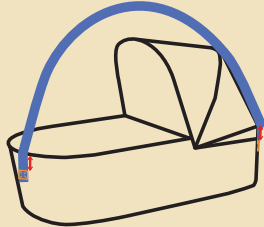
While getting the carrycot to fit inside scenario 1, 3 and 4 several outdoor features like the canopy, apron and how to establish some resistant sides must be developed to fulfill scenario 2 – unattended outdoor use. (app. 28)

CANOPY

MOUNTING THE CANOPY

On the side

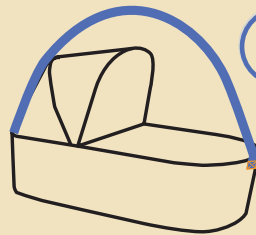
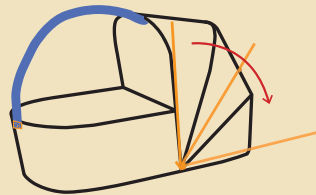
Hinder the possibility to attach the long strap on the top frame, which are a legal requirement (Dansk Standard, 2022)



On the indside of the frame
This will take up space in the already downsides top-frame, which make it hard to take the baby up from the carrycot.

On the bottom plate

Change the attachment point in the bottom, interfering with the curvature shaped on the bottom.



On top of the top frame

102 Canopy placement



103

When the canopy is raised the strap will lean on the canopy braces, which leads to a inappropriate force detaching the canopy from the frame (illu. 103).

The canopy measurement: H 30cm x L 30 cm x W 28 cm
With these measurements the canopy is attached before the curvature in the bottom begins, which means that the canopy will stop in front of the body when lifting the carrycot, and thereby not interfering with curve for hip support (illu. 103).



Canopy mounted on top of the frame



The canopy should stop in front of the body to avoid interfering with the hip support shape

THE VIEW

It is observed while making the canopy test that it feels odd not to be able to see the baby, when the canopy is raised and you are walking around with the carrycot.

"It is hard to the determined rather the baby stay in place... it is not optimal"

By a quick test walking on stairs (illu. 104), it is determined that the canopy should be down when the carrycot is lifted. It affects both the view on the surroundings and cause a risk factor because it is not physically possible to nurse the baby with the shoulder strap on and the canopy up (illu 105), without risking the strap falling of the carries shoulder.

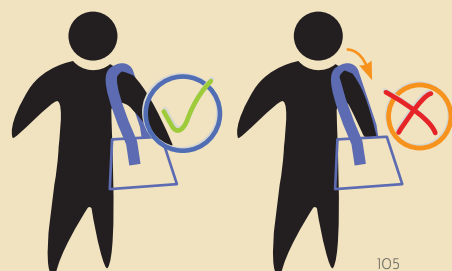


104 Walking test



Be able to see the baby when walking

The canopy should not be up when the carrycot is lifted



105

APRON

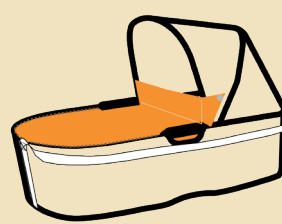
Various fastening methods for the apron have been analyzed and tested including zippers, elastic, buttons, and magnets (app. 29).

“There are several doctors who are working to ban soft lifts, as there are examples of several serious injuries caused by these”

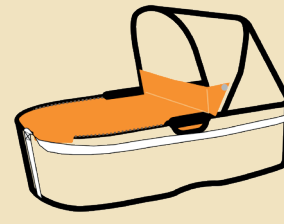
– Fie Elvira Storm, Product manager Odder

Several articles and comments have appeared (Forbrugerrådet Tænk, 2024) (Politikken, 2023), during this project warning about the soft lift, which is often used for the previously described scenario, where the parents climb stairs with their baby. Thereby the apron is used as a kind of “harness” that prevents the baby from sliding out of the carrycot if it is lifted inappropriately. This requires a secure attachment to the carrycot, which cannot be achieved with magnets, buttons, or elastic.

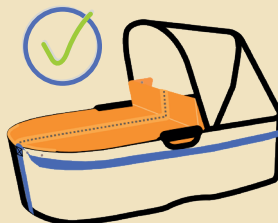
The chosen solution for the carrycot have a centrally located zipper, magnets at the ends and stitching along the sides (illu. 106), which ensure a solid attachment of the apron to the carrycot. Due to registrations, there is also the option of mounting a harness for the baby inside the carrycot for extra safety (Dansk standard, 2022).



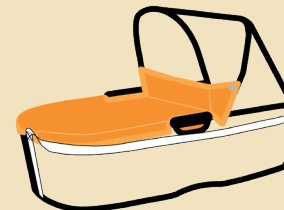
Single zipper
Magnets hold the wind shield



Zipper in both sides
Not attach in the bottom



Single center zipper
Odder signature



Traditinel
Form sewn cover

106 Apron attachment

X

Permanently mounted apron with center zipper

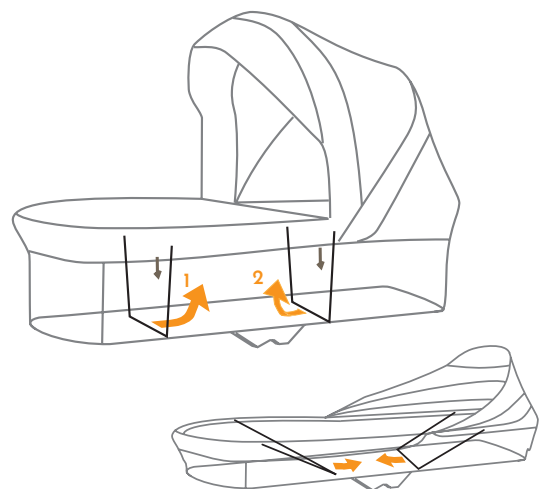
COLLAPSIBLE SIDES

THE NEW SCENARIO 3

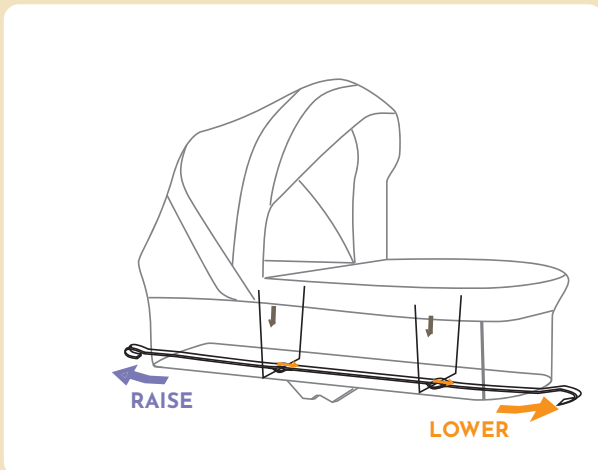
- “HOW TO DO THAT EASILY ?!”

With the new 3. senario – preparation before a nap, the carrycot needs to fulfill the new requirements of the possibility to raise and lower the sides of the carrycot while the child is lying on the mattress. There need to be space for the parent to tuck their child in on the soft mattress.

Based on the current way the carrycot is folded flat (illu. 107), and inspiration of an earlier brainstorm appendix different solutions were investigated. The main challenge is to switch between firm when carried and soft when collapsed.(app. 30).



107



108

CONCEPT 1

Pros: One interaction

Cons: Only need a pull in one direction to collapse, thereby don't live up to regulation about 2 integrations

The bracing is positioned so they can be closed in the same direction by pulling a strap in one end. The sides can be raised back up by pulling in the other end. This concept will require a "sandwich bottom" to allow the braces to run freely under the mattress.

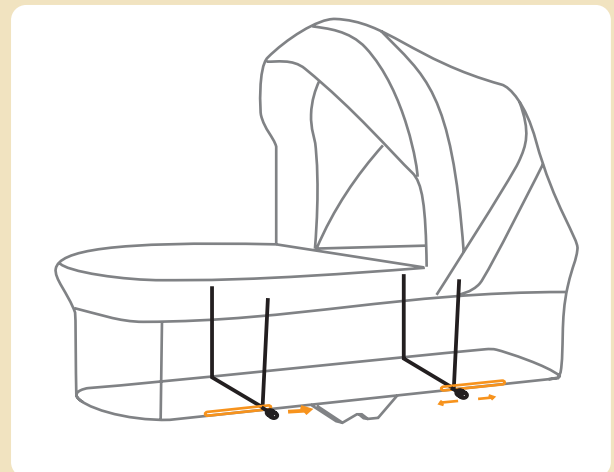
CONCEPT 2

Pros: Simple solution

Cons: Have stuff sticking out the sides, large risk of hitting it unintended

Must have the same "sandwich bottom" construction but are lowered and raised by to external handles. There must be two slits along the side where the handles are able to run.

After further research it is concluded that none of the two concepts above complies with the Danish standard requirement for a multi-factor locking mechanism to avoid unattended release of the lock (Dansk standard, 2022).



109

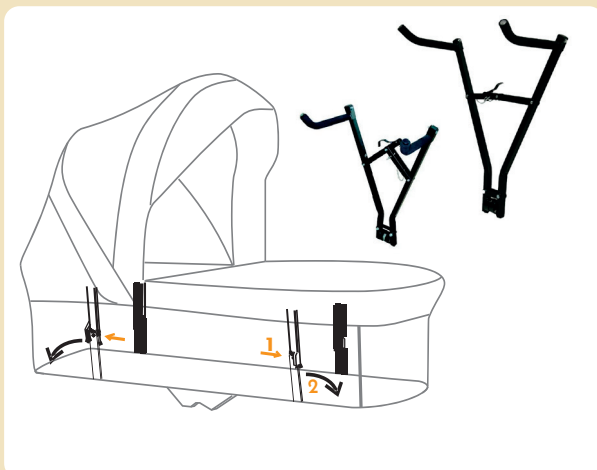
CONCEPT 3

Pros: Only takes up space in the sides

Cons: Four separate interactions

The third concept avoids the large interaction areas in the bottom, that are needed to fold the bracing up and down. With use of hinge bracket, know from a bike rack (illu. 110), two metal rods are "spanned" and thus tighten the sides. After several mechanical tests in solid works, the idea is discarded. It wasn't possible to find a way in which the rods can be folded up and down by easy and safe interactions.

The challenge is paused to learn about alternative solutions that can meet the users' needs before and after the baby's nap.



110

SECOND ITERATION ROLL

LIFTING SCENARIO 1

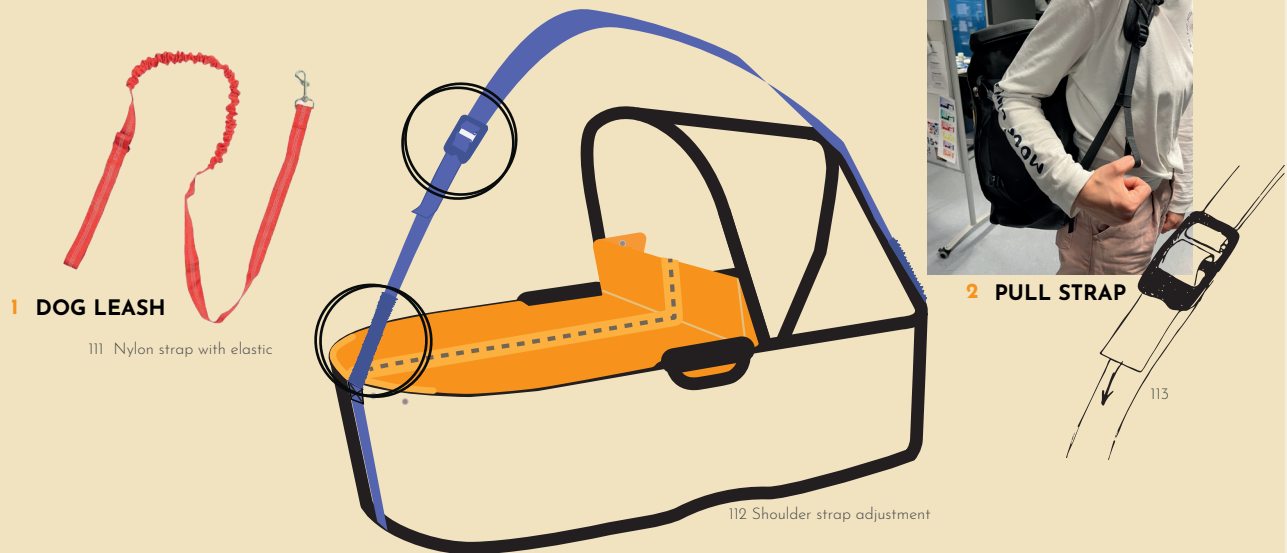
SHOULDER STRAP ADJUSTMENT

The “new” carrycot should not be a one size fits all solution and after multiple test with the prototype it is acknowledged that the shoulder strap needs adjustment opportunities.

On the prototype the shoulder strap is made of elastic with a nonelastic sleeve (illu. 111), which allows for easy retraction and storage along the side of the carrycot. Besides adjustment issues the durability of the elastic over time strikes

some concerns. 1 - Will it lose its elasticity over time? 2 - Does it create difficulties in adjusting the length of the strap?

Approaching these questions different principles are analyzed and tested for the full setup of the test see appendix 31.



1 With a nylon sleeve around it, it is ensured that the elastic is never stretched to a critical point where strain will cause it to lose effect over time. Thereby the elastic wear and tear are no longer a concern.

2 The “pull strap” was the most convenient solution, offering adjustability without pre-defined length settings and adjusting while carrying the carrycot with weight (illu. 105). It is determined that only parts of the shoulder strap are made of elastic, so it would pull tight to the side of the carrycot when it is not in use – maintaining a sleek profile.

+ Adjustment of the shoulder strap

CENTER OF MASS

To ensure the safety of carrying a baby in a carrycot with a shoulder strap, various tests were conducted. When a dummy was placed centrally, the center of mass was well-balanced (illu. 114). Side positions showed good stability when the child leaned against the body, but less so when leaning away. Where the top frame did not rest against the body it was less stable, but not critical. In these scenarios it was possible to move the strap and balance the carrycot more horizontally. (app. 32).

Reflecting on the tests, the weight of the canopy and apron can impact the center of mass and stability. However, the carrycot's rigid sides and apron minimize the risk of a child slipping out.



114 Center of mass test

SHORT TRANSFERS

SCENARIO 3

The shoulder strap is designed for lifting, but it doesn't accommodate the small movements users do when they take on of and off the carrycot (illu. 115) or lift it around the house (illu. 116).

With the choice of a shoulder strap and a need for more handles, different handles were investigated (app. 27). It is chosen that these handles should be integrated into the top of the carrycot to avoid too many loosely hanging elements.

Holes are cut in the side fabric to be able to get a solid grip around the handles, and padding around them to added for comfort (illu. 117).



Handles must be integrated in the top frame



115



116



117 Integrated handles



SPACE FOR CUDDLING

SCENARIO 3

The possibility of getting the baby ready for a nap in the carrycot must be rethought, since the last concepts test didn't work. A new principle came up, the mattress in the carrycot can be removed while the baby is still lying on it. This can be achieved by placing the mattress on a support plate (illu. 118) it has sides with handles, and act like an insert form the bottom to top frame of the "new" carrycot. It ensures that it is easily picked up and put in.

The insert, made of felt sheet for strength and flexibility, and it is used for similar situations (illu. 119)(app. 33). When lifted out, the sides can be folded flat for easier clothing changes (illu. 118).



Mattress insert for easy and free space for preparing for the nap



118 Mattress insert



119 Flat test

MOUNTING ON THE FRAME

SCENARIO 2

When designing the mounting of the carrycot, functionality and ease of use are key. The “new” carrycot concept’s narrowing in the middle, and the mounting must avoid interfering with the carrier’s hip. Traditional carrycots are often centrally mounted on smaller prams and combi prams.

The solution is to mount the bracket under the bottom of the carrycot. The previous comi pram from Odder mounted this way (illu. 120 & 121) so with the starting point in Una 2, a suitable bracket where add to the product proposals. This under-bottom mounting ensures comfortable carrying without bothering the user and additionally does the Una bracket use a wire-release system by a wire running from a release button to a mount underneath (illu. 122). A spring keeps the mount locked.

However, the Una frame is only chosen as a case to give the carrycot concept a case frame (illu. 123). By choosing the Una frame, the carrycot taps into Odders previous design language which may not correspond with their wishes for future styling, which must be further investigated.



Frame mount not interfering with the carriers body



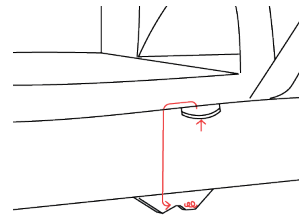
Utilize existing wire system

Using the Odder Una 2 mount and frame



120 Una 2

121 Una 2 mount



122 Wiring system

ODDER UNA 2 FRAME



123

RELEASE HANDLES

On the current carrycots two small handles are often mounted on either side with an integrated release button for the wiring system (illu. 124).

To integrate the release mechanism most seamlessly, in the “new” carrycot different opportunities are investigated (app. 34). The release mechanism must be a two-factor interaction according to Danish Standards (Dansk Standard, 2022) stating that detachment must consist of several interaction. This means the locking mechanism needs to have minimum two interactions to release the carrycot.

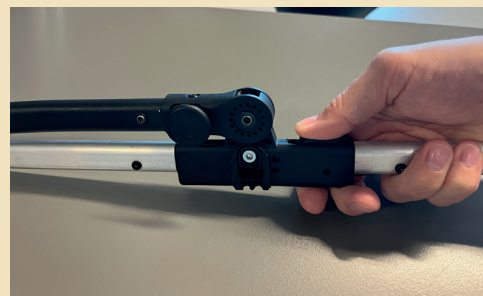
With integrated buttons in each of the two frame handle the two-factor release requirement was achieved. This keeps the mechanism simple and the complexity of the wire system to a minimum. The two spring loaded buttons are pressed down with each thumb thus pulling the wires and opening the locking mechanism. Both buttons must be pressed at the same time for the carrycot to be released and lifted off the frame.



Two-factor interaction release

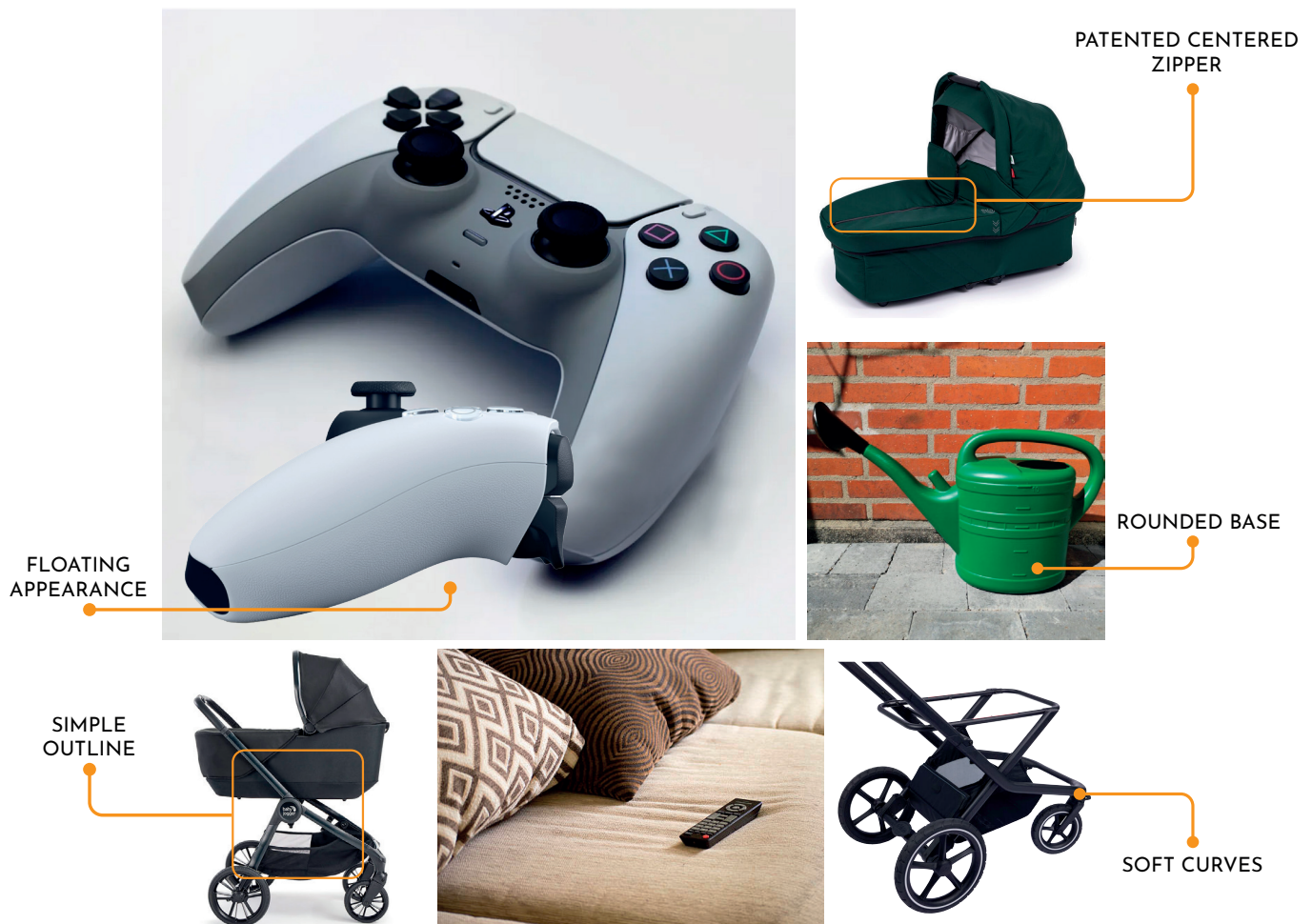


Release button is integrated in the handles



124 Release button

STYLING



125 Style board

The carrycot is a decisive factor for both aesthetics and functionality. When shaping the outline of the carrycot, there are several elements to consider, fitting both indoor, outdoor and on the combi-frame.

Indoor, the carrycot must fit harmoniously into the interior of the home. Its shape and choice of materials should make it suitable for standing on the sofa or the dining table without fearing for scratches or the transferring of dirt. An example is the PlayStation 5 controller's rounded shaped give a floating appearance with small interaction points.

Outdoor, the carrycot must signal robustness and durability to stand on the ground without the parents worrying about its condition. Like a watering can the carrycot needs a hard surface and a rounded transition meeting the ground. The plastic shell with a rounded base curvature, makes the carrycot easier to clean and more resistant to wear and tear, which is ideal when it is placed on different surfaces both outdoor and indoor.

Likewise, the textile has to reflect both the indoor and outdoor use with especially strict requirements for long-lasting outdoor textiles. UV resistance and wind- and waterproofing are just some of the essential factors. Therefore, the current textile on Odder's prams is used for the new carrycot. This is also used on the Odder lift, which already transition between inside and outside. To ensure easy access to the child Odder's uses a patented centered zipper design on the apron, which is today a recognizable feature of their prams and lift.

When the carrycot is to be mounted on a combi pram frame, it will eventually not be the Una 2 frame, which earlier are set as a case. The future Odder combi frame is yet to be revealed, but hypothetically, the Vida frame might serve as a base since it aligns with Odder's design philosophy. Developed in-house, the Vida frame has a strong product-company fit, according to the product manager, Fie Elvira Storm (app. 15).

Vida has simple outline and soft curves, which is a tendency matching with combi frames from other companies. The soft and round curvature should be used to create cohesion between the "new" carrycot and feature frame.

