Meeting the demands of the modern hospitality furniture:

The development of an outdoor table.

SWEET
Table

Jurgis Judžentis

/ 2023

LUND
UNIVERSITY

Meeting the demands of the modern hospitality furniture: **The development of an outdoor table.**

Jurgis Judžentis

Degree Project for Master of Fine Arts in Design, Main Field of Study Industrial Design, from Lund University, School of Industrial Design

Department of Design Sciences

Examiner: Prof. Claus-Christian Eckhardt
Supervisor: Lec. Carl Lidgard

ABSTRACT

Outdoor commercial furniture, particularly tables, often appears to lack well-designed products that address many concerns, including not only functionality and ergonomics but also aesthetic appeal. This study aims to investigate whether this perception reflects an actual