X

- Rounded bottom plastic shell
- Using current Odder outdoor textile
- Have a simple outline and soft curves

The image is the first rendering of the Luna concept, after which significant changes were made to the bottom shell in particular regarding the implementation and protection of the frame mount and to give a more floating appearance.



126 The first render of the "new" carrycot

COLOR SCHEME

In addition to the design of the carrycot, the choice of color is also important for the consumers' perception of it. The choice of colors for the carrycot concept is based on Odder current color palette. However, it is necessary to sort some colors out, as they are deemed not to meet the requirements for indoor product, about taupe colors.

The colors black melange, navy blue and sand are kept, but to ensure that the concept is aesthetically pleasing for the future parents, some new colors have also been chosen, based on analysis of user images throughout the project. These new colors are a dusty light green and a burnt brown. The color palette integrate well into the home of a modern family with young children (illu. 128). Furthermore the colors are selected to ensure that the carrycot is also practical and stylish.



127

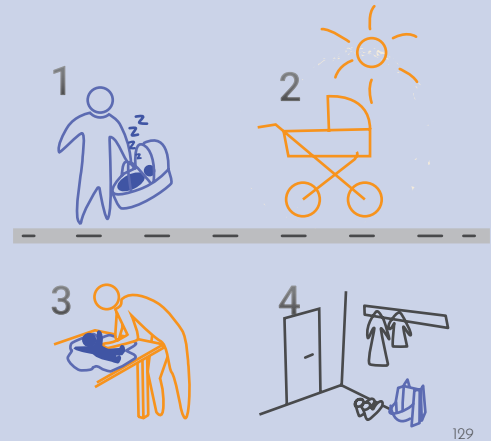


128 User inspiration

DESIGN BREIF 6.0

The insights from market, user and test are divided into 4 user scenarios (illu. 129) clustering all insights and demands for the product proposal of the "new" carrycot.

To achieve a proof-of-concept proposal the team needs to be able to account for the production and construction of the proposal. This way ensuring that the "new" carrycot can come to a realization and future implementation.



DESIGN PARAMETERS

1. CARRYING A BABY IN CARRYCOT

Must not put the baby in danger (safe lifting)

Fits through standard doorways.

2. CLASSIC UNATTEND USE

Must mount securely on frame.

Requires weather protection.

3. INDOOR PREPARATION BEFORE AND AFTER

Able to get clothes on while laying soft

The baby can lie safely swaddled in the carrycot

4. INDOOR STORAGE

Fitting indoor aesthetic.

Compresses for minimal storage space.

The product proposal have the following demands after test and proposal maturing.

X

1 SENARIO

The carrycot is lifted with a center-based shoulder strap

The arch in the bottom frame between 16-22 cm

Keep the top more narrow than the bottom plate

Minimum internal width of 28 cm at the top opening

Be able to see the baby when walking

The canopy should not be up when the carrycot is lifted

Permanently mounted apron with center zipper

Handles must be integrated in the top frame

2 SENARIO

Utilize existing wire system

Using the Odder Una 2 mount and frame

Release button is integrated in the handles

3 SENARIO

Madress insert for esay and free space for prepar- ing for the nap

X

General

Rounded bottom plastic shell

Using current Odder outdoor textile

Have a simple outline and soft curves

+

General

Minimum width and length

Length 80 cm

Weith 24 cm

1 SENARIO

The baby needs to be carried lying flat

The "new" carrycot should give the use free mobili- ty for the legs when walking

Padding on the strap to soften and distribute the weight.

Minimum 30 cm space on the bottom plate

Carrycot must be symmetrical

Adjustment of the shoulder strap

2 SENARIO

Canopy mounted on top of the frame

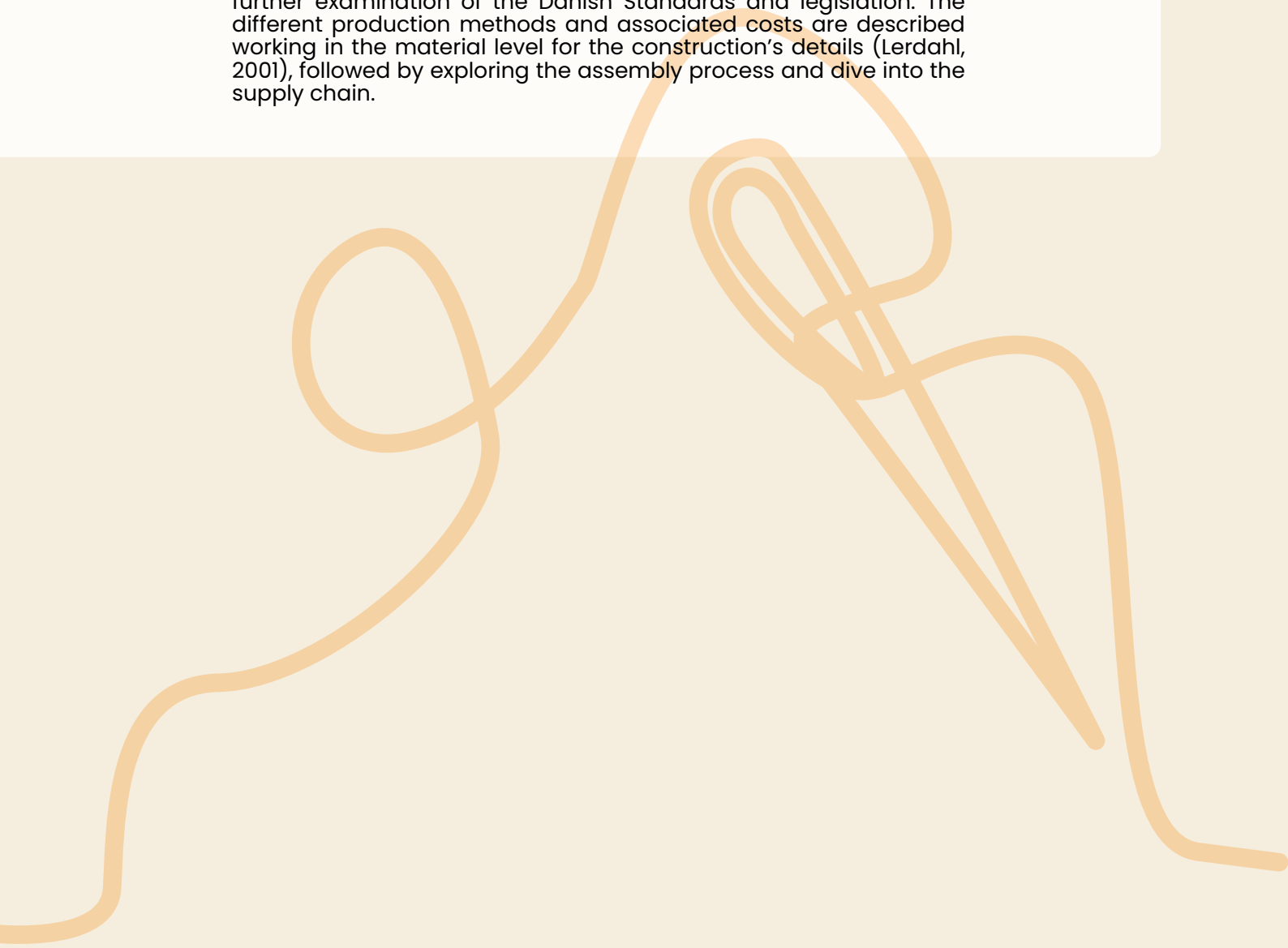
Frame mount not interfering with the carriers body when lifted

Two-factor interaction release

PRODUCTION

07 CONSTRUCTION & PRODUCTION

This phase delves into various production aspects regarding the product. The concept, Luna, is presented followed by feedback and further examination of the Danish Standards and legislation. The different production methods and associated costs are described working in the material level for the construction's details (Lerdahl, 2001), followed by exploring the assembly process and dive into the supply chain.



LUNA



130 LUNA product proposal

The carrycot of the future caters for transport from the apartment down to the street or out into the garden. Today the nap often starts inside, where the child is prepped, after which it is carried out to the pram. By designing the carrycot so that it can be moved into the living room, offers consumers secure transport of their kids all through the nap.

Luna is designed so that it gives the parents comfort in the lifting situation. Here, simple principles such as narrowing at the bottom and a shoulder strap, the weight of the carrycot is shifted from the strength of the individual user's arms and fingers to the larger muscle groups such as the back and legs. With the design of the bottom shell, free movement of the legs and "hips" is provided, even when going up and down stairs, where the worst-case scenario is the parents who live on the 4th floor without an elevator. This provides an everyday life with several daily trips with a 0-1 years old child up and down a small back staircase. Luna provides support for the child with the ergonomically firm mattress and ridged sides, so that the child can lie safely and securely during the entire transport.



"I think that Luna seems like an exciting concept and if it is true that there is a tendency for parents to leave the large pram at home in favors of the stroller, then there is about to be a shift in the Danish tradition"

– Fie Elvira Storm

FEEDBACK AND GUIDELINES

INTERVIEW WITH A ODDER PRODUCT MANAGER

After the concept has reached a more developed stage, an online meeting was held with the product manager at Odder, Fie Elvira Storm, who made her comments on both the Luna concept and the project in general. In addition, the meeting also contributed with additional information about Odder's current and previous products. (app. 15)

COMMENTS ON THE PROJECT AND THE CONCEPT

It is important to pay special attention to the design of the shoulder strap, as it can pose a potential risk of injury if consumers bend forward, as the baby can slip out. There have been several cases like this with soft lifts. But it is quite true that there is a challenge with the traditional lift, which has poor ergonomics and is generally unsuitable for parents regarding weight and how it is carried. It is important to be aware of whether Luna meets the legislation for a pram or a combi pram, as this has a lot to say in relation to the weight it is allowed to carry.

When looking at the mounting of Luna, it is a good idea to use "proven technology" and take existing solutions as a starting point. Often, the bracket is something that is mounted afterwards, so it will always be possible to replace it if an update is needed. Other inputs imply that ventilation could be considered in the shell to ensure optimal comfort, especially if the product is to be used in different climates.

"I think the concept is exciting first of all"

NEW THINGS IN STORE FOR ODDER

We, at Odder, are seeing an increasing number of sales for combi prams especially in the cities. That is why Odder is also working on a new combi pram. The new combi pram is centre-mounted, although we do not see it as the best solution, it is a frame design that we have bought the rights to. The center-mounted frames start to sag over time.

Another change taking place is that the bottom plates in the current models are to be replaced with a PP base plate. The plywood used today is not ideal in relation to moisture and mold, as chemical treatment is necessary, which we would

like to avoid in a baby's product. We still see a PP base plate complying with our vision regarding sustainability and environmental awareness, as this type of plastic is one of the most typical in Europe, so recycling is big in that area.

"Our new combi pram are also centrally mounted, but this does not mean that it is the best solution"

"It will be a PP bottom - It was chosen because it is the type of plastic that is the "easiest" to recycle"

ODDER'S USE OF COMPONENTS

Looking at the components that Odder uses, there is an effort to reuse in-house designed components in future models. This is an advantage in relation to reimbursing the costs of their design and production, and it makes it possible to stick to the same supplier. For example, Odder has designed the canopy hinge that is used on the Vida model, which is from an earlier model. It is also the same type of textile used on different models. Odder also often uses standard components, as spending money on a specially designed component cannot be justified if the only difference is a small aesthetic change. If the product is successful, then it is something that can be invested in while updating the model. Sometimes products just need to get off the ramp.

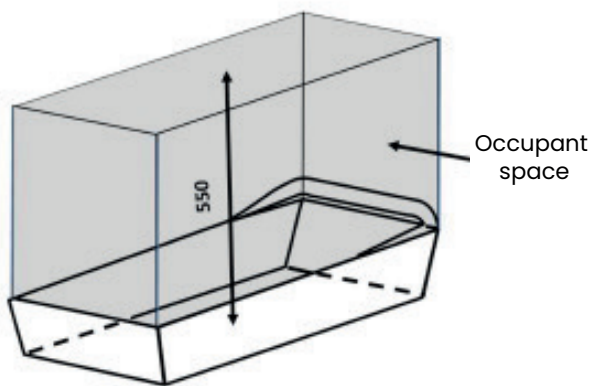
"The entire Vida model is largely designed in-house"



DANISH STANDARDS AND LEGISLATION

After the interview with Fie Elvira Storm, it became clear that legislation for prams and combi prams differs based on an internal length of over or under 800 mm. Until late in the project, the Luna concept was considered to be in a gray area between combi prams, meant for children up to six months, and prams, meant for children up to three years. This distinction is crucial, as a carrycot under 800 mm can only be used for children up to 9 kg, while Luna is designed for children up to one year and must support up to 13 kg.

Additionally, there are changes in the legal requirements for occupant space. A carrycot under 800 mm must have occupant space from the bottom to the top frame, whereas one over 800 mm carrycots must have space 550 mm above the bottom (illu. 132). It's unclear how the canopy affects this, but it's assumed it doesn't impact the occupant space as it can be folded down. Therefore, it's not an issue if Luna's shoulder strap is within the occupant space when in use, as long as it can be stowed along the side (illu. 133).



132 (Dansk Standard, 2022)



133

SIZE CHANGE

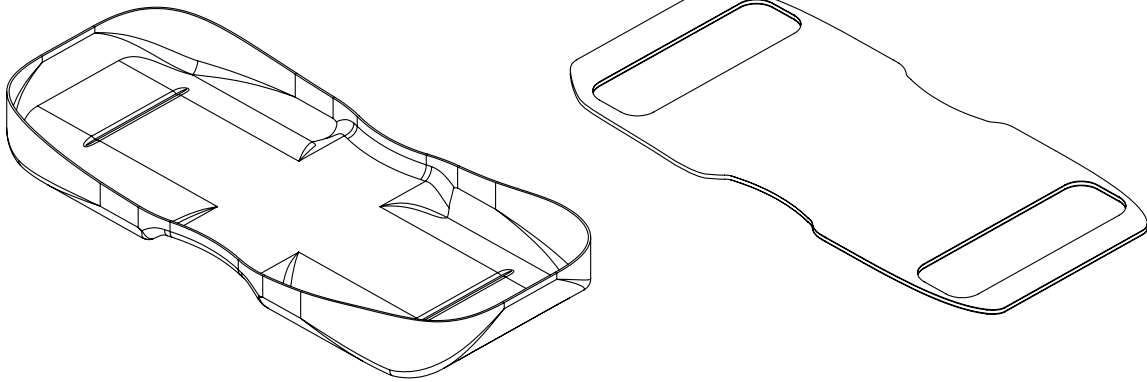
Further studying Danish Standards and the size of a large one-year-old boy, changes have been made to the carrycot's dimensions (illu. 134). The length has been adjusted to 85 cm to meet the needs of children and parents, ensuring Luna complies with "pram body" legislation. The base width is now 34 cm at its narrowest point, ensuring the top frame hole meets the 28 cm width requirement while accommodating tapered sides and proper frame fitting when folded. These changes enhance Luna's safety, comfort, and functionality for a better user experience.



134 Dimension change

PRICE & PRODUCTION

PLASTIC BOTTOM



135 Plastic shell and bottom

Traditionally, carrycots have had plywood bottom plates, but Odder is working on switching to PP plastic (illu. 136). This change addresses the need to avoid chemicals for moisture and mold prevention and the rising cost of wood. A plastic bottom offers several advantages like greater design freedom for improved comfort and functionality, lighter weight for easier transport, and better resistance to moisture and mold, ensuring a healthier sleeping environment for the child. Overall, a plastic base represents a modern and functional choice that meets both the practical and aesthetic needs of parents and their children.



136 Plastic and plywood

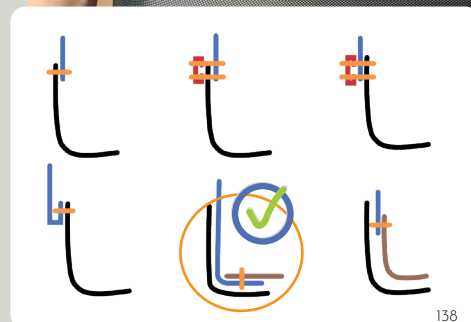
DESIGN AND SEWING OF TEXTILE ON PLASTIC

To attach the textile to the plastic shell, various models and products combining plastic and textile were investigated. A common practice is to sew the textile directly onto the plastic shell if its thickness allows. There are two main approaches being to sew the textile on the inside or outside of the shell, each with its own pros and cons regarding appearance and production. Additional considerations include using bias tape (illu. 137) for a cleaner finish and adding an inner plate or shell onto which the fabric can be sewn to avoid visible stitching. (app. 35)

To achieve the desired look and practical production, one end of the textile will be sewn on the outside of the plastic shell and folded over, while the other end will be sewn onto an extra inner plate, which already must be added to give a more even surface for the mattress in relation to the design of the carrycot's feet (illu. 138).



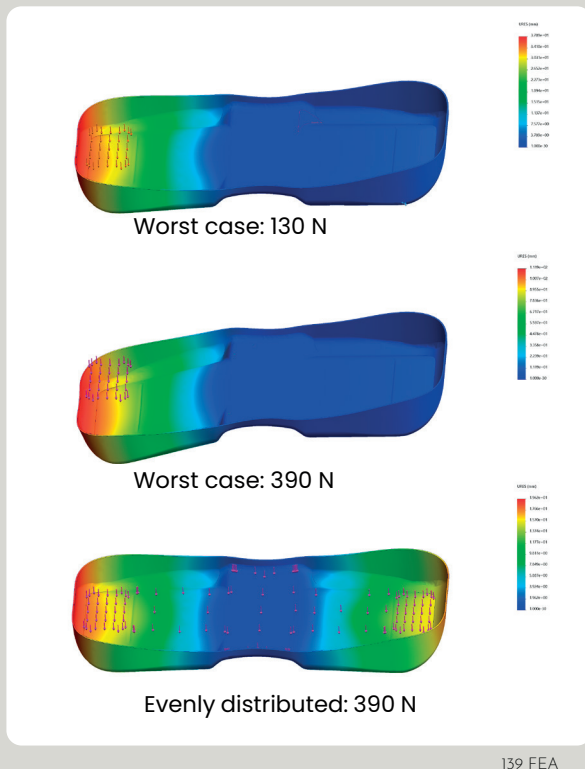
137



138

Orange = Stitching Brown = Bottom plate
 Blue = Textile Black = Shell Red = Bind

THICKNESS AND STRENGTH



MATERIAL OF BOTTOM SHELL

The plastic bottom shell for the carrycot is manufactured in PP Homopolymer, which is the most widely used mainstream grade and often used in packaging, textiles, healthcare, piping, automotive and electrical applications (Omnexus, 2024). This type of PP is therefore seen as a suitable choice of material for the bottom shell.

To ensure the carrycot's plastic bottom shell can handle expected loads, various strength analyses have been conducted (app. 36). Finite Element Analyses with different loading scenarios, including the weight of a large one-year-old boy of 13 kg as the worst case, with a safety factor of 3. The support was centered where the frame mounting bracket sits. The analysis included both evenly distributed loads and the worst-case scenario where the child is only at one end of the carrycot.

Results showed that with a material thickness of 3 mm the loads result in a deflection of 19.6 mm when the load with safety factor is evenly distributed. Furthermore, the shell deflects 37.9 mm without the safety factor and 111.9 mm with it, which exceeds acceptable limits in the worst-case scenario. These calculations are based solely on the plastic shell, not accounting for additional support from other carrycot components.

In actual use, forces will be distributed through the textile and into the steel frame, providing additional stiffness. An extra base plate also adds thickness and strength, which wasn't included in the analysis. These factors collectively enhance the carrycot's strength and stability, ensuring it meets safety standards and offers reliable use for parents.

PP HOMOPOLYMER FACT BOX

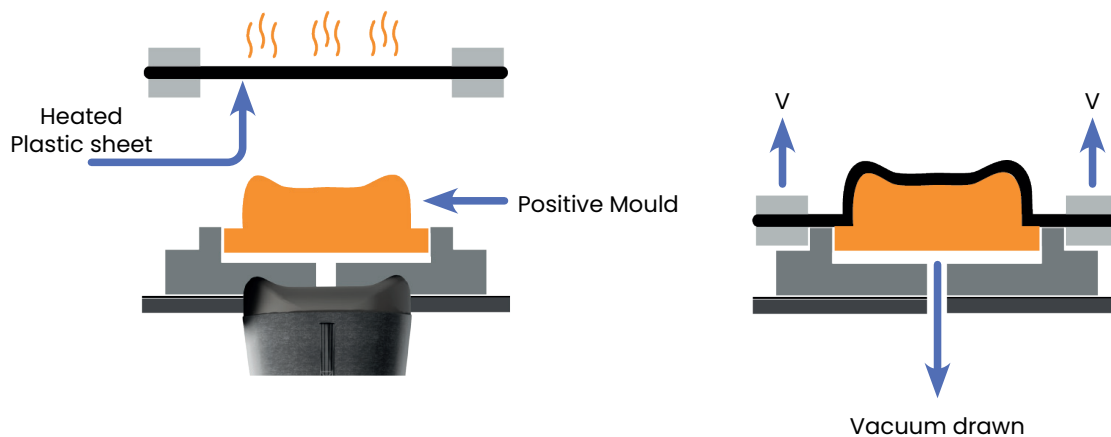
Advantage:

- High strength-to-weight ratio and stiffer and stronger than copolymer
- High chemical resistance and weldability
- Good machinability
- Impact resistant
- High stiffness
- High color fastness
- Reusable

Disadvantages:

- Poor resistance to UV and scratches
- Brittle below -20°C
- Risk of dimensional changes after casting due to crystallinity effects

However, polypropylene's performance is gradually optimized by improving its properties with the help of various additives.



140 LUNA bottom shell vacuum forming

PRODUCTION OF BOTTOM SHELL

The plastic bottom shell is produced using vacuum forming, a process known for high precision and uniformity in plastic parts. It involves heating a 3 mm PP sheet until it becomes soft, then placing it over a mold. Air is sucked out from between the sheet and mold, creating a vacuum that presses the plastic onto the mold, ensuring an exact shape. The sheet is then trimmed to remove excess material. (Dineen, 2019). There are several important points to be aware when vacuum forming (see fact box). The bottom shell has a rounded shape that extends up the sides of the carrycot, includes two indentations for locking bracing brackets, and four indentations that act as feet to keep the carrycot stable and avoid standing on the frame mount.

In addition to the bottom shell, a 1mm thick inner base plate must be produced for mounting the textile and providing a larger surface for the mattress. This plate is CNC milled to fit the bottom shell with two holes allowing the braces to be locked in their dent in the bottom shell.

The estimated unit price of the vacuum-formed bottom shell and the inner base plate will cost 260 DKK to produce (app. 37). Prices will vary based on raw material costs and production scale.

VACUUM FORMING

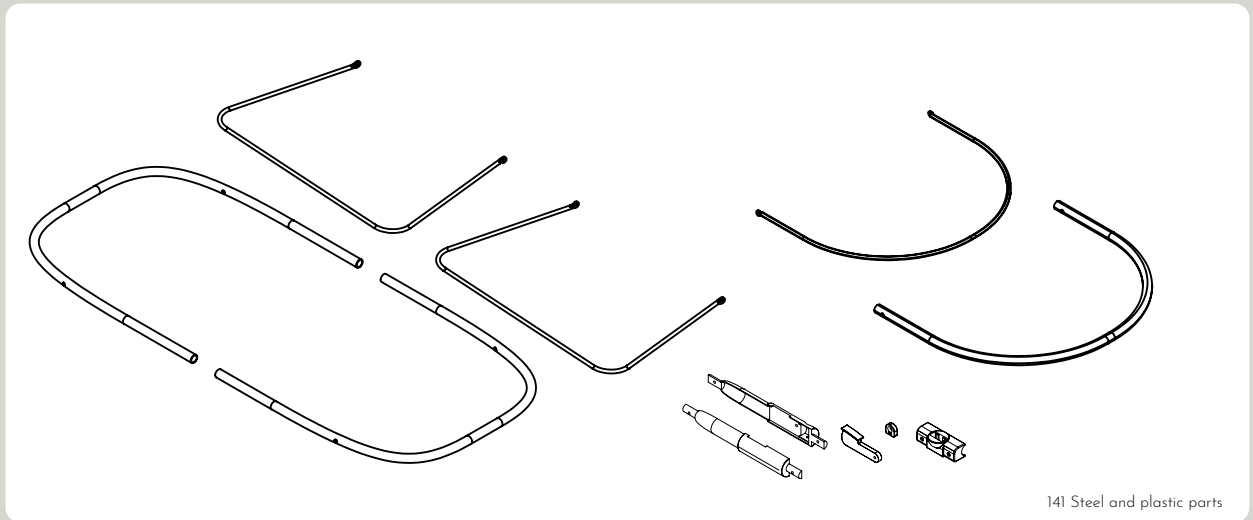
- **Material flow and webbing:** Sharp corners should be avoided to ensure an even distribution of the material and minimize the risk of webbing.
- **Draft/Taper:** Slip angles on vertical surfaces are necessary to ensure that the parts can be removed from the mold easily and without damage.
- **Draw Ratio/Required Material Thickness:** Draw ratio refers to the ratio between the height of the part and its footprint. The higher the part, the thinner the material must be to cover the entire part correctly.
- **Texture:** Texture can be added to the parts either by using material with applied texture or by using a

textured aluminum mold. It is important to consider how the texture will affect the forming process and the appearance of the part.

- **Pockets and ribs:** Any pockets or spaces between ribs must not be larger than their width and should ideally be 75% of the pocket's depth.
- **Ribs:** Ribs can be used to support a flat surface and can be created separately and attached to the original part afterwards.
- **Tolerances and accuracy:** It is important to allow as large tolerances as possible to reduce costs and speed up delivery times. Tolerances should be considered during the design process as they can vary depending on the material and design.

THE TOPFRAME OF THE CARRYCOT

PRODUCTION OF TOPFRAME - STEEL & PLASTIC PARTS



BENDED STEEL FRAME

The top frame, braces, and canopy braces in the carrycot are steel elements that need to be bent. The braces and one canopy brace are made of 5mm steel rods, each with bends with a fixed radius, while the second canopy brace uses 12 mm steel tube with a 1mm thickness and a fixed radius. The top frame consists of two 12 mm steel tubes, each with two bends but without a fixed radius, potentially requiring advanced bending techniques. After bending, the elements are cut to size, the ends of the braces are pressed flat and sanded and holes are drilled for mounting.

The price of the metal work depends on the complexity of shaping and drilling, with an estimated total cost for all steel items around 275 DKK (app. 37), subject to variations based on raw material prices and production scale.

PRICE ON TOPFRAME WITH PLASTIC PARTS

The production of special plastic parts for the carrycot includes handles with button components and plastic mountings for the canopy, produced through injection molded PP. This process involves heating plastic to a liquid state and injecting it into a mold, where it cools and solidifies into the desired part (see fact box)(HLH, 2024). The handle is molded in two halves, while the button components and canopy mount are single pieces.

Injection molding ensures precise and consistent parts but requires a high initial investment in molds after which production becomes fast and cost-effective for large quantities. For the canopy hinges, Odder Barnevognsfabrik's in-house designed ones are used, which are currently used on the Vida 2 pram as well. This canopy hinge has a unit price of 15 DKK (app. 15), which is used to estimate the cost of the handle to 15 DKK and 3.75 DKK for the canopy mount (app. 37).

INJECTION MOLDING

- **Draft/Taper:** Incorporate slip angles to facilitate easy release of the part from the mold.
- **Ribs and Gables:** Use ribs and gables for increased strength
- **Gate placement:** Plan the gate placement for efficient flow and minimal visual defects.
- **Avoid Sharp Corners:** Round the corners to reduce stress concentrations and improve flow.
- **Consider Shrinkage:** Consider the shrinkage properties of the material designed to ensure dimensional accuracy.
- **Efficiency and Speed:** Fast production once the mold is designed and manufactured.
- **High volume production capacity:** Can produce high number of parts with the same shape.
- **Initial Costs and Tools:** The initial costs of a mold can be high.
- **Design limitations:** Although injection molding allows complex designs, there are still limitations in terms of releasing the part from the mold.

TEXTILE

PRICE OF THE TEXTILE

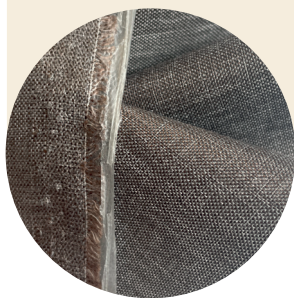


142 LUNA

Same textile & production progress



143 Odder Vida



144 Waterproof textile

The carrycot's outer textile, sourced from the same supplier used by Odder, is of premium quality, made from Oxford material with an integrated membrane for wind and waterproofing as well as breathability. This ensures that the child is kept dry and comfortable in various weather conditions. It consists of 50% recycled and 50% virgin material, offering exceptional durability (illu. 144). Rated at 6+ for weather resistance and color fastness on a scale of 1-10, the textile outperforms competitors, typically rated at 4. (app. 15)

CARRYCOT

The production of the textile components for the carrycot involves a process with several different elements (illu. 145).

- 1 - The sides are sewn in weather-resistant fabric on the outside
- 2 - Padding in the middle
- 3 - Nonwoven fabric on the inside to ensure durability and cost-effectiveness.
- 4 - Soft polyester fabric is used for inner lining

CANOPY

The canopy is made with casing for the canopy bracing and the weather-resistant textile on the outside and soft, breathable material on the inside. Fidlock magnetic buttons are attached to the inside of the windscreen (illu. 147).

APRON

The apron consists of the weather-resistant textile on both sides, with padding in the middle and a waterproof zipper in the middle for easy access to the child (illu. 146). The sides are sewn to the side fabric with a zipper for the inner lining underneath, where the top frame is to be placed. Magnets are integrated in the foot end for easy closing and Fidlock magnetic buttons in the head end on the windscreen to ensure a secure attachment to the canopy. In addition, a lining with padding for the foot and head end in soft and breathable material is required, which can be attached to the inside of the carrycot with a zipper.



145 Carrycot textile layering



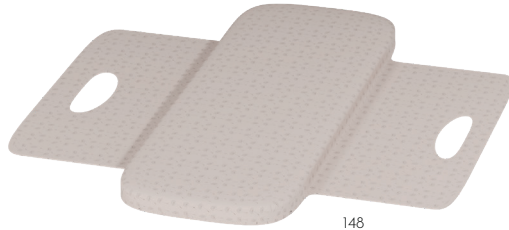
146 Apron with center zipper



147 Fidlock

THE INSERT

The insert is cut from a 4 mm felt sheet and sewn along its fold lines (illu 149). These seams break the strength of the sheet, which ensuring it will always bend at the weakest point. A cover with zipper is sewn to the felt sheet and mattress. Handles sewn on the cover for easy handling. Both the cover and the lining at the foot and head end are made of washable material for easy maintenance (illu. 150).



SHOULDER STRAP

The shoulder strap consists of two nylon straps, both of which have a piece of elastic in a sleeve that starts just above the attachment to the carrycot. One end attaches to the foot end of carrycot, while the other fastens to an adjustment buckle (illu. 151). The other part of the shoulder strap is attached to the head end and goes through the adjustment buckle, so that adjustment of the length is possible. The straps are sewn onto the side fabric, aligning with the top frame position, with excess strap left for attachment to the bottom plate. Additionally, a loose padding is sewn for increased comfort during use.



TEXTILE PRODUCTION COST

Production costs for the textile components make up a significant part of the total price of the carrycot, primarily due to sewing expenses, while zippers, magnets and buttons are also necessary expenses. However, efficient production methods are used, such as the use of edge bands, which lowers costs considerably (app. 15). The price of the sewing work depends on the complexity of the different fabric cuts and finish of the stitching, which has a great influence

on the time it will take to sew the components. Therefore, in a real scenario, a prototype would have to be made from the sewing room, from which the amount of material and time could be assessed. As this has not been possible, the production price for the textile components is assessed based on insights from Fie Elvira Storm (app. 15), where, after calculations, a total price of 1285.5 DKK is estimated for the textile elements for Luna (app. 37).

TOTAL PRICE

The calculated total production price for Luna is at 1767.5 DKK. This price is estimated from several different sources. Offers and price estimates have been obtained from various Danish manufacturers to get an accurate understanding of the costs, but this is for local production, which is not expected to be used in a real production of the carrycot. Additionally, online research has been carried out, which has provided insight into the standard costs for materials and production processes from various suppliers worldwide. Finally, Odder's experience and expertise has been utilized, which has provided an assessment of the expected production costs based on their existing production and market conditions. (app. 15 & 37)

Cost price 1,000 units	
Steel components	275 DKK
Plastic	
- Injected parts (handles etc.)	67,5 DKK
- Vaccum forming (bottom shell)	235 DKK
- Cnc milling (bottom plate+ shell)	25 DKK
Textile	
- Materials & components	321 DKK
- Sewing	964 DKK
Total cost (excl. vat)	1761,50 DKK

INTERNAL COMPONENTS

HANDLES

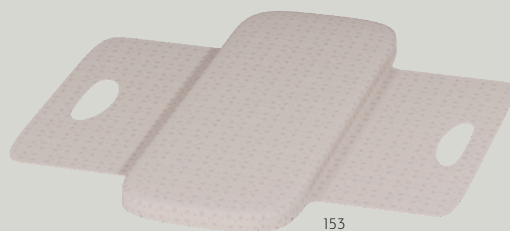
The handles feature leather on one half for enhanced grip and comfort. The Luna release button is placed on the upper side, requiring simultaneous pressing of both buttons to lift Luna off the frame, as per Danish Standard regulations (Dansk Standard, 2022).

CANOPY MOUNT

The canopy mount, placed on the side the top frame, is securely attached with a blind fastener. It facilitates easy attachment and removal of the canopy from the carrycot.

MADRESS INSERT

The felt insert provides a flexible but ridged base and sides for the mattress. A removable, washable cover with handles encases both the felt and mattress. Like Odder Barnevo-gnsfabrik's mattresses, the mattress used is made of pressure-relieving memory foam with tencel tm fiber that offers ergonomic support and antibacterial properties (BabySam, 2024c).



STANDART PARTS

BUTTONS AND MAGNETS

In addition to sewing along the sides, magnets and buttons are strategically placed to secure the apron snugly. Magnets keep the apron close to the foot end, ensuring easy access, while Fidlock magnetic buttons attach the windscreen to the canopy and ensure that the child is securely covered from the weather.

CENTER ZIPPER

The apron features Odder Barnevognsfabrik's patented centered zipper, which provides easy access to the child. The same type of YKK waterproof zipper is used here as is used today on the Odder Vida 2.

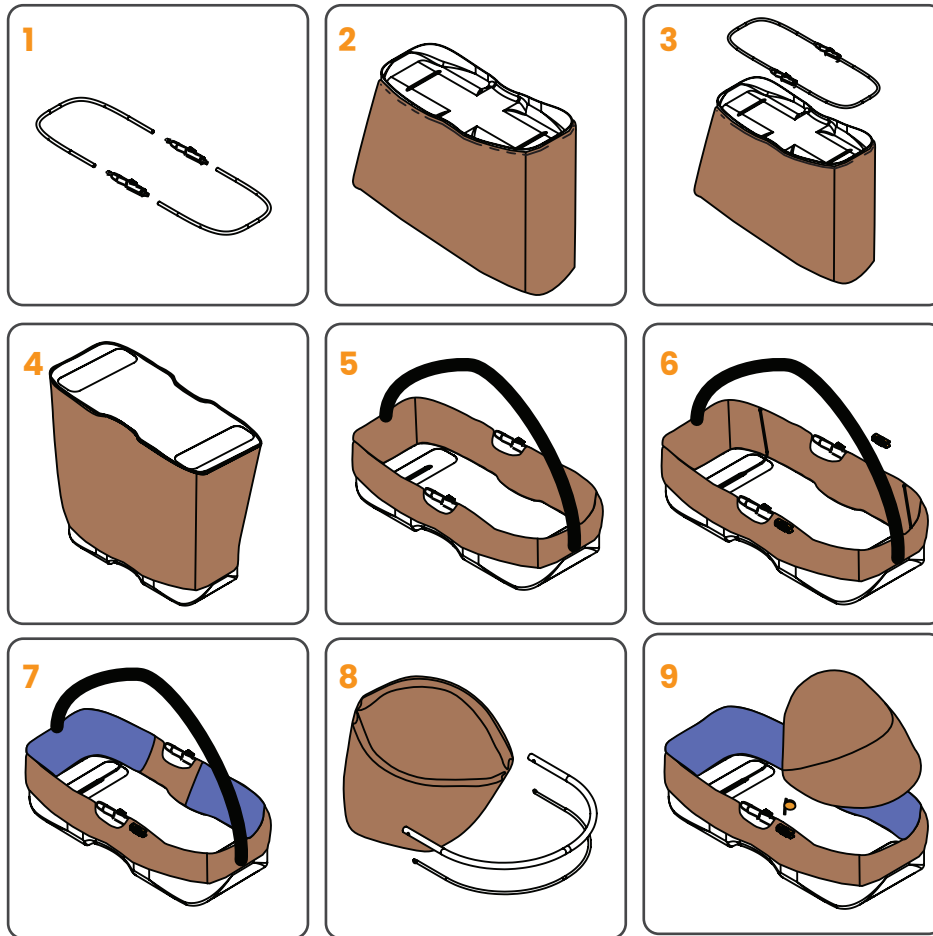
ADJUSTMENT CLIP

A metal adjustment buckle is incorporated into the shoulder strap design, allowing easy one-handed length adjustment while Luna is carried on the shoulder.

154

ASSEMBLY

The assembly sequence of finished components for Luna is described below.



1. The two top frame tubes are assembled with together with the handle with blind fastners

2. The textile with sewn-on front leather is sewn on the bottom shell ("downward facing")

3. The top frame is placed in the bottom shell

4. The textile is folded up over the top shell and sewn together with the shoulder strap on the underside of the bottom plate

5. The bottom plate is placed in the bottom shell with blind fasteners The end of the shoulder strap is secured in the same process

6. The bracing are screwed into the top frame
The canopy mounts are mounted on the top frame with blind fasteners

7. The extra inner lining is zipped inside

8. The canopy bracing are passed through the casing in the textile and assembled with blind fasteners

9. The canopy bracing is attached to the canopy hinge and clicked onto the "box"

WEIGHT ESTIMATION

Though the project the weight has been a concern due to the fact that the product has to be carried (illu. 155). Therefore, there has been a wish to keep the weight about 4.5 kg, the same as a traditional carrycot (Babysam, 2024c). The estimated total weight is a little less than 5 kg (app. 38), where the biggest factor is the plastic shell. The weight is within the acceptable limit due to it being moved to larger muscle groups carrying on the shoulder.

Bottom parts

Bottom shell: 1200 g
Bottom plate: 200 g

Top parts

Metal frame: 475 g
Textile: 920 g

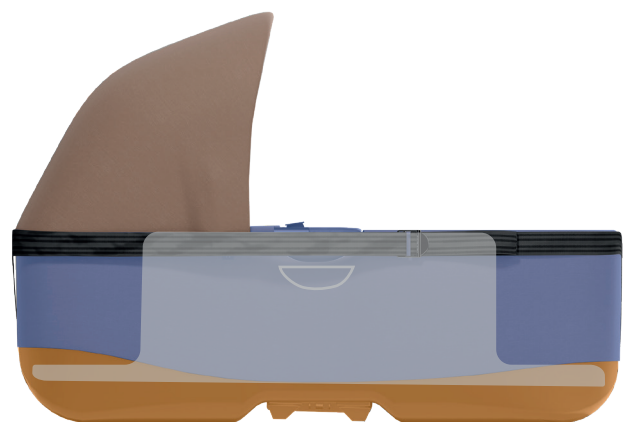
Canopy

Metal frame: 290 g
Textile: 300 g

Insert

Felt and cover: 400 g
Mattress: 400 g

The carrycot in total: 4.8 kg



= Canopy
 = Insert

= Top
 = Bottom

155 Weight estimation

SUPPLY CHAIN

Odder Barnevognsfabrik already has suppliers around the world, which will also be used for the production Luna. Therefore, the starting point is the countries that are currently used to producing various parts for their prams. (app. 15)

Turkey

Textile work,
Metal work,
Injecting molding,
Vacuum molding and
Sourcing of screws and pop rivets

China

Frame
Wheels

Retailers :

Babysam Denmark



DESIGN BREIF 7.0

Through in-depth user research, the team was able to concretize the wishes, worries and needs that new parents often face. Through this it was possible to map the daily routine and the use of the many new products targeted at the age group of 0–1-year-olds. The user data is held up against previous insights from market research and inputs from a health nurse.

With a basic knowledge of the market, the user group and the relevant product categories, the insights must be transformed into a sharper concept direction.



02 THE PRAM

- Very simple construction of the carrycot
- Increased product focus between 0–1 years
- Pram or combi pram: preference influenced by residential location
- The stroller is not designed to provide comfortable naps on everyday basis.
- It is not necessarily the child's comfort that always has the highest priority.

03 MARKET

- The recommendations regarding maintenance and storage do not match the users' behaviour.
- The features of the frame is the main selling point other than the carrycot size.
- Regional differences in which brands are most popular
- The biggest development in recent times is the combi prams
- The product developer worries about child's comfort, due to limited sleeping space and the risk of premature transition to a stroller.

04 Users

- The diaper bag has become an expert tool to the parent, resulting in the feeling of freedom and being well repaired.
- Avoid unnecessary baby equipment, to potentially reduce stress factors.
- Rigid for outdoor use, cozy for indoor comfort

05 TRANSITIONING

- Weather resistant materials in high quality, no matter the material.
- Nature colours.
- Few materials.



General

Minimum width and length

Length 80 cm

Weith 24 cm

1 SENARIO

- The baby needs to be carried lying flat
- The "new" carrycot should give the use free mobility for the legs when walking
- Padding on the strap to soften and distribute the weight.
- Minimum 30 cm space on the bottom plate
- Carrycot must be symmetrical
- Adjustment of the shoulder strap

2 SENARIO

- Canopy mounted on top of the frame
- Frame mount not interfering with the carriers body when lifted
- Two-factor interaction release



General

- The concept should combine the best features from both the pram and combi pram.
- Focussing on the babies need from 0–12 mth
- Rounded bottom plastic shell
- Using current Odder outdoor textile
- Have a simple outline and soft curves

1 SENARIO

- The carrycot is lifted with a center-based shoulder strap
- The arch in the bottom frame between 16–22 cm
- Keep the top more narrow than the bottom plate
- Minimum internal width of 28 cm at the top opening
- Be able to see the baby when walking
- The canopy should not be up when the carrycot is lifted
- Permanently mounted apron with center zipper
- Handles must be integrated in the top frame

2 SENARIO

- Utilize existing wire system
- Using the Odder Una 2 mount and frame
- Release button is integrated in the handles

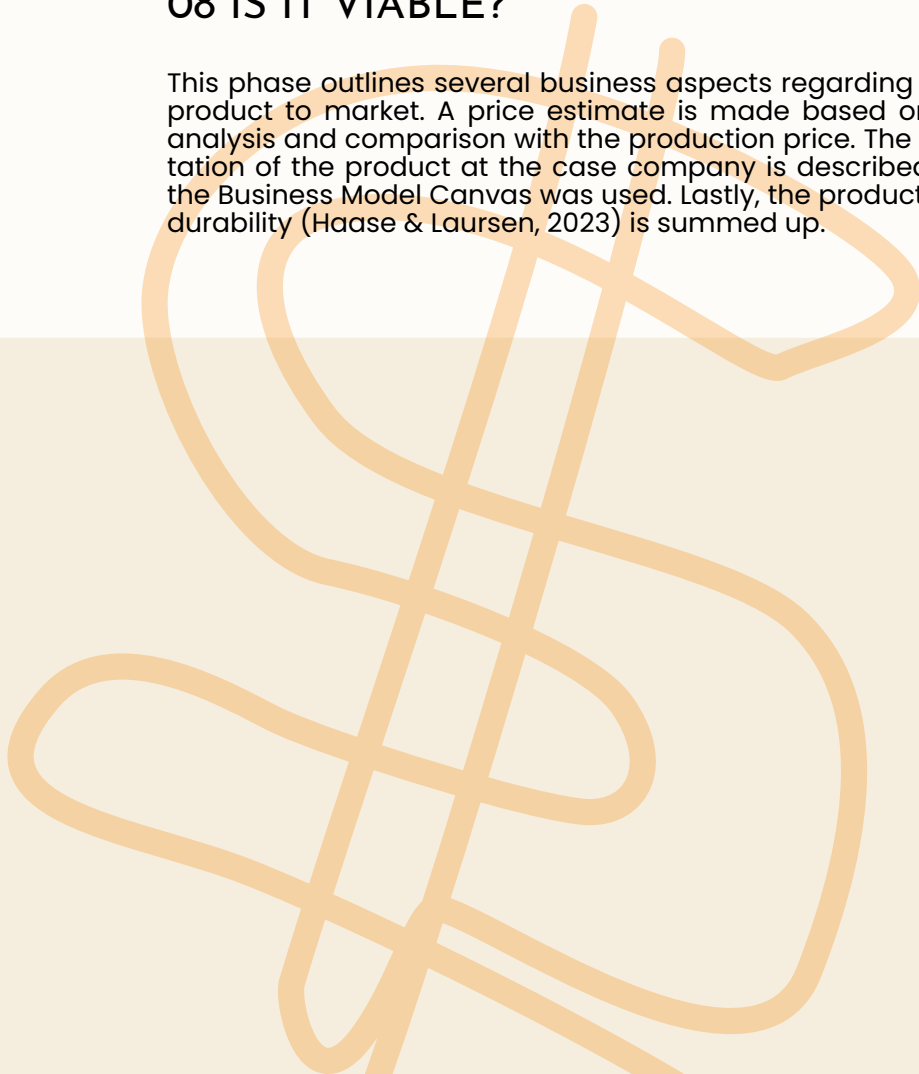
3 SENARIO

- Madress insert for essay and free space for preparing for the nap

BUSINESS

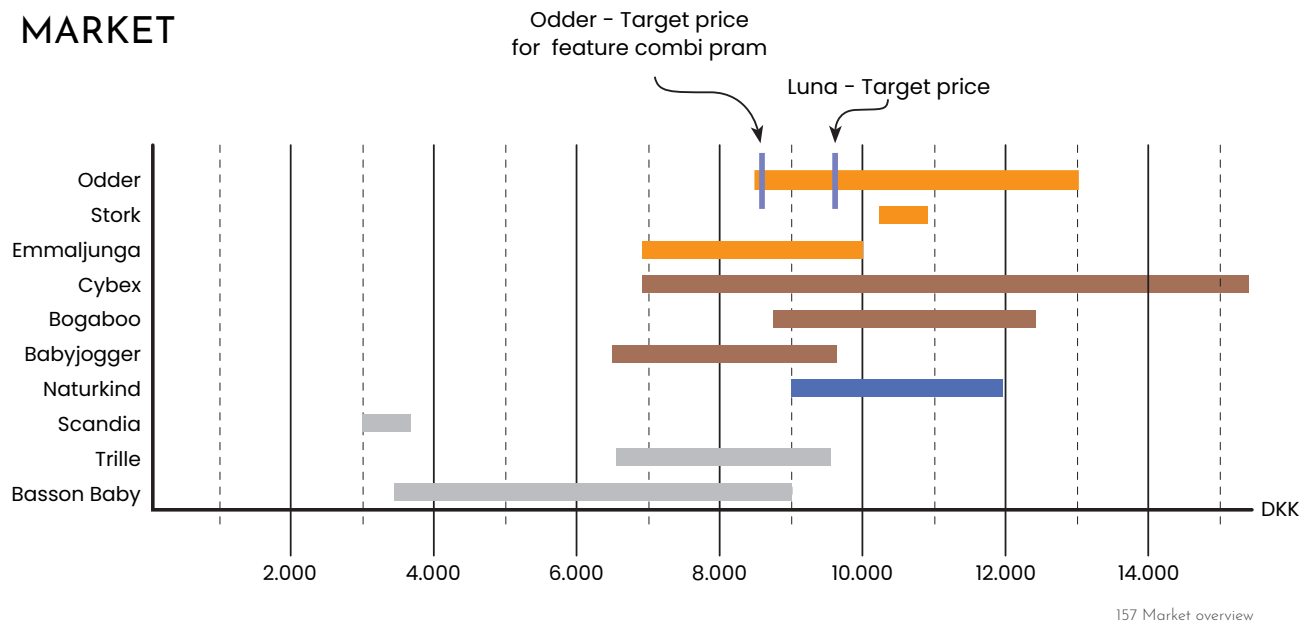
08 IS IT VIABLE?

This phase outlines several business aspects regarding getting the product to market. A price estimate is made based on a market analysis and comparison with the production price. The implementation of the product at the case company is described, for which the Business Model Canvas was used. Lastly, the product's strategic durability (Haase & Laursen, 2023) is summed up.



PRICE ESTIMATION

MARKET



An analysis of the price points of prams and combi prams from leading brands in the market has been carried out to compare with the existing market. The results show that the prices range from 3,499 DKK to 15,297 DKK (illu. 157)(app. 39).

A positioning in the mid- to high-end market segment seems sensible, as Luna is being introduced to the market under the Odder, with an expanded use scenario. Although consumers already buy products that solve similar functions separately, it is not certain that they are ready to integrate them into one product.

When it comes to the production price, the design involves both cheap and expensive production methods. The most complex process concerns the vacuum-formed plastic bottom shell, as these require new tools that Odder has not previously used, and the most expensive is the textile work as it requires manual sewing. Based on these considerations and a comparison with existing prams and combi prams, it is estimated that Luna will have an initial selling price of 9,500 DKK. However, it is difficult to set a price for the complete combi pram solution, as the frame and stroller seat have not yet been developed. However, in comparison, there is a wish from Odder that their combi pram, which is under development, enters the market with a target price in the region of DKK 8,500 (app. 11), which is not far from the estimated price of Luna.

PRODUCTION VS. MARKET PRICE

The estimated manufacturing price per unit is 1767.5 DKK. These estimates are based on a worst-case scenario, as the benefits of mass production are difficult to assess. Production costs will decrease as more units are produced. Odder will have to make some initial investments in the form of tools and molds for the production of the plastic parts. However, Odder already uses several of the materials and production methods, which reduces the initial investment costs.

When comparing the calculated production price for the carrycot itself of 1,767.5 DKK, and the estimated market price for a complete package with carrycot and frame is 9,500 DKK, the business case can be evaluated. It is known through insights from Odder that the total production price of their prams is divided roughly equally between the carrycot and the frame, and looking at the profit margin of a product, a rule of thumb is that the price doubles for each middleman involved before the final sale (app. 15). Therefore, it is also estimated that the calculated production price for Luna fits well with the estimated market price.

COST & VALUE LUNA COMBI PRAM

- + Frame can be used to at child from 0-5 years old
- + Can carry a baby 0-1 years within the carrycot
- + Easy to lift even when walking on stairs
- + Brand value (Odder)
- + Madres insert for cuddling before and after the nap
- The carrycot can only be used for the first year of the baby life
- Functional driven aesthetics

9.500 DKK

COST & VALUE "STANDARD COMBI PRAMS"

- + Frame can be used to at child from 0-5 years old
- + Compact packed
- + Easy to maneuver.
- + Brand value
- Short use of carrycot 0-6 mth
- No opportunities to carry a baby within the carrycot

6.500 - 15.000 DKK

IMPLEMENTATION

WHAT WOULD ODDER DO?

Odder would follow a low-risk strategy to test the market. They would start by producing a limited number of units which would be distributed to all BabySam stores. If the product proves to be positively received by the customer segment, they would consider starting mass production, which would also result in a lower unit price. This is also the approach they have when they have made limited edition anniversary products, where around 100 units are produced in the first batch. (app. 15).

When it comes to sales channels, Odder 's products are sold through BabySam, which is the exclusive retailer of their products. In the BabySam stores, Odder has its own section, where all their products are on display. As BabySam owns Odder, they are seen as the key partner, adding great visibility on BabySam's website, where they are highlighted in the brand spotlight section. Due to Odder's classic Danish design, their products are largely exclusive to the Danish market.

The introduction of Luna also opens new opportunities for Odder with its new value proposition. After a successful launch on the Danish market, there is potential to expand to the rest of Scandinavia or even Europe. In many European countries, there is a tendency to prefer prams with shorter laying measurements compared to Denmark, and combi prams and strollers dominate the market. This gives Odder the opportunity to reach new customer segments and customer relationships while expanding their market share with the launch of Luna.



158 Odder Barnevognsfabrik

IF IT'S NOT A PRODUCT FOR ODDER, THEN WHAT?

If Odder Barnevognsfabrik chooses not to include the new carrycot in their portfolio, there are still options for the future fate of Luna. The company is not obliged to continue the project and has rather functioned as a case company that has contributed knowledge and advice during the project. The collaboration began with a shared vision of innovating the prams of the future, but the project has evolved to focus on a more functional carrycot that could potentially fit other pram and stroller companies, such as Cybex or Bugaboo. For Cybex, Luna would fit into their Gold line in terms of function and aesthetics, and at Bugaboo it would belong to their 2-in-1 line. It would not be realistic to launch in such a mature market without a frame or stroller seat as an independent brand that consumers do not know and trust in terms of quality, design and safety.

This carrycot is unique and there are not many similar products on the market. However, Odder Barnevognsfabrik would have to carry out further market research to validate whether it is possible to change parents' perception of which products to buy and their behavior around the pram.



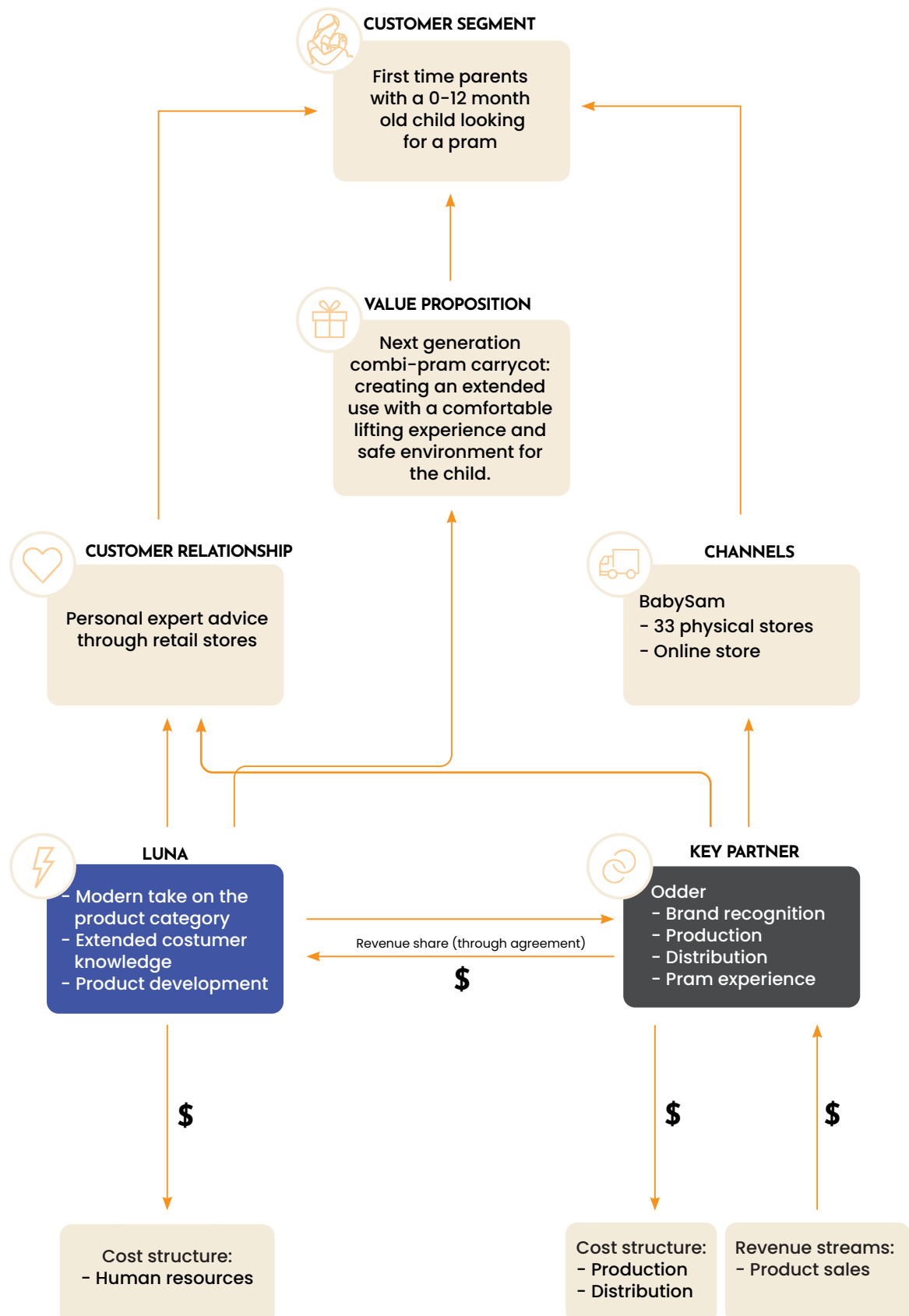
159 Bugaboo 2-in-1



160 Cybex gold

BUSINESS MODEL CANVAS

A business model for Luna is created using the Business Model Canvas (Osterwalder & Pigneur, 2010). The model is created from the assumption that a partnership with the Danish market leader, Babysam who is owning Odder, is established utilizing their key resources, sales channels etc.



STRATEGIC FIT

A PRODUCT FITTING THE USER, MARKET AND COMPANY

The creation of Luna has included several development phases with different strategies to achieve a strategic fit. The development has dealt with all three categories, striving to create a strong product-user-fit, a strong product-market-fit and a strong product-company-fit (Haase & Laursen, 2023). To understand how Luna handles the challenges and to understand to what extent the various strategies are being implemented, a summary is made.

PRODUCT USER FIT

Luna's entire foundation is based on the parents and their new needs as first-time parents. The Carrycot covers an extension of the product's use both in relation to the usage scenario but also the actual time the product can be used before the child outgrows it. Luna aim to be the primary nap product for children aged 0-1 years, and make parents less likely to buy many add-on products with a short period of use. A goal for Luna has been to create a strong product-user-fit in regard to the needs and behavior of both parents and children – but it difficult answer yet whether it will be a success or not.

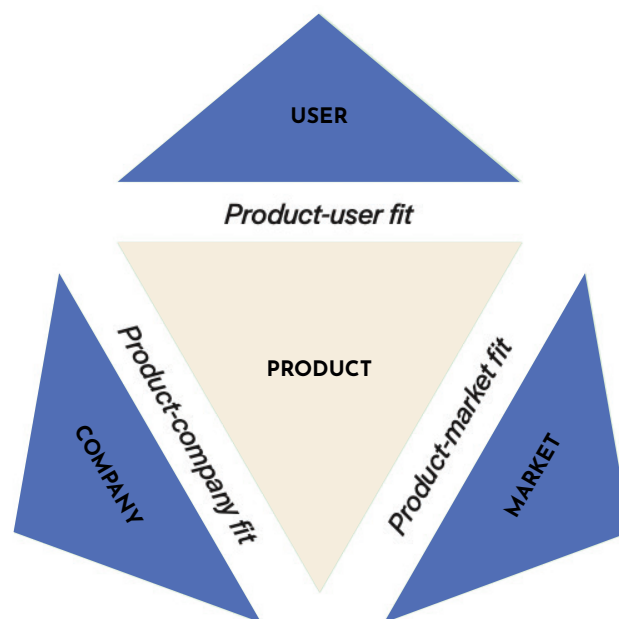
PRODUCT MARKET FIT

Luna is a new take on a carrycot and by analyzing the market it is clear that it brings something new and innovative to the otherwise red ocean market.

The design of the carrycot takes place in its unique interaction possibilities and usage scenarios, which aim to be competitive not only in the pram market but also in the baby lift market. This can help to give Odder Barnevognsfabrik the opportunity to enter other segments of an overall market in which they are already well known.

PRODUCT COMPANY FIT

It is risky and expensive to be first-movers in such a mature market as prams are in today. The development of Luna has to some extent focused on Odder Barnevognsfabrik's strategic strengths; classic expression and history, focus on comfort for both parents and children, high-quality materials, and safety. Product-user-fit and product-market-fit have been the main focus of the project. Therefore, there is a lack of product-company-fit by having designed a very forward-looking carrycot, which goes against Odder Barnevognsfabrik's very classic values. This therefore requires a product maturation that will make Luna fit their current product portfolio without compromising on the product's innovation.



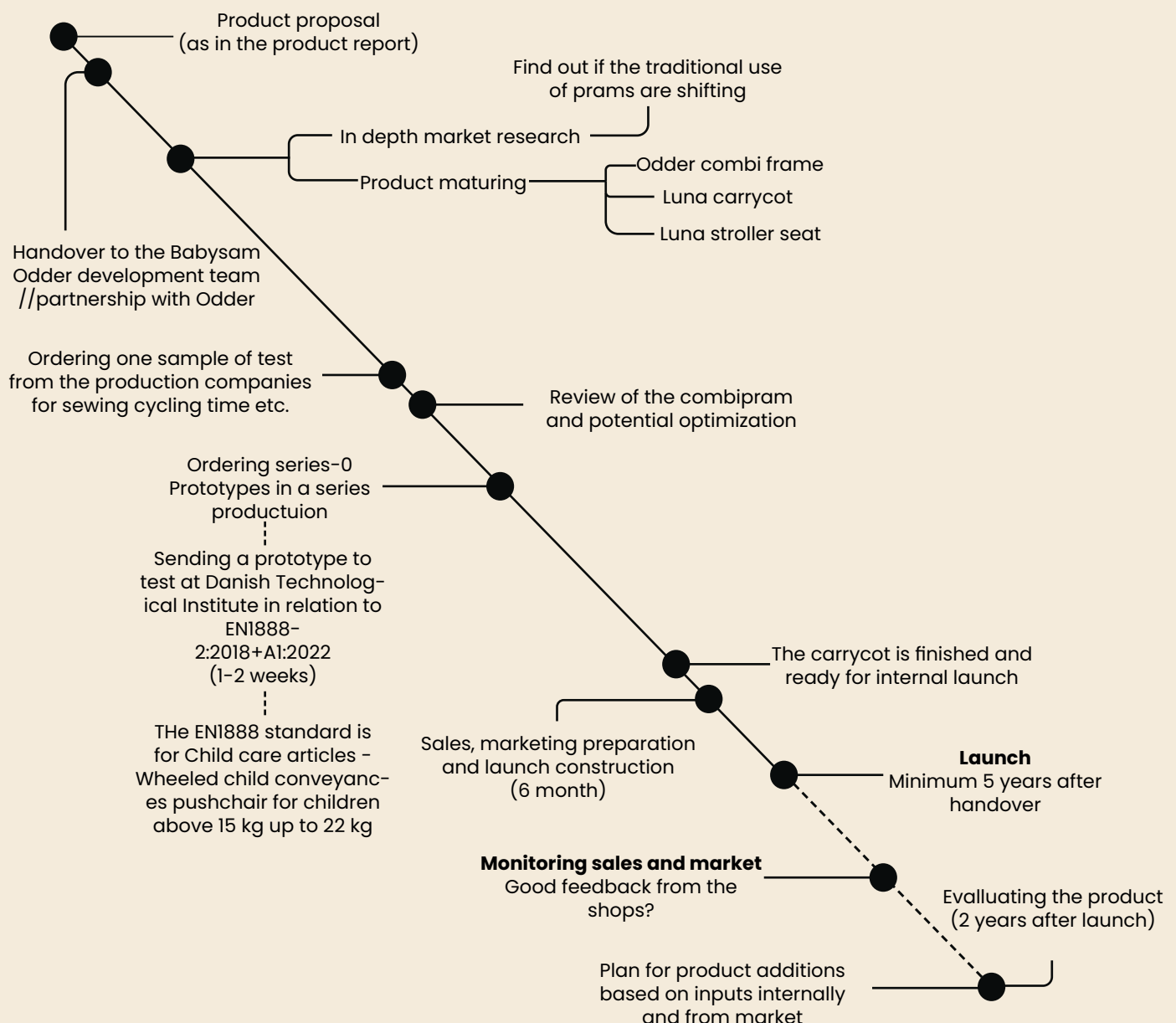
162 Strategic fit (Haase & Laursen, 2023)

ROADMAP TOWARDS IMPLEMENTATION

The below plan for market launch is supported by meetings with Fie Elvira Storm, Product Manager from Odder, who compared this project with their typical project with similar products (app. 15). In addition, it is based on the fact that there is a parallel need for the design and development of a pushchair seat and, most critically, a frame, which will also have an influence on Luna's design in relation to assembly. However, it is considered possible to start the implementation before the other products have been fully developed, as Luna is based

on well-known principles where possible interactions between the components may occur.

The plan is based on a collaboration with Odder, which is owned by BabySam – either with a joint partnership or sale of the product proposal.



EPILOGUE



CONCLUSION

This project started with grounds in making something everyone know what is: The Pram.

This starting point have led to an extensive knowledge about how first-time parents live, think, and behave. The numerous number of user surveys have made it possible to select and work with the transitioning from indoor to outdoor beforehand and after Babies' daytime naps. By developing a carrycot that appeals to both indoor and outdoor use, parents' daily routines can be simplified and the child's sleep quality increased.

Features such as easy folding, adjustable shoulder strap, ergonomic shaping, and materials suitable for both indoor and outdoor use have proven essential. This new take provides a more coherent and user-friendly solution that removes the need for several different add-on products and thereby re-establishes the product-user fit.

By combining knowledge from Odder and knowledge gathered from users, a new possibility arose for a product category that combines functions from existing ones. The comprehensive research showed a tendency towards a change in behavior in the Danish tradition that removes the need for regular full length prams. However, the proposed solution requires a certain change in consumer habits, in order to achieve success on the market. Further market research will therefore be necessary to convince consumers of the benefits of the new integrated solution.

Overall, this project offers a proposal for a new and improved approach to child transport that matches the needs of modern parents while maintaining Odder's high standards of quality and design.

REFLECTION

PRODUCT

FAR FROM A FINISHED COMBI SOLUTION

Luna is intended as the start of an innovative expansion of Odder's product portfolio, but in that context, it will be necessary to further develop a new frame for Luna and a stroller seat to get a complete combi pram. Here, work could be done to improve the ergonomics of stroller seats and meet the needs of children who outgrow combi pram carrycots before they are developmentally ready to sit in a stroller. Another relevant development aspect for the Luna family would be a balcony frame – a frame able to rock but without wheels that can be used stationary on balconies.

ALTERNATIV BUSINESS CASE

For a long period in the project where it was considered whether Luna should be sold as a stand-alone product. In this case, Luna's mounting bracket would have been made so that it could be mounted on different pram frames, which was especially with the second-hand market in mind. However, this would require consumers to buy an entire pram and discard the carrycot, which was not valued as a sustainable solution. Although the carrycot often "dies" first, consumers are likely to doubt the condition of the frame if the carrycot appears worn. This approach could lead to several carrycots with several years of good use being discarded in favor of Luna, which goes against the internal goal of making full use of the materials and resources.

PRODUCTION OF THE CARRYCOT

An important part of the product's design is the textile work. The design and construction of the textile components has not received the necessary attention in this project, as it is a core competency at Odder. Even for Odder, it is difficult to give an exact price and set limits on what is possible without first sewing a prototype. Textile is a "living" material that can fold or stretch far more than other materials, which complicates production methods considerably.

GRAY AREA IN LEGISLATION

Luna is designed with the future in mind and may therefore fall somewhat in a gray area between the current Danish standards. This is a challenge, but also an opportunity to push the boundaries of what is possible in pram design. Although simplified FEA analyzes have been performed, additional physical testing of the selected materials would be beneficial to ensure that the product can hold up to the usage scenarios for which it was designed. This would strengthen the product's robustness and reliability in daily use.

PROCESS

WHY ANOTHER PRAM?

A large part of the initial process was spent on finding a possible framework that was both "university" enough and fell within the area of interest. It was a particularly hard task to answer the question "why another pram?". simultaneously, interviews and insights confirmed the need for this project, especially considering that a typical baby uses more than 6 different sleeping products.

This project followed a different approach as it has been the case before, which led to an endless framing process. This was frustrating, as the process and approach could not simply be compared with, for example, B2B projects, which have access to more concrete statistics and problems. It became a challenge to draw undeniable conclusions when the necessary data were not available, giving a sense of having to start over every time something in the project was questioned.

A MATURE MARKET

Another big challenge was understanding what it means to work within a "mature" market. It proved difficult to design concepts that did not already exist. At one point, a so-called "Google ban" was necessary, as it only contributed to the impression that all original thoughts had already been thought. This hampered the creative process and made it challenging to come up with new and innovative solutions. In addition, a lot of time and energy was spent on identifying and discussing other projects and solutions, in order to get an understanding on what a master thesis was and to avoid building the project on a too thin foundation, which ended up being a significant time consumer.

THE VALUE OF IN-DEPTH USER RESEARCH

Essential points to take away from this process are the importance of user knowledge. It has been learned that although the market may seem saturated, there is still room for innovation when in-depth research is combined with user insights and design vision. The world and the people within changes everyday and so does their behavior and needs.

What a thesis?! Our heads have exploded a hundred times, but we are left with pride of bringing something new to a very old and mature market, which has given us some credit – fighting against tradition and a long line of other products. Now, it just needs some years of product maturing.

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All illustrations not included in the list are own production or images.

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- 10** Bogaboo Fox 5 - <https://www.babysam.dk/fox-5-complete-graphite-midnight-black-onesize>
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- 13** Najell Sleepcarrier - <https://www.babysam.dk/sleepcarrier-vol3-stormy-grey-onesize>
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- 17** - Collage consisting of:
17.1 - Car seat - <https://www.babysam.dk/cloud-t-i-size-sepia-black-onesize>
17.2 - Sofie Giraf - https://www.matas.dk/sophie-la-girafe-18-cm?utm_source=google&utm_medium=cpc&utm_campaign=&gad_source=1&gclid=CjwKCAjw9cCyBhBzEiwAJTUWNeAuA88Rzq03Bjb3Z-54KhIWdq9oO-nRHZO96HVLyLD4mYRjHIDORoCuj4QAvD_BwE
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17.5 - Neonate Baby monitor - <https://www.babysam.dk/n65-babyalarm-light-grey-onesize>
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17.9 Najell Sleepcarrier - <https://www.babysam.dk/sleepcarrier-vol3-stormy-grey-onesize>
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- 32** Collage consisting of:
32.1 - Cradle - <https://dk.pinterest.com/pin/715227984560060961/>
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48.2 - Ventilation canopy - <https://www.babysam.dk/fox-5-breezy-sun-canopy-v2-pine-green-onesize>
48.3 - Rain cover - <https://www.babysam.dk/regnslag-exclusive-small-onesize>
48.4 - Mattress - <https://www.babysam.dk/madras-inkl-topmadr-30x75-onesize>
48.5 - Mosquito net - <https://www.babysam.dk/insektnet-onesize-2>
48.6 - Harnes - <https://www.babysam.dk/barnevognssele-sort-onesize>
48.7 - Back support pillow - <https://www.babysam.dk/barnevognspude-croco-groen-onesize>
48.8 - Voksi Classic - <https://www.babysam.dk/classic+-black-flying-onesize>
48.9 - Odder lift - <https://www.babysam.dk/lift-black-onesize>
48.10 - Najell Sleepcarrier - <https://www.babysam.dk/sleepcarrier-vol3-stormy-grey-onesize>
48.11 - Organazer - <https://www.babysam.dk/organisere-outdoor-black-onesize-2>
48.12 - Handle gloves - <https://www.babysam.dk/oesterbro-handsker-brun-onesize>
48.13 - Phone holder - https://www temu.com/3-in-1-baby-stroller-s.html?is_back=1
48.14 - Sibling board - <https://www.babysam.dk/priam-staabraet-onesize>
48.15 - Stroller straps - <https://www.houseofkids.dk/klapvognsstropper-873448.html>
48.16 - Cup holder - <https://www.babysam.dk/odder-kopholder-onesize>
- 52** Product-market mismatch - Haase, L. M. & Laursen, L. N., 2023, Designing for Longevity: Expert Strategies for Creating Long-Lasting Products, Routledge
- 53** Product-company mismatch - Haase, L. M. & Laursen, L. N., 2023, Designing for Longevity: Expert Strategies for Creating Long-Lasting Products, Routledge

54 Odder Una 2 - <https://bbaby.dk/odder-una-2-0-duovogn-moerkegroen/>

55 Quality Domain - Parasuraman, A., Zeithaml, A., & Berry, L. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research. The Journal of Marketing.

57 - Collage consisting of:

57.1 - Teddy bear - <https://baeklunddesign.dk/produkter/56-bamser--kaniner-med-navn/14418-bamse-fra-tiamo-70-cm/>
57.2 - Diapers - <https://www.coolpriser.dk/shop/smoby-baby-sygeplejer-ske-1998302p.html>
57.3 - Toys - <https://www.dba.dk/lamaze-aktivitetslegetoej/id-111416119/>
57.4 - Nappkins - <https://politiken.dk/danmark/forbrug/art688902/Stor-forskel-pa-blodhed-og-pris>
57.5 - Baby bib - <https://www.thermalbootssales.com/pippi-baby-pippi-savlesmaek-spids-5-pak-indian-tan/>
57.6 - Cloth - <https://lulusbaby.dk/products/thats-mine-stofbleer-3-pak-beige-brown-golden-mist>
57.7 - D- Vitamins - <https://ugleapote.dk/produkt/apovit-d-draaber/>
57.8 - Wet wipes - <https://www.biltema.dk/hjem/kropspleje/hygiejneprodukter/vadservietter-aloe-vera-48-stk-2000047918>
57.9 - Pacifier - <https://super-carla.dk/en/sutter/2267-bibs-pacifier-s-1-natural-latex-choose-color.html>
57.10 - Garbage bag - <https://tinybutik.dk/minior-blepose-ske-50-stk/>
57.11 - Lanolin balm - <https://www.matas.dk/momkind-lanolin-balm-50-ml>
57.12 - Water bottle - <https://gemakker.dk/products/drikkeflaske-500-ml-creme-beige-ayaida>
57.13 - Baby clothes - <https://forstadsmor.dk/2020/03/06/nyfoedt-baby-hvor-meget-toej-har-baby-brug-for/>
57.14 - Hand sanitizer - <https://fernonorden.dk/produkter/medicinsk-udstyr/ovrigt-forbrugsudstyr/saltvandsoploesning-nacl-0-9-flaske-30-ml-20-stk>
57.15 - Pacifier strap - <https://babybroderi.dk/products/bibs-sutteholder-sand-ivory?variant=47047208796492>
57.16 - Granola bar - <https://nordicexpatshop.com/DKK/karen-volf-muesli-bar>
57.17 - Baby alarm - <https://www.jollyroom.dk/babyudstyr/sikkerhed/babyalarmer/neonate-bc-5800d-ekstra-enhed-til-babyalarm>
57.18 - Saline solution - <https://fernonorden.dk/produkter/medicinsk-udstyr/ovrigt-forbrugsudstyr/saltvandsoploesning-nacl-0-9-flaske-30-ml-20-stk>
57.19 - Baby powder - <https://www.matas.dk/matas-striber-baby-salve-100-ml>
57.20 - Baby wrap - <https://www.dba.dk/vikle-moonboon-straekvikle/id-1113469467/>
57.21 - Diaper Changing mat - <https://kongessloejd.dk/products/all-you-need-mini-changing-pad-bags-navy>
57.22 - Nursing pads - <https://momkind.dk/products/genanvendelige-ammeindlaeg-6-stk>
57.23 - Blanket - <https://dk.pinterest.com/pin/797489046533154148/>
57.24 - Breast milk substitute - <https://parfume.dk/produkt/modermaelk-serstatning-nan-pro-1-drikkeklar/>
57.25 - Porridge - <https://taenk.dk/test/babymos/salling-oeko-mini-groed-aeble-banan-hindbaer-jordbaer-og-havre>
57.26 - Baby water bottle - <https://www.walmart.com/c/kp/nursery-water-bottle>
57.27 - Silicone bib - <https://lulusbaby.dk/products/bibs-silikone-hag-esmaek-earth>
57.28 - Baby bottle - <https://byhappyme.com/dk/sutteflasker/2534-mam-easy-start-anti-colic-ivory-str-260-ml-7392855121133.html>

60 Overview consisting of:

60.1 - Restaurant - <https://spiseliv.dk/artikel/5-gode-franske-restaurant-er-i-koebenhavn>
60.2 - Grocery shopping - <https://fodevarewatch.dk/Detail/artikel2599870.ece>
60.3 - Shopping - <https://ejendomswatch.dk/Ejendomsnyt/artikel5365440.ece>
60.4 - Visit friends - <https://planetofhotels.com/en/denmark/copenhagen/balcony-apt-copenhagen-city-center-50m-metro>
60.5 - Birthday - <https://www.valdemarsro.dk/smaa-foedselsdagsglimt/>
60.6 - Forrest trip - <https://badut.typepad.com/a/6a0105357b8c7f-970b019aff869382970d-popup>
60.7 - Attraction - <https://aktiviteterforborn.dk/oplevelser-for-born-zool-ogisk-have-koebenhavn/>
60.8 - Training with babies - <https://www.quora.com/unanswered/How-my-workout-plan-if-i-want-to-lose-weight-but-gain-muscle>
60.9 - Maternity group - <https://doodlemor.dk/bad-moms-fra-moedre-gruppe-til-mormafia/>
60.10 - Daycare back and forth - <https://www.dr.dk/nyheder/indland/fem-paedagoger-smittet-med-coronavirus-i-daginstitution>
60.11 - Doctor appointments - <https://www.dk-sundhed.dk/artikel/6-byerne-vil-nytænke-sundhedsvaesenet>

60.12 - Baby swimming - <https://oplevelskansen.dk/babysvoemning.aspx>
60.13 - Baby activity - <https://aof.dk/motion-og-bevaegelse/babygym-nastik?departments=AOF%20Sydvest%20Sjælland,AOF%20Østsjælland&page=1>
Illu 62. - Sleeping child - <https://membangtustore.com/blogs/gode-raad-om-sovn/sundhedsplejersken-sadan-far-du-en-god-start-med-slyngevuggen>

65 Collage consisting of:

65.1 - Bedside - <https://decokids.cl/producto/cuna-cozee-roble-grafito/>
65.2 - Baby nest - <https://www.kids-world.dk/filibabba-babynest-chest-nut-p-280995.html>
65.3 - Voksi Classic - <https://www.babysam.dk/classic+-black-flying-onesize>
65.4 - Najell Sleepcarrier - <https://www.babysam.dk/sleepcarrier-vol3-stormy-grey-onesize>
65.5 - Odder lift - <https://www.babysam.dk/lift-black-onesize>
65.6 - Odder Vida 2 - <https://www.babysam.dk/odder-vida-2-black>
65.7 - Baby hammock - <https://www.babysam.dk/slyngevugge-natur-med-leelo-vuggemotor-vuggestativ>
65.8 - Baby wrap - <https://www.dba.dk/vikle-moonboon-straekvikle/id-1113469467/>
Illu. 66 - Collage consisting of:
66.1 - Hawk - <https://www.pikist.com/free-photo-vrrpz>
66.2 - Contact lens - <https://woman.dk/liivsstil/her-er-5-fejl-du-garant-eret-ogsaa-begaar-med-dine-kontaktlinser>
66.3 - Tampon - <https://www.alt.dk/sundhed/lov-om-gratis-bind-og-tamponer-i-skotland-er-traadt-i-kraft>
66.4 - kangaroo - <https://www.csmonitor.com/Science/2010/0727/Marsupials-originated-in-South-America-study-suggests>
66.5 - Duvet - <https://www.sejsdyner.dk/guide-til-dyde>
66.6 - Bike helmet - <https://gioventu.dk/products/wasabi-cykelhjelm-kask-mat-sort>
66.7 - Mattress - <https://dk.tempur.com/blog/Home.html>
66.8 - Pillow - <https://dk.tempur.com/hovedpuder/>
66.9 - Sofa - <https://www.boshop.dk/sake-stofssofa.html>

68 Collage consisting of:

68.1 - Bedside - <https://decokids.cl/producto/cuna-cozee-roble-grafito/>
68.2 - Cot - <https://flexaworld.com/da-dk/collections/beds/products/baby-cot-white-clear-lacquer>
68.3 - Travel bed - <https://www.babysam.dk/dream1-rejseseng-onesize>
68.4 - Car seat - <https://www.babysam.dk/cloud-t-i-size-sepia-black-onesize>
68.5 - Odder Vida 2 - <https://www.babysam.dk/odder-vida-2-black>
68.6 - Baby Jogger City Elite 2 - <https://www.babysam.dk/city-elite-2-opulent-black-onesize>
68.7 - Najell Sleepcarrier - <https://www.babysam.dk/sleepcarrier-vol3-stormy-grey-onesize>
68.8 - Voksi Classic - <https://www.babysam.dk/classic+-black-flying-onesize>
68.9 - Odder lift - <https://www.babysam.dk/lift-black-onesize>
68.10 - Babycarrier - <https://shop.artipoppe.com/zeitgeist-baby-carrier/991-zeitgeist-bolivar>
68.11 - Baby nest - <https://www.kids-world.dk/filibabba-babynest-chest-nut-p-280995.html>
68.12 - Baby wrap - <https://www.dba.dk/vikle-moonboon-straekvikle/id-1113469467/>

85 Collage consisting of:

85.1 - Playstation 5 controller - <https://www.computersalg.dk/i/7387303/sony-dualsense-gamepad-trådløs-bluetooth-for-sony-playstation-5-midnight-black>
85.2 - Lounge chair - <https://danishliving.dk/bamsestolen-find-alt-om-designerstolen-her/>
85.3 - Desk lamp - <https://www.lampeguru.dk/nielsen-light-jensen-arkitektlampe-groen-229947>
85.4 - B&O A9 - <https://bcopenhagen.dk/en/beosound-a9-5th-generation/>
85.5 - Dining chair - <https://olssonmobler.dk/vare/primum-armstol-fast/>
85.6 - Glass vase - <https://dk.lenebjerrre.com/products/dorinia-vase-h20-cm-mint>
85.7 - Treadmill - <https://fitnessshoppen.dk/shop/top-sport-tm750s-62826p.html>
85.8 - Slippers - <https://satana.dk/vare/hjemmesko-sutsko-slippers/>
85.9 - Sage coffee machine - <https://www.sageappliances.com/dk/da/products/espresso/bes878.html>
85.10 - Robot vacuum cleaner - <https://greenride.dk/el-koeretoer/robotstoevsuger/roborock-s8-hvid/>
85.11 - SMEG - <https://www.smeg.com/dk/produkter/FAB28LOR5>
85.12 - Piano - <https://piano.dk/kawai-gl-10/>
Illu. 86 - Collage consisting of:
86.1 - Garden hose - <https://www.privatgrossisten.dk/shop/vandings-saet-fra-fiskars-30028p.html>

86.2 – Grill – <https://www.xl-byg.dk/produkt/weber-master-touch-premium-gbs-e-5770-oe-57-cm-kulgrill-sort-1995034>
 86.3 – Bonfire – <https://www.davidsen.dk/bon-fire-basis-baalsaet-med-baalfad-gryde-og-bbq-pande-c-id2000007-p-62509129312>
 86.4 – Sunbed – <https://cdon.dk/indretning-og-mobler/vidaxl-fold-bar-liggestol-plastik-antracitgra-p54901926>
 86.5 – Cafe table – <https://fildefercph.com/moebler/cafebord-4/>
 86.6 – Hiking boots – <https://www.outnorth.com/dk/varemaerker/salomon/men-s-quest-4-gore-tex-101379-FS155098>
 86.7 – Parasol – <https://www.dba.dk/parasol-carlsberg-4-stk-a/id-1110388436/>
 86.8 – Bench – <https://www.brdr-friis.dk/drachmann-have-baenk-120-teak-skagerak.html>
 86.9 – Wheelbarrow – <https://dkfliser.dk/shop/108-redskaber--vaerktoej/919-trilleboer-galvaniseret-100-ltr/>
 86.10 – Bike – <https://www.elcykeldk.com/norden-ellen-28-nexus-7-speed-sort-m-brunt-udstyr-56cm/>

87 Collage consisting of:

87.1 – Sheepskin – User picture
 87.2 – Birkenstock – <https://www.outnorth.com/dk/varemaerker/birkenstock/unisex-arizona-birko-flor-regular-117075-FS394976>
 87.3 – Gitar – <https://www.facebook.com/photo/?fbid=665872272228038&set=pb.100064158120254.-2207520000>
 87.4 – Water bottle – <https://udvalgtebog.com/udsalg/drikkevarer-trail-tumbler-trail-tumbler-580ml-4/>
 87.5 – Light chain – <https://www.ikea.com/dk/da/p/ledljus-led-lyskaede-med-64-paerer-udendørs-sort-80357430/>
 87.6 – Garden chair – <https://sika-design.dk/products/charlot-exterior-havestol>
 87.7 – B&O A1 – <https://www.magasinet.dk/beosound-a1-2nd-gen-blue-tooth-hoejttaler/AEPR02.html>
 87.8 – Apple Airpods – <https://www.apple.com/dk/shop/product/MV7N2DN/A/airpods-med-opladningsetui>
 87.9 – Sackit lounge chair – <https://sackit.dk/products/cobana-lounge-chair>
 Illu. 89 – Collage consisting of:
 89.1 – Yellow duffel bag – <https://editorialist.com/p/landon-medium-water-resistant-carryall-bag-in-ochre-velvet-puff-at-nordstrom-dagne-dover/>
 89.2 – Green duffel bag, short handle – <https://dk.pinterest.com/pin/522839837994562282/>
 89.3 – Green duffel bag, long handle – <https://in.pinterest.com/pin/603341681322959461/>
 89.4 – Beige backpack – <https://dk.pinterest.com/pin/464222674105825514/>
 89.5 – Sling bag – <https://www.maharishistore.com/products/9638-monk-sling-bag-cotton-nylon-ripestop-orange>
 89.6 – Crossbody bag – <https://dk.pinterest.com/pin/399553798209491913/>
 89.7 – Bum bag – <https://bikepacking.com/gear/make-your-own-fanny-pack/>
 89.8 – Yellow backpack – https://www.sohu.com/a/398123348_661854

111 Elastic dog leash – <https://www.amazon.com/Elastic-Coupler-Walking-Splitter-Supplies/dp/B099VZR82Q>

120 Odder Una 2 – <https://bbaby.dk/odder-una-2-0-duovogn-moerkegroen/>

121 Odder Una 2 – <https://erhvervplus.dk/oestjylland/ude-godt-men-hjemme-bedst-for-fire-aar-siden-droemte-odder-barnevognsfabrik-om-eksport-men-i-dag-er-det-fortsat-hjemmemarkedet-der-driver-forretningen>

123 Odder Una 2, frame – <https://bbaby.dk/odder-una-2-0-duovogn-moerkegroen/>

125 Collage consisting of:

125.1 – Playstation 5 controller – <https://www.ebay.com/itm/194472754519>
 125.2 – Playstation 5 controller, shape – <https://www.apple.com/dk/shop/product/HPNG2B/A/tr%C3%A5dl%C3%B8s-sony-playstation-dual-sense%E2%84%A2-controller>
 125.3 – Odder Una 2, carrycot – <https://bbaby.dk/odder-una-2-0-duovogn-moerkegroen/>
 125.4 – Watering can – <https://cheaps.factorystore2024.ru/content?c=10+I+vandkande&id=21>
 125.5 – Babyjogger combi pram – <https://www.kids-world.dk/baby-jogger-klapvogn-city-sights-dark-slate-p-287168.html>
 125.6 – TV remote in sofa – <https://www.istockphoto.com/photo/remote-controller-placed-on-a-couch-gm480552442-68799593>
 125.7 – Odder Vida 2 frame – https://www.babysam.dk/odder-vida-2-black?utm_source=partnerads&utm_campaign=26061

131 Odder workshop – <https://erhvervplus.dk/oestjylland/ude-godt-men-hjemme-bedst-for-fire-aar-siden-droemte-odder-barnevognsfabrik-om-eksport-men-i-dag-er-det-fortsat-hjemmemarkedet-der-driver-forretningen>

132 Dansk Standard. (2022). DS/EN 1888-1:2018+A1:2022 Child care articles – Wheeled child conveyances – Part 1: Push-chairs and prams. (p. 14)

142 Odder Vida 2 – <https://www.babysam.dk/odder-vida-2-black>

149 Voksi Carry me, felt – <https://www.voksi.com/da/carry-me>

151 Collage consisting of:

151.1 – Elastic with nylon sleeve – <http://m.doublecubefitness.com/pid18207504/Resistance-Band-with-Heavy-Duty-Protective-Nylon-Sleeves-Anti-Snap-for-Fitness.htm>
 151.2 – Adjustment buckle – https://www.lovelyjubblyfabrics.co.uk/our-shop/prod_8072687-By-Annie-1-inch-Ladder-Lock-Slider-Strap-Adjuster-Buckle-Black-Metal-2-Pack.html

156 World map – <https://pixabay.com/da/vectors/kort-globus-verden-verdenskort-7442006/>

159 Bugaboo 2-in-1 – <https://www.bugaboo.com/ca-en/bugaboo-fox-5-ultimate-all-terrain-stroller/>

160 Cybex gold line – <https://www.cybex-online.com/en/us>

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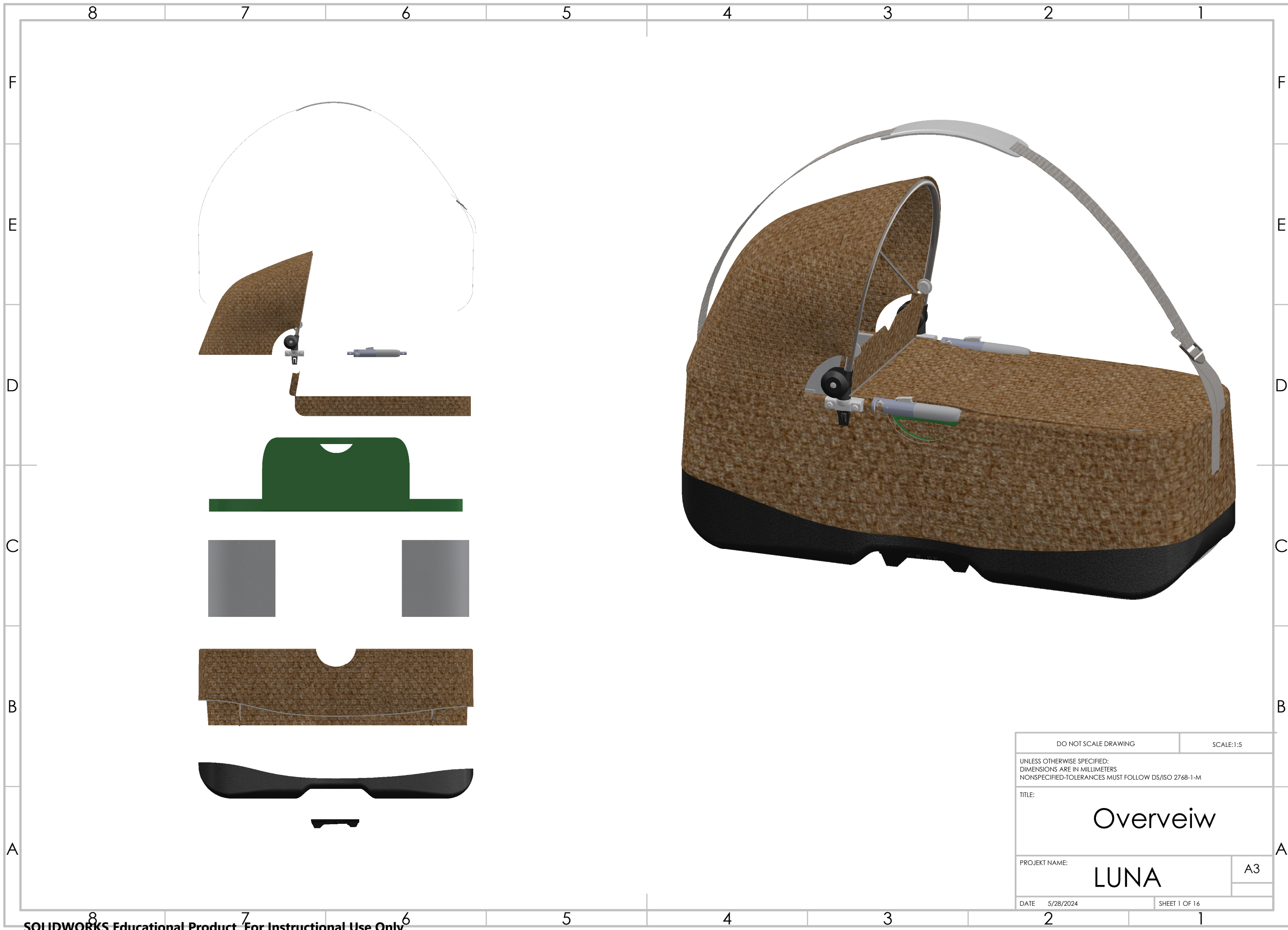
- App. 1** User visit – Christina & Nikolaj
- App. 2** interview with Health nurse
- App. 3** User visit – Anne & Jakob 1
- App. 4** User visit – Ditte
- App. 5** SMS answers
- App. 6** Odder interview 1
- App. 7** User visit – Mathilde & Tobias
- App. 8** Trip around the city
- App. 9** User pram models
- App. 10** BabySam visit
- App. 11** Odder interview 2
- App. 12** Sales numbers
- App. 13** Sale staff interviews
- App. 14** Odder interview 3
- App. 15** Odder interview 4
- App. 16** User visit – Anne & Jakob 3
- App. 17** Survey
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- App. 19** User visit – Anne & Jakob 2
- App. 20** Mock-ups in paper, cardboard and foam
- App. 21** BabySam interaction tests
- App. 22** Soft/ rigid analyze
- App. 23** Indoor/outdoor analyze
- App. 24** Lifting tests
- App. 25** Wrap around body
- App. 26** Hand inside frame
- App. 27** Narrow doors
- App. 28** Canopy integration
- App. 29** Apron development
- App. 30** Pop-up function
- App. 31** Shoulder strap adjustment
- App. 32** Center of mass
- App. 33** Mattress insert
- App. 34** Release handles
- App. 35** Attachment of fabric to plastic
- App. 36** FEA analysis
- App. 37** Production price
- App. 38** Weight estimation
- App. 39** Sales price estimation

AMALIE KONDRUP MADSEN
CHRISTIAN NYLANDER ØROM
LASSE BLUMENSAAT REASMUSSEN

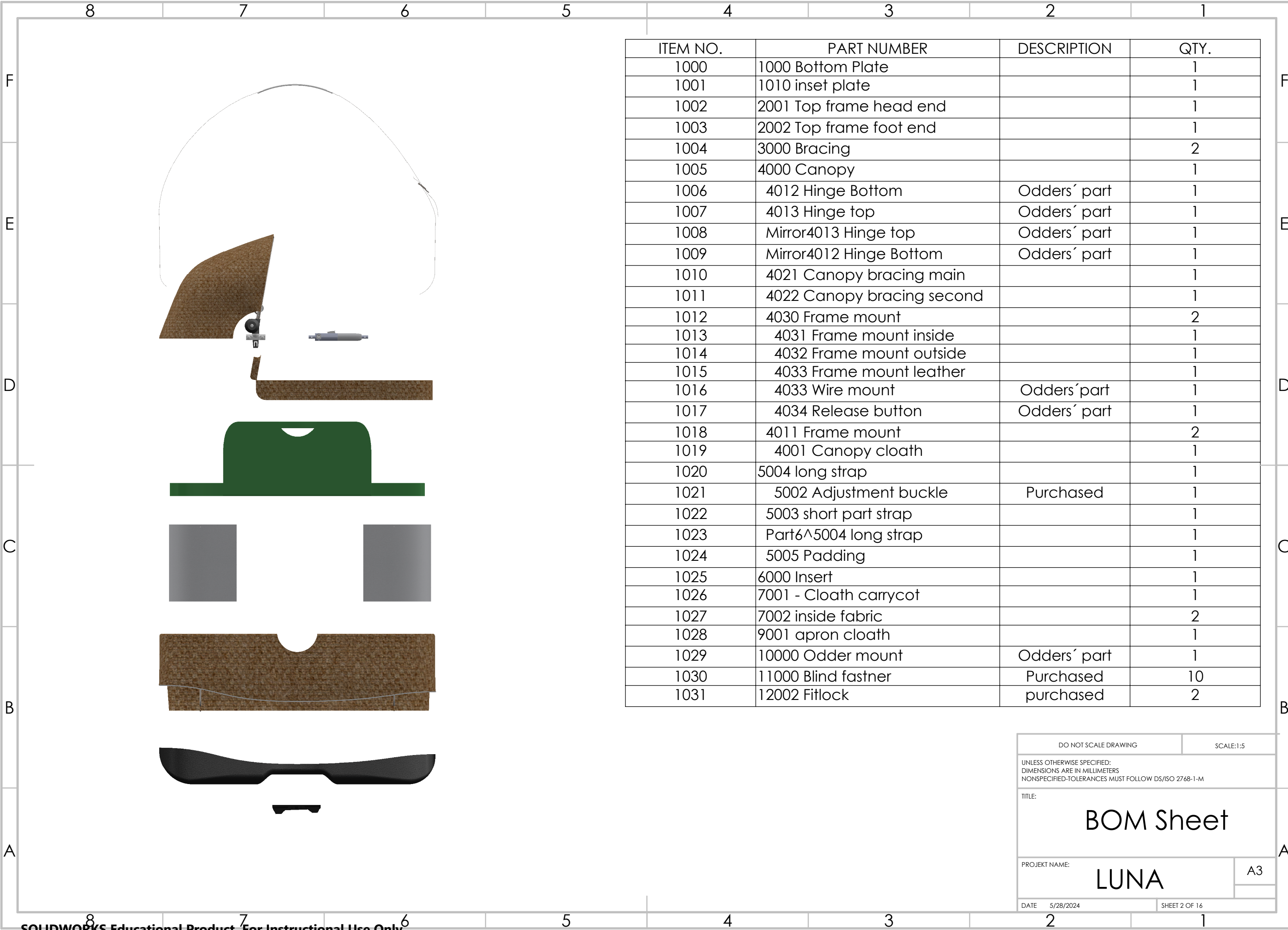
LENA

TECHNICAL DRAWINGS

AALBORG UNIVERSITY
JUNE 2024 MA4-ID6



DO NOT SCALE DRAWING		SCALE:1:5	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE: Overveiw			
PROJECT NAME: LUNA			A3
DATE 5/28/2024		SHEET 1 OF 16	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1000	1000 Bottom Plate		1
1001	1010 inset plate		1
1002	2001 Top frame head end		1
1003	2002 Top frame foot end		1
1004	3000 Bracing		2
1005	4000 Canopy		1
1006	4012 Hinge Bottom	Odders' part	1
1007	4013 Hinge top	Odders' part	1
1008	Mirror4013 Hinge top	Odders' part	1
1009	Mirror4012 Hinge Bottom	Odders' part	1
1010	4021 Canopy bracing main		1
1011	4022 Canopy bracing second		1
1012	4030 Frame mount		2
1013	4031 Frame mount inside		1
1014	4032 Frame mount outside		1
1015	4033 Frame mount leather		1
1016	4033 Wire mount	Odders' part	1
1017	4034 Release button	Odders' part	1
1018	4011 Frame mount		2
1019	4001 Canopy cloath		1
1020	5004 long strap		1
1021	5002 Adjustment buckle	Purchased	1
1022	5003 short part strap		1
1023	Part6^5004 long strap		1
1024	5005 Padding		1
1025	6000 Insert		1
1026	7001 - Cloath carrycot		1
1027	7002 inside fabric		2
1028	9001 apron cloath		1
1029	10000 Odder mount	Odders' part	1
1030	11000 Blind fastner	Purchased	10
1031	12002 Fitlock	purchased	2

DO NOT SCALE DRAWING

SCALE:1:5

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M

TITLE:

BOM Sheet

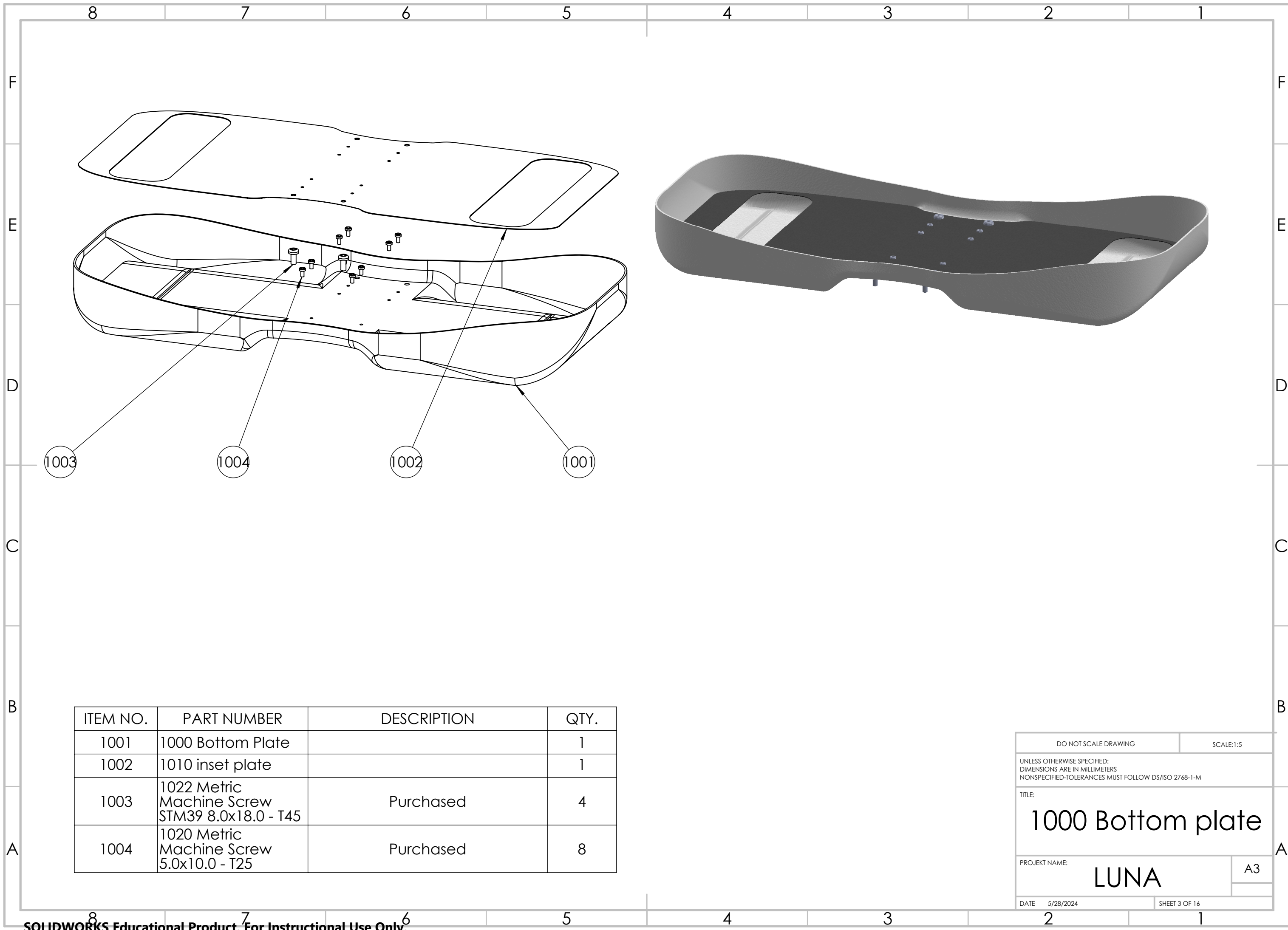
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LUNA

A3

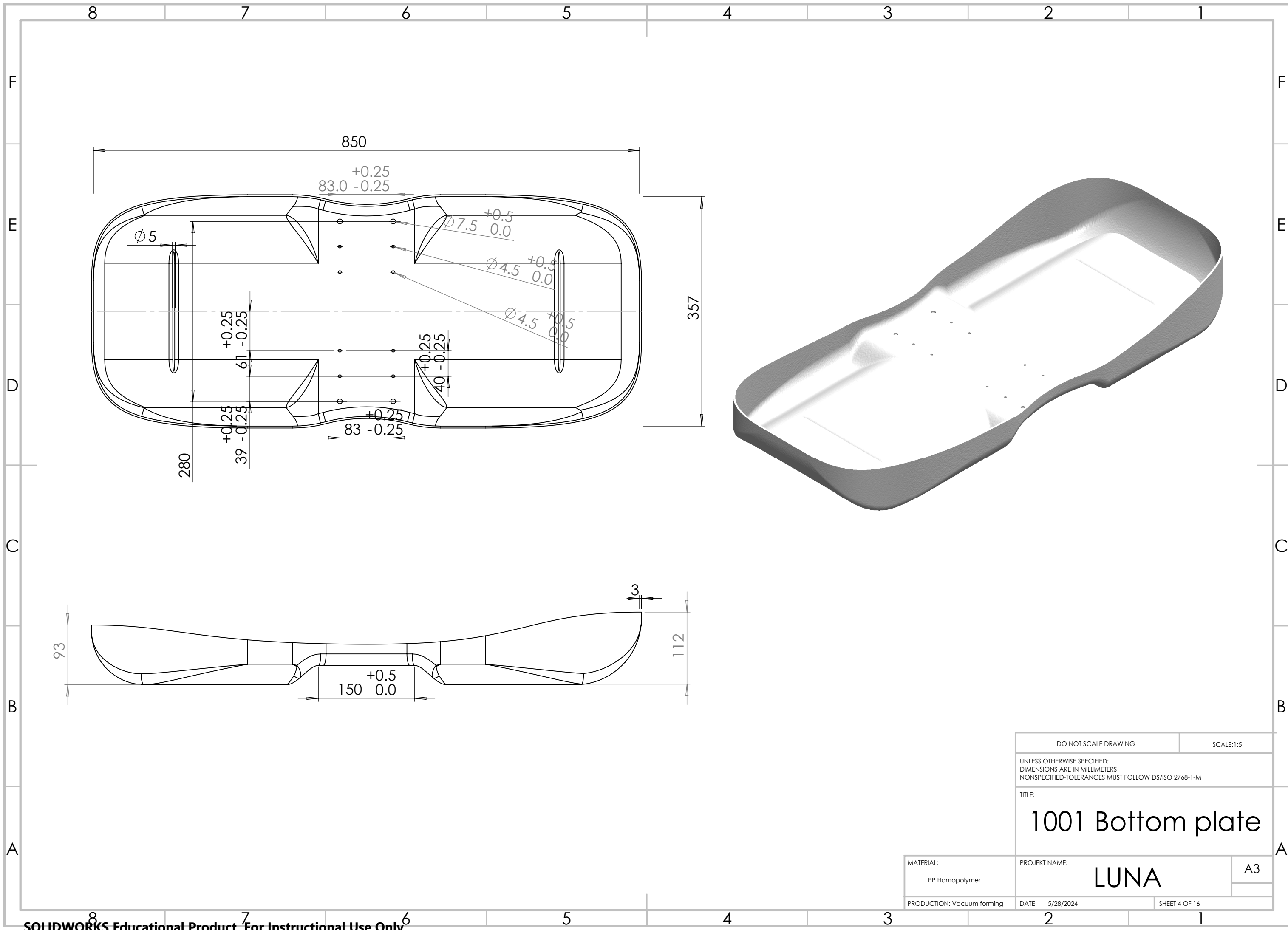
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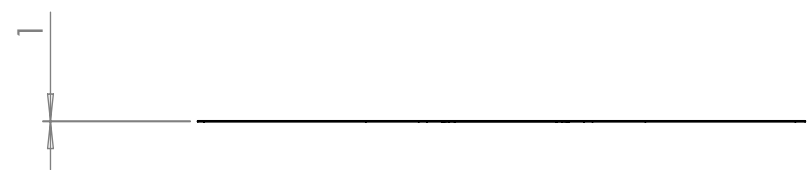
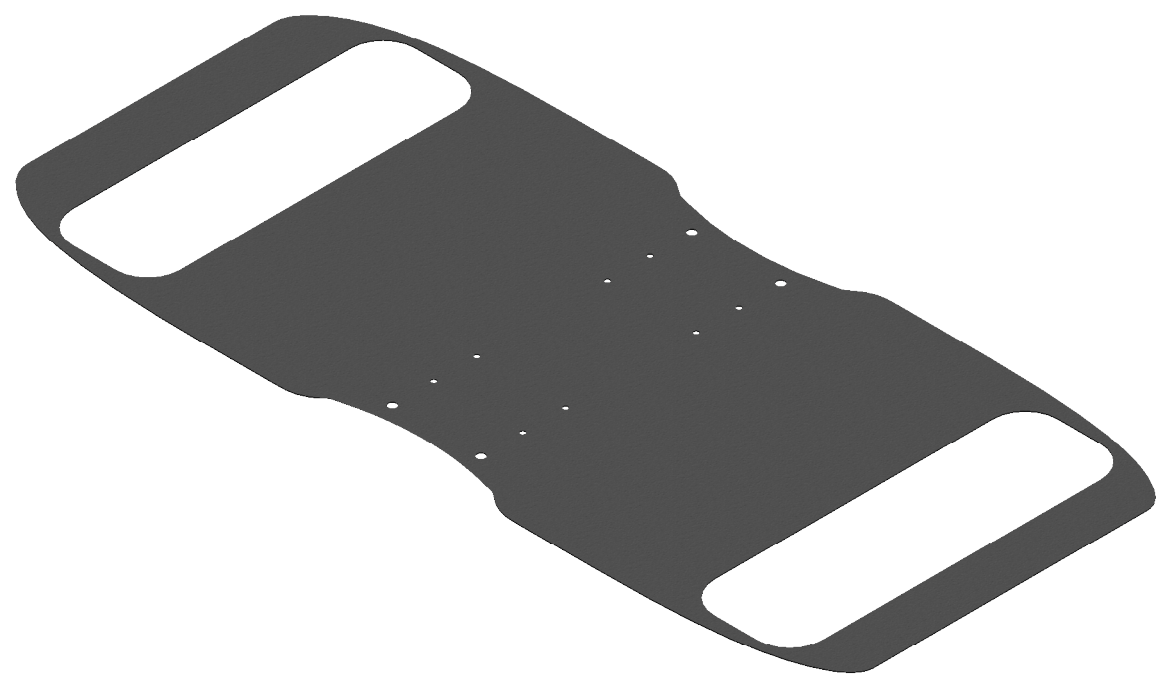
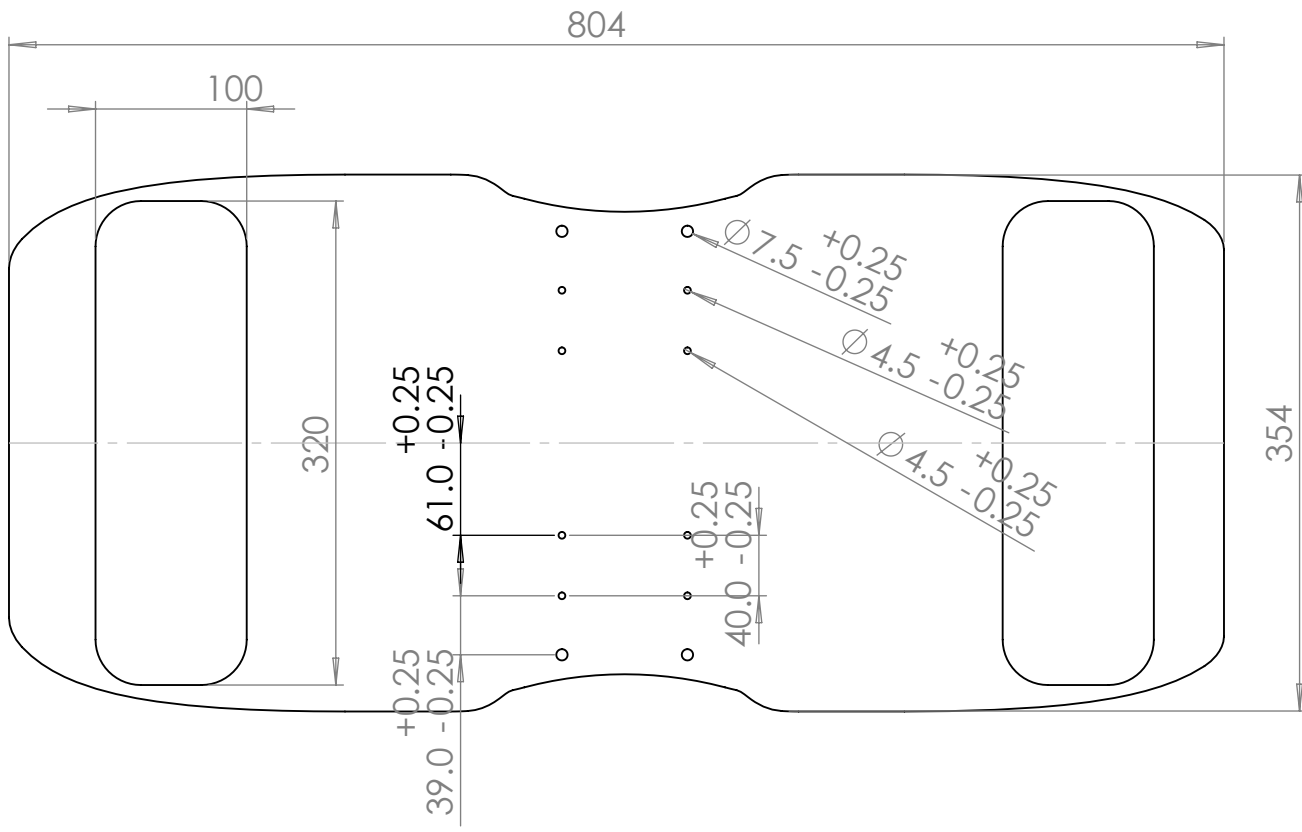
SHEET 2 OF 16



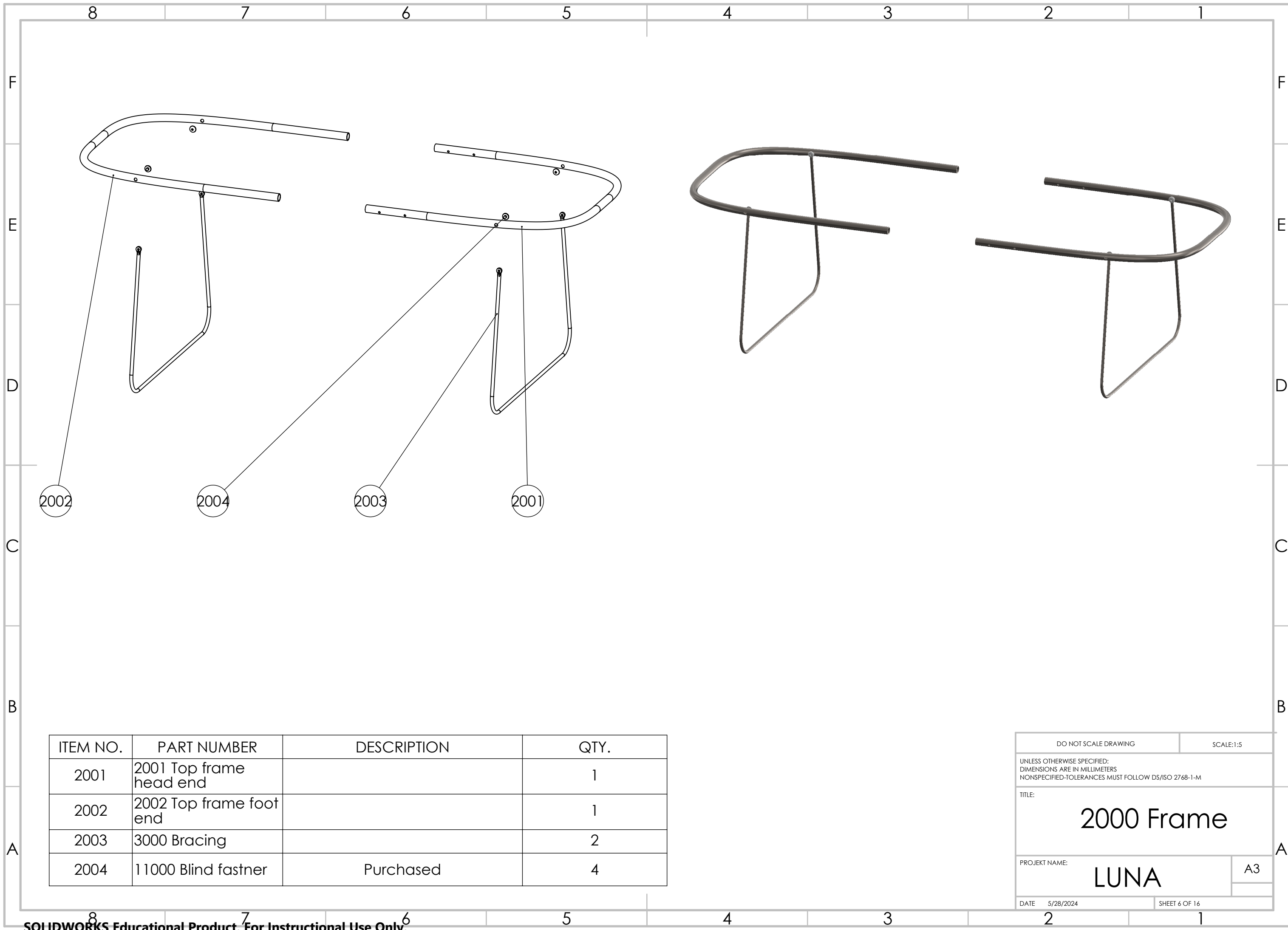
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1001	1000 Bottom Plate		1
1002	1010 inset plate		1
1003	1022 Metric Machine Screw STM39 8.0x18.0 - T45	Purchased	4
1004	1020 Metric Machine Screw 5.0x10.0 - T25	Purchased	8

DO NOT SCALE DRAWING		SCALE:1:5
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M		
TITLE: <div>1000 Bottom plate</div>		
PROJECT NAME: <div>LUNA</div>		A3
DATE	5/28/2024	SHEET 3 OF 16





DO NOT SCALE DRAWING		SCALE:1:5	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE: 1010 Insert plate			
PROJECT NAME:		A3	
DATE		SHEET 5 OF 16	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
2001	2001 Top frame head end		1
2002	2002 Top frame foot end		1
2003	3000 Bracing		2
2004	11000 Blind fastner	Purchased	4

DO NOT SCALE DRAWING

SCALE:1:5

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M

TITLE:

2000 Frame

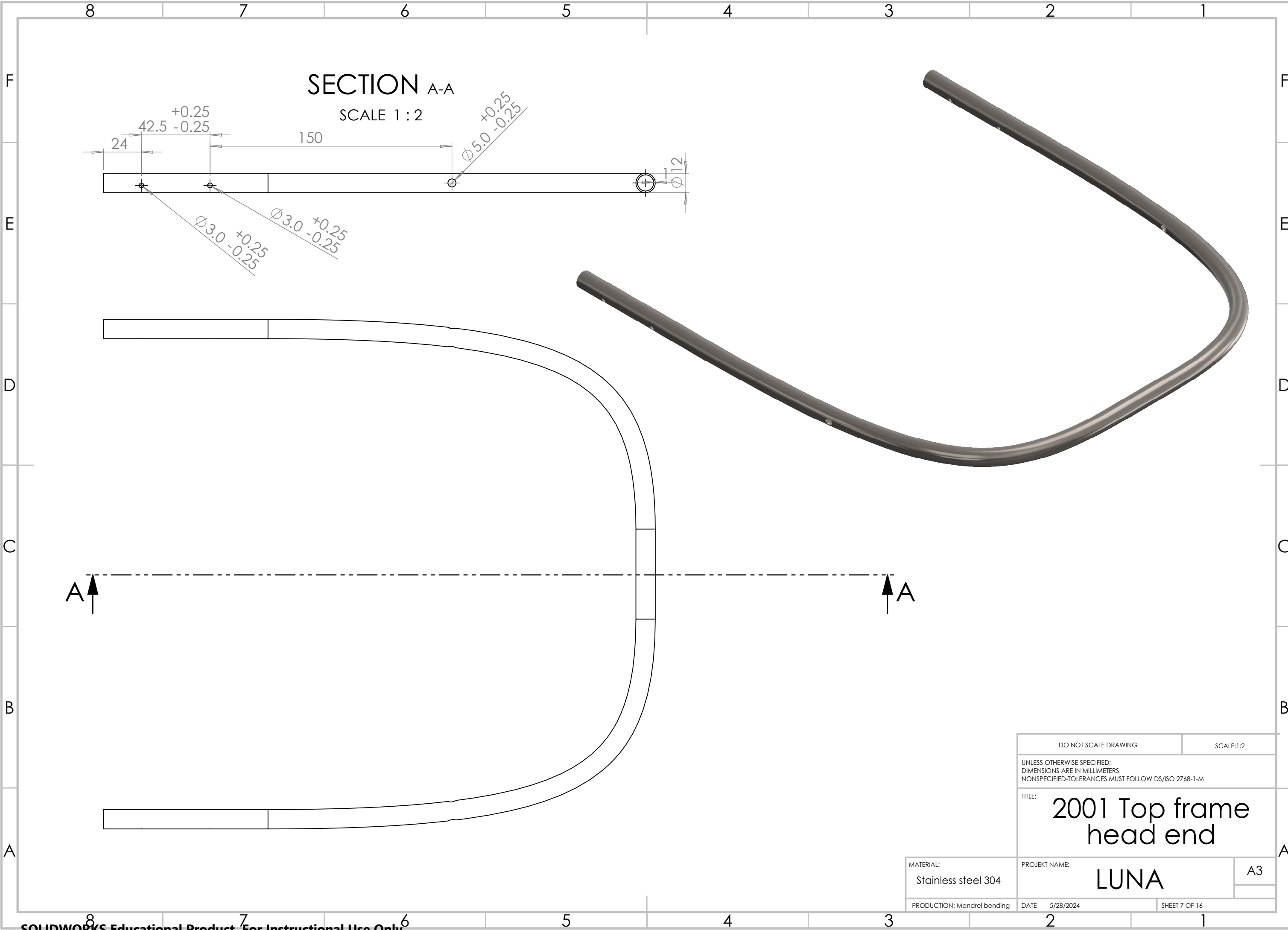
PROJECT NAME:

LUNA

A3

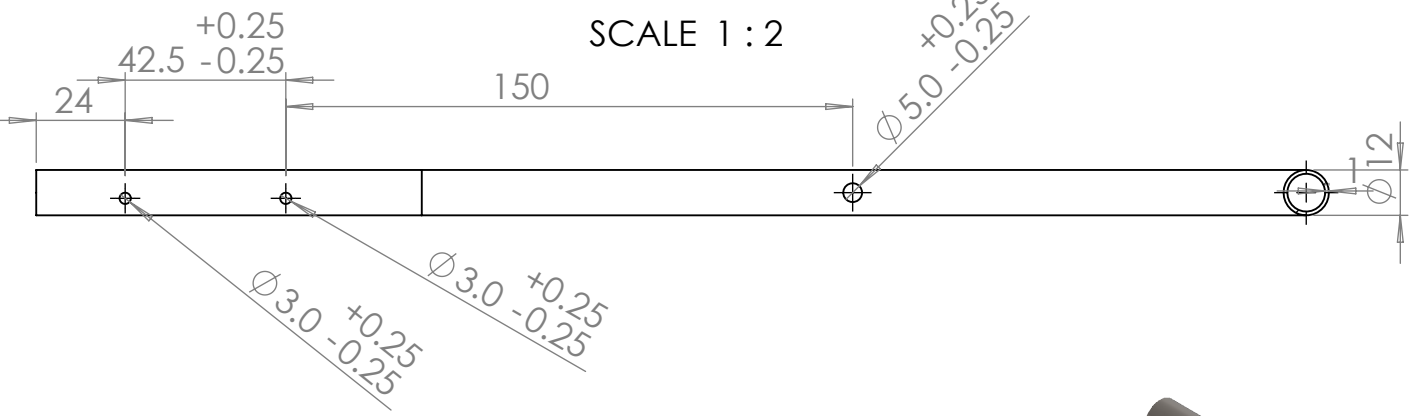
DATE 5/28/2024

SHEET 6 OF 16

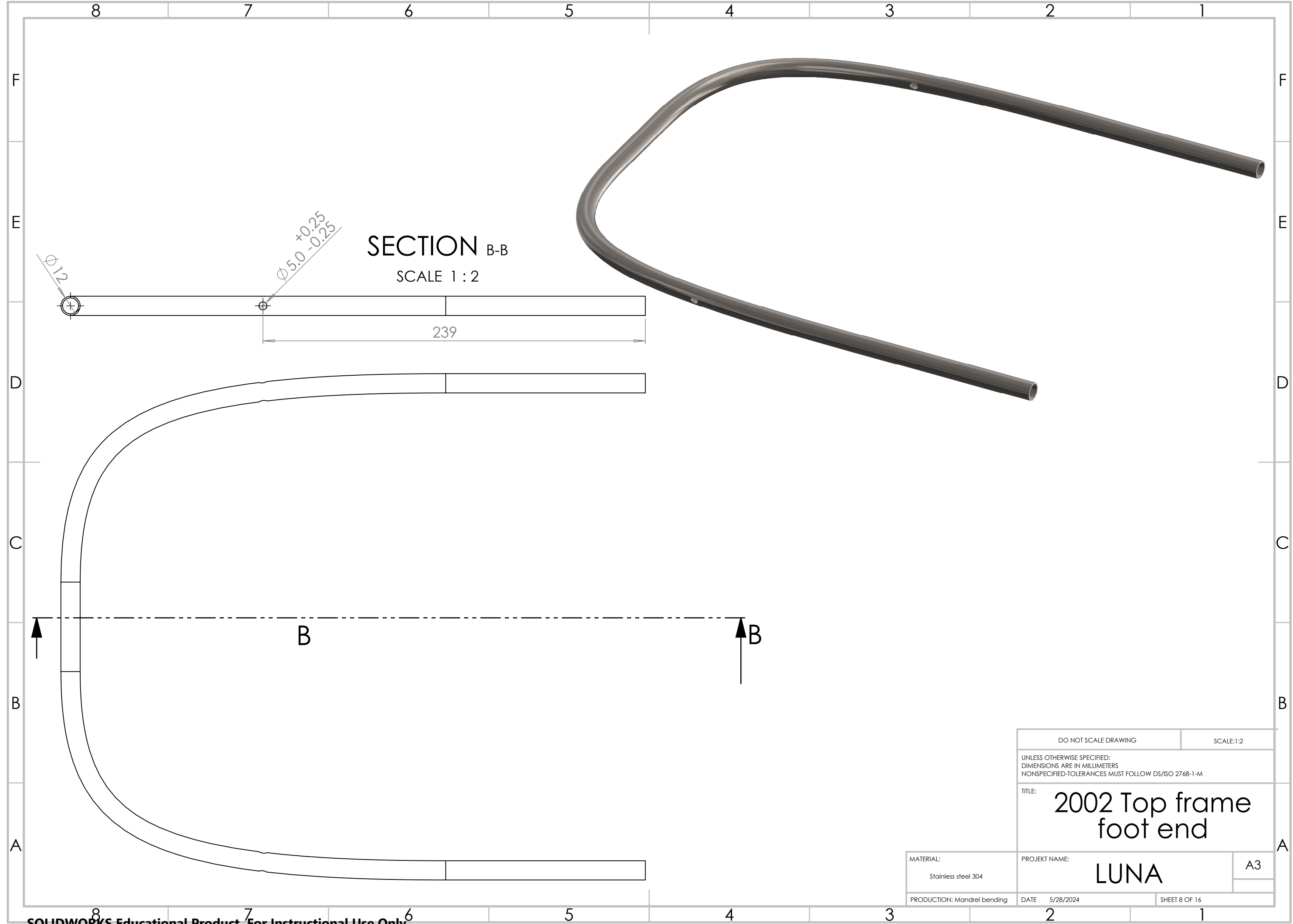


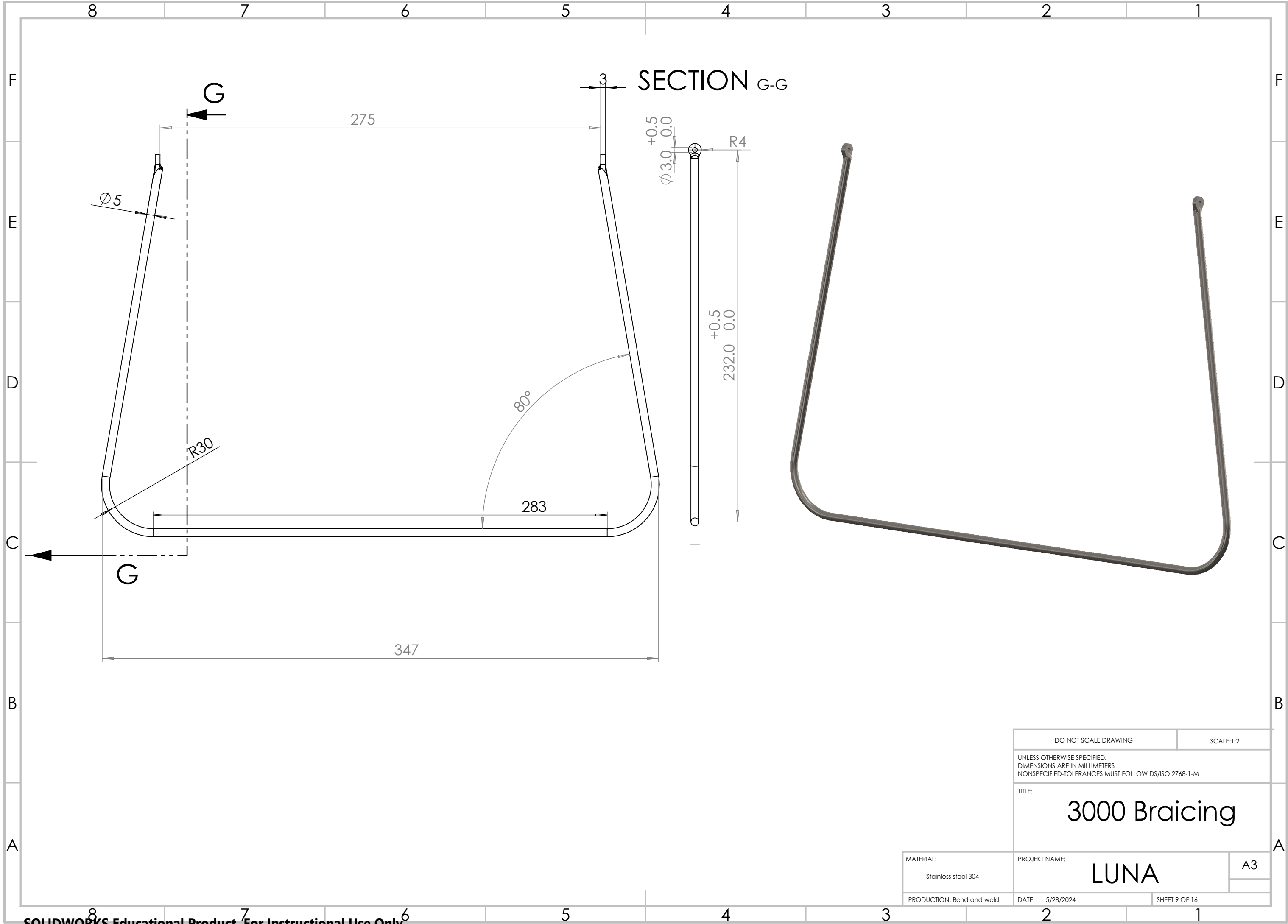
SECTION A-A

SCALE 1 : 2

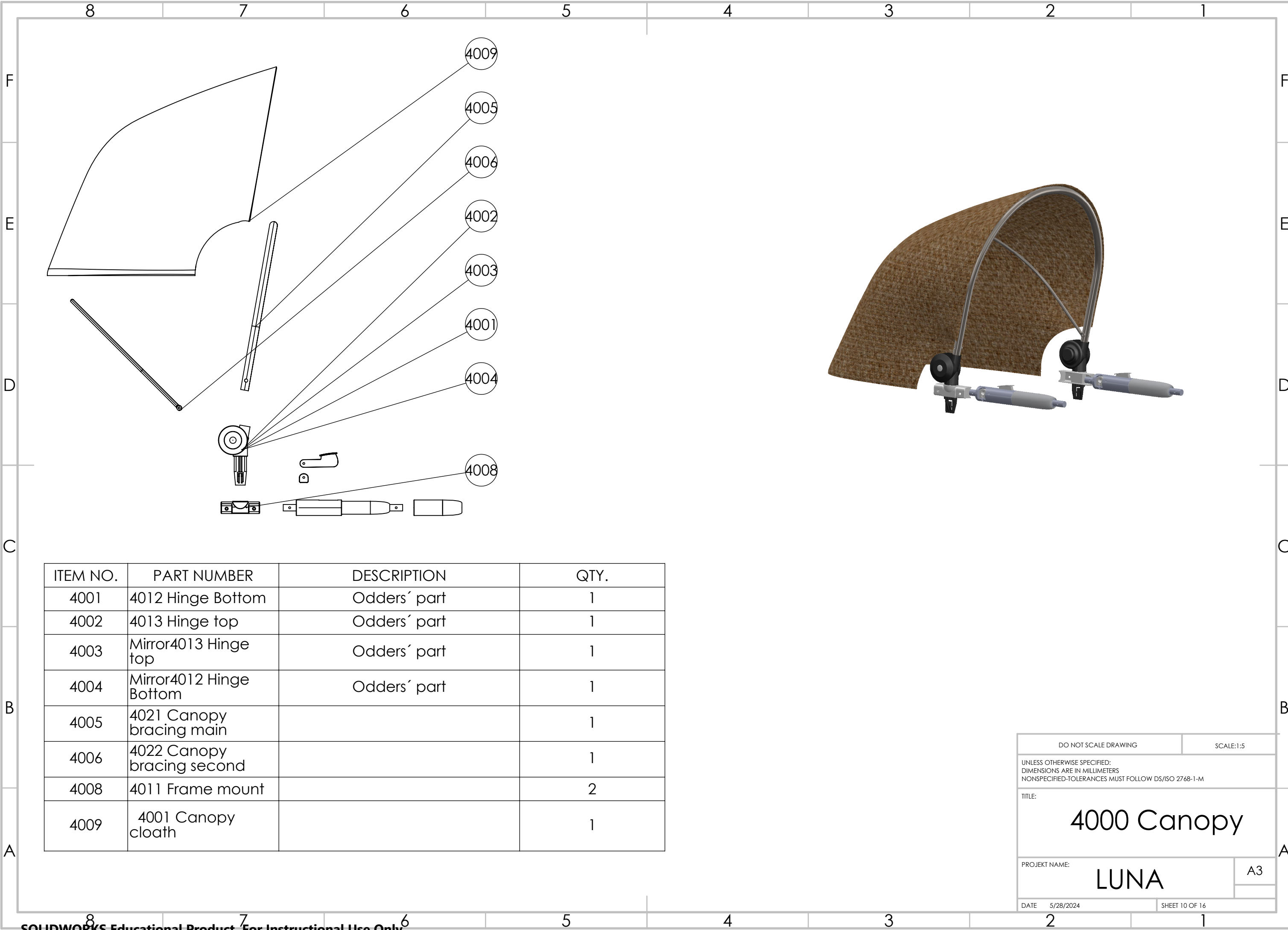


DO NOT SCALE DRAWING		SCALE:1:2	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE:		2001 Top frame head end	
PROJECT NAME:		LUNA	A3
DATE 5/28/2024		SHEET 7 OF 16	



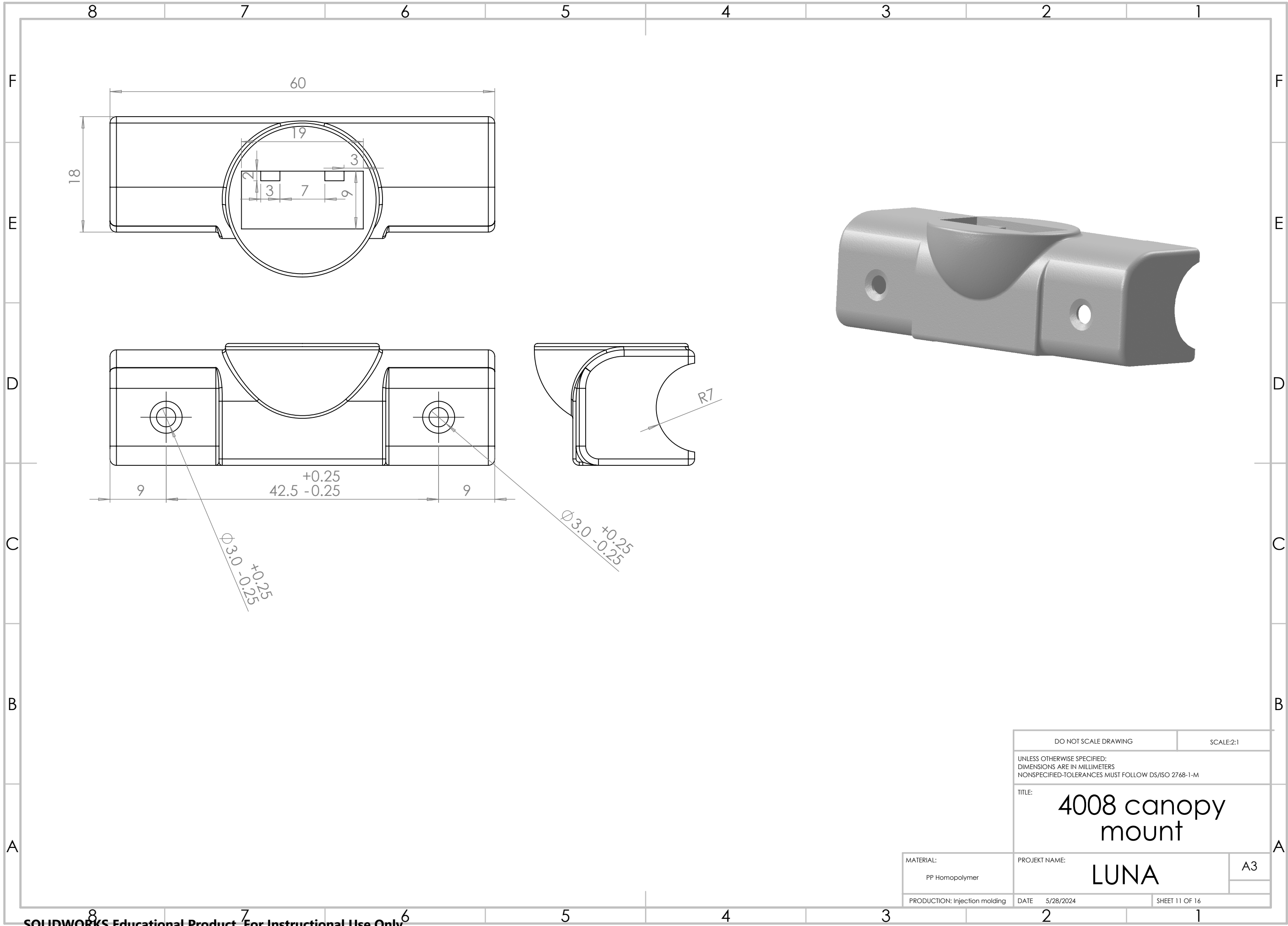


DO NOT SCALE DRAWING		SCALE:1:2	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE: 3000 Braicing			
PROJECT NAME:		LUNA	A3
DATE 5/28/2024		SHEET 9 OF 16	

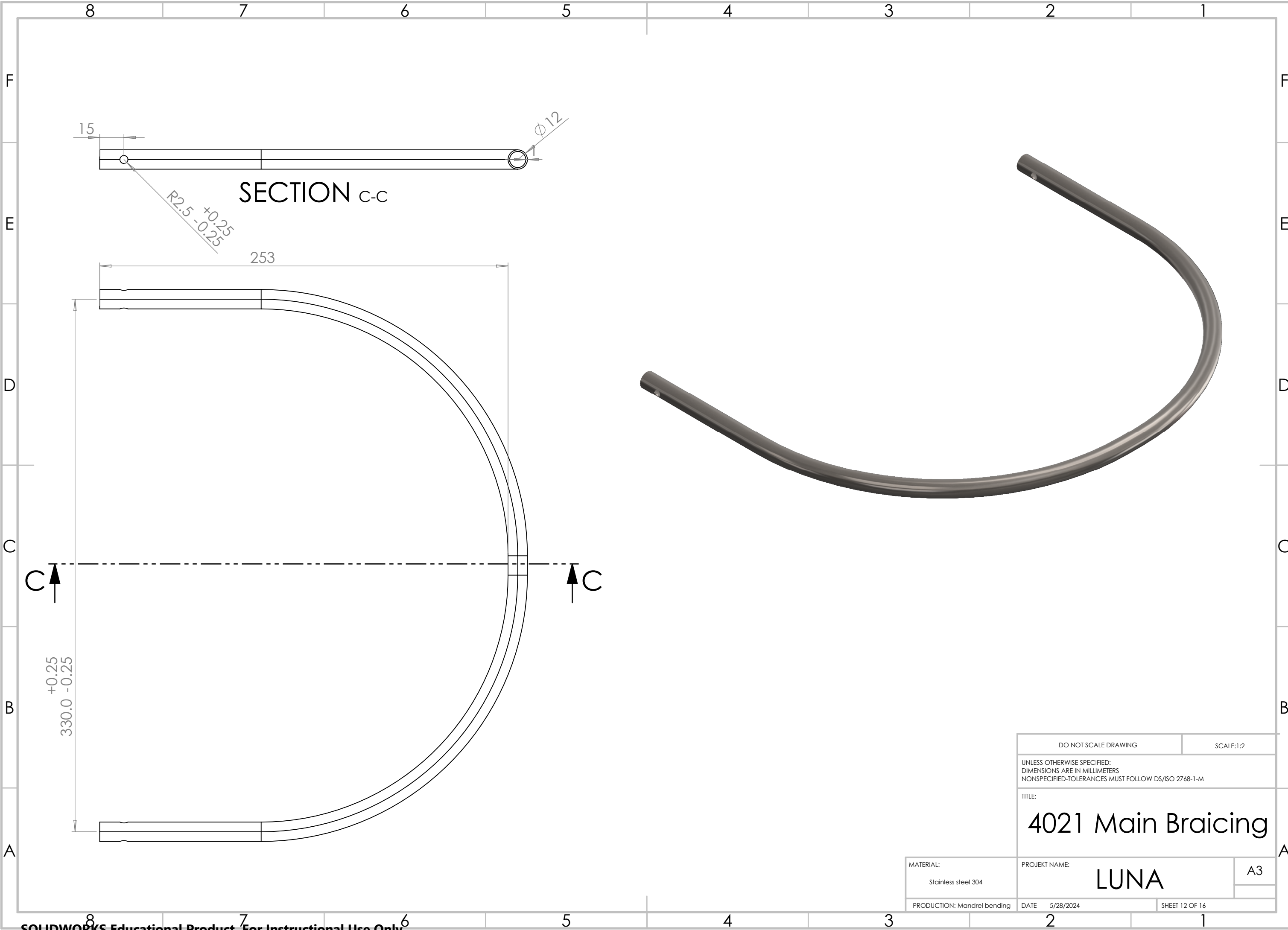


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4001	4012 Hinge Bottom	Odders' part	1
4002	4013 Hinge top	Odders' part	1
4003	Mirror4013 Hinge top	Odders' part	1
4004	Mirror4012 Hinge Bottom	Odders' part	1
4005	4021 Canopy bracing main		1
4006	4022 Canopy bracing second		1
4008	4011 Frame mount		2
4009	4001 Canopy cloath		1

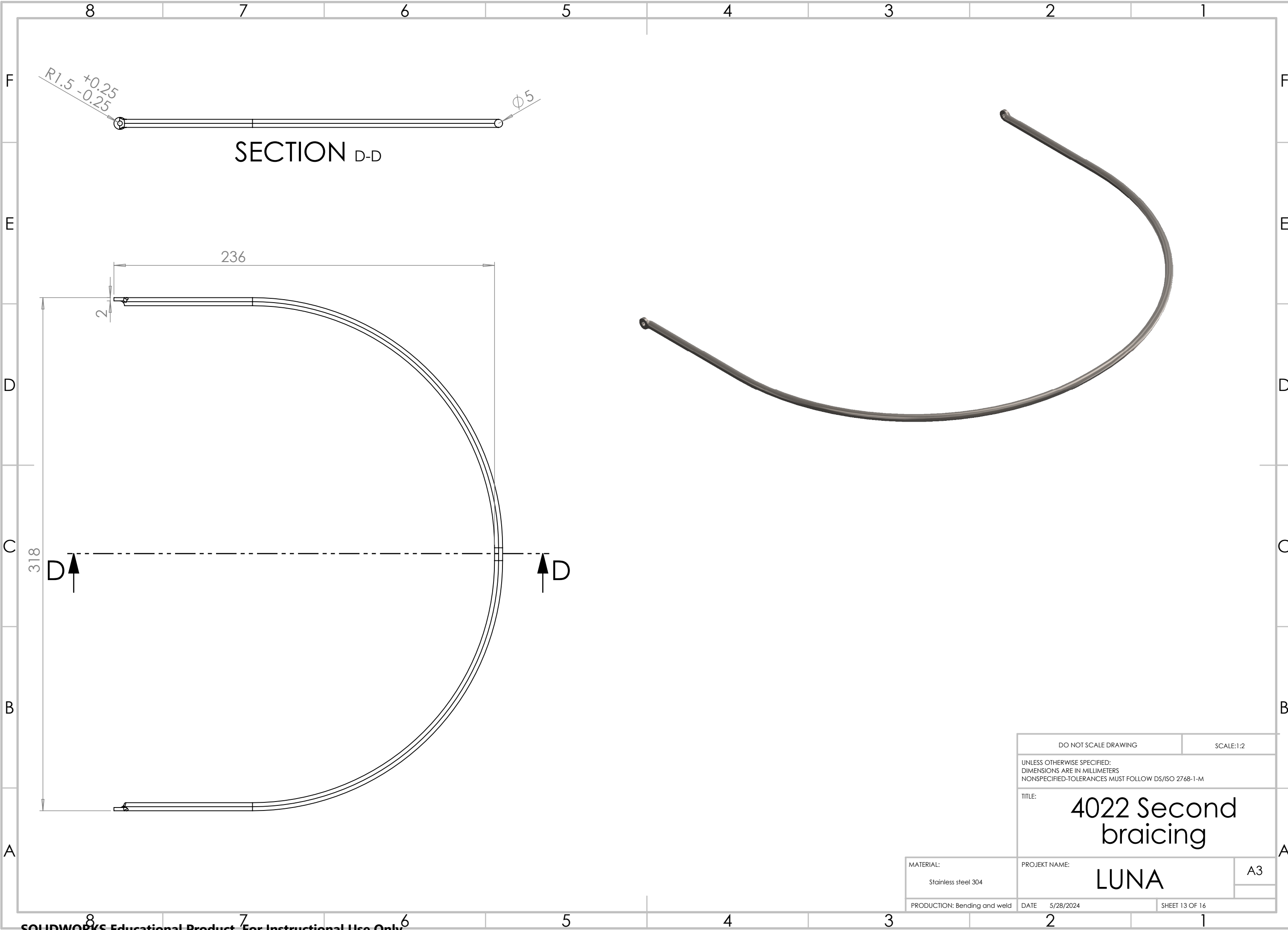
DO NOT SCALE DRAWING		SCALE:1:5
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M		
TITLE: 4000 Canopy		
PROJECT NAME: LUNA		A3
DATE	5/28/2024	SHEET 10 OF 16



DO NOT SCALE DRAWING		SCALE:2:1	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE: 4008 canopy mount			
PROJEKT NAME: LUNA			A3
DATE 5/28/2024		SHEET 11 OF 16	

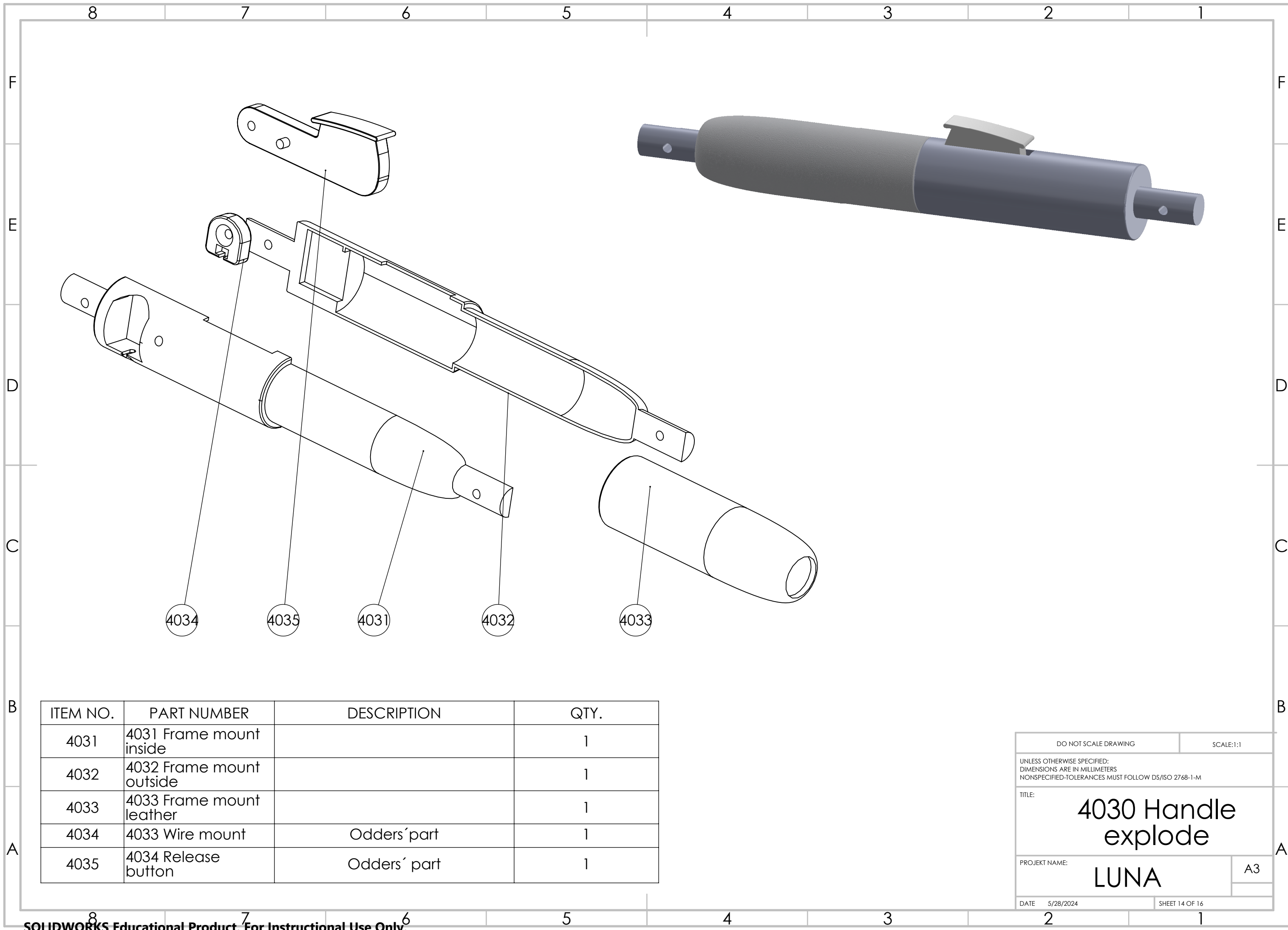


DO NOT SCALE DRAWING		SCALE:1:2	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE: 4021 Main Braicing			
PROJEKT NAME:		A3	
LUNA			
DATE 5/28/2024		SHEET 12 OF 16	



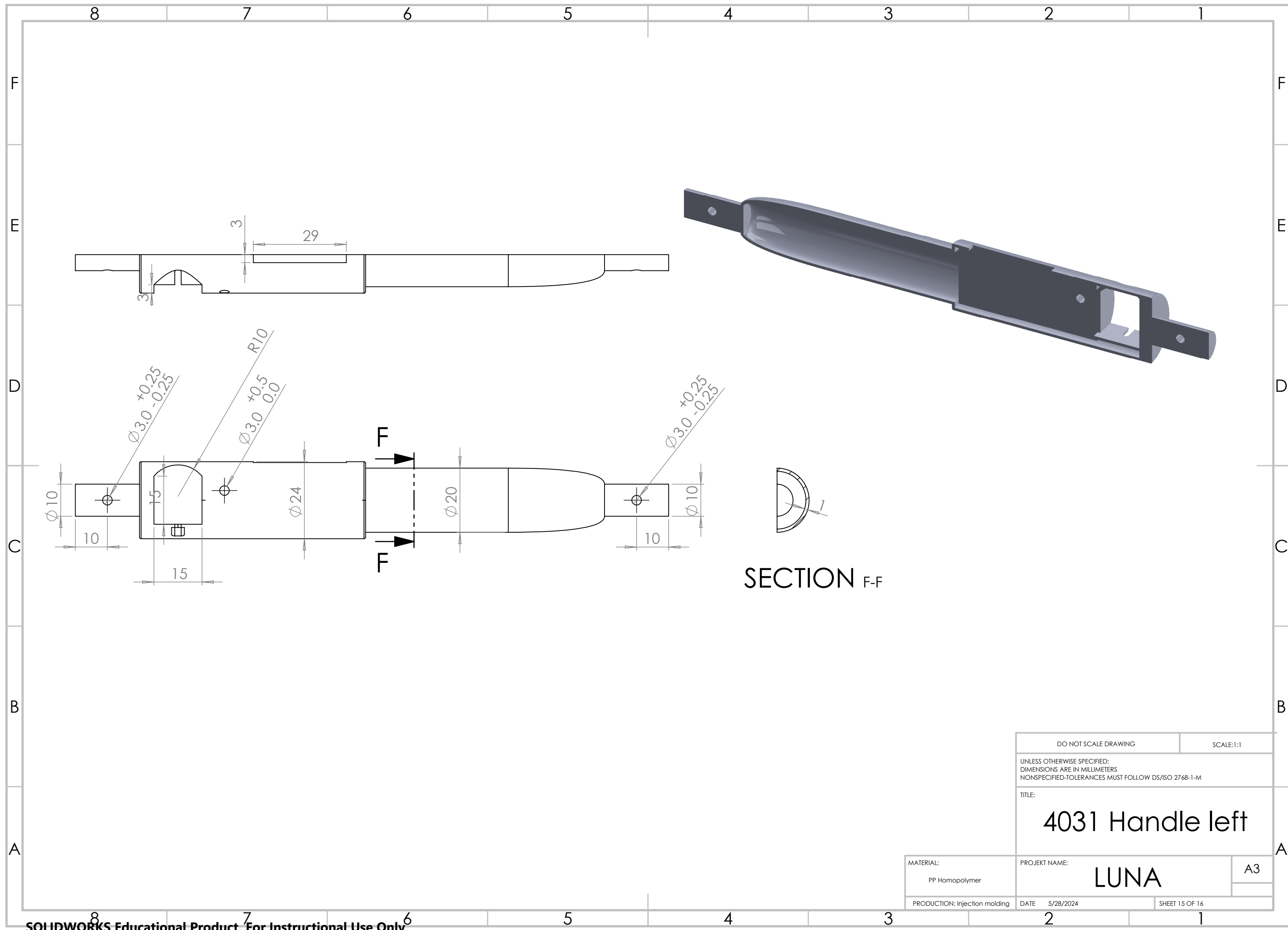
MATERIAL: Stainless steel 304		PROJEKT NAME: LUNA		A3
PRODUCTION: Bending and weld		DATE 5/28/2024	SHEET 13 OF 16	

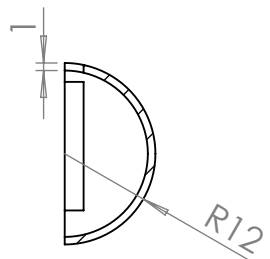
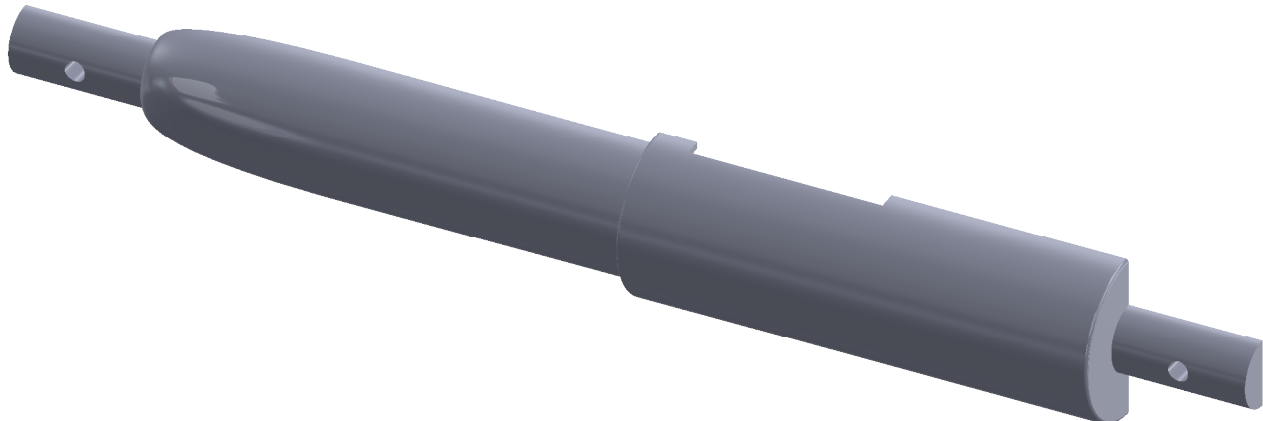
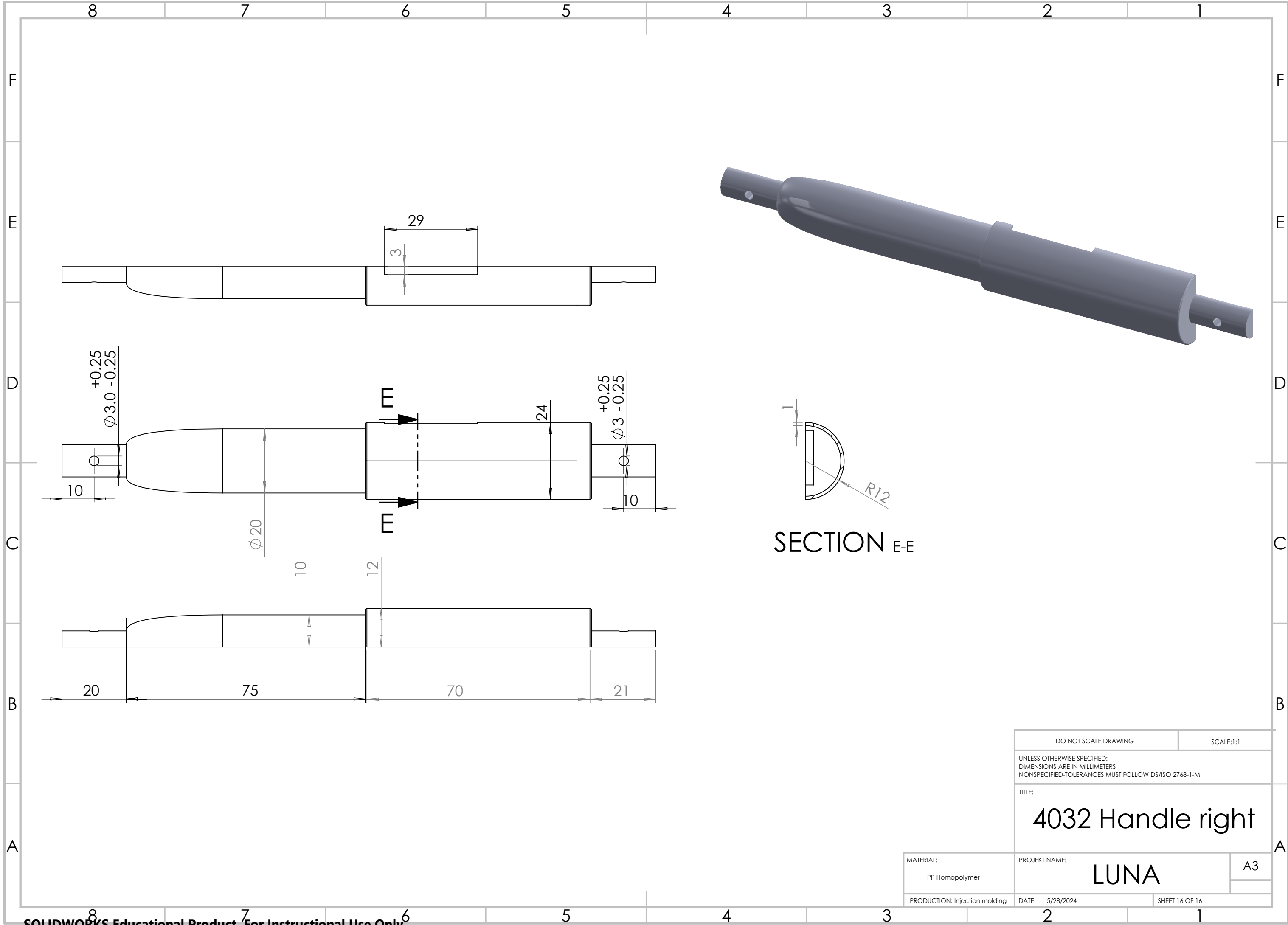
DO NOT SCALE DRAWING		SCALE:1:2	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE: 4022 Second braicing			



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4031	4031 Frame mount inside		1
4032	4032 Frame mount outside		1
4033	4033 Frame mount leather		1
4034	4033 Wire mount	Odders' part	1
4035	4034 Release button	Odders' part	1

DO NOT SCALE DRAWING		SCALE:1:1	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE:		4030 Handle explode	
PROJECT NAME:		LUNA	
DATE 5/28/2024		SHEET 14 OF 16	





SECTION E-E

DO NOT SCALE DRAWING		SCALE:1:1	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS NONSPECIFIED-TOLERANCES MUST FOLLOW DS/ISO 2768-1-M			
TITLE: 4032 Handle right			
PROJECT NAME:		LUNA	A3
DATE 5/28/2024		SHEET 16 OF 16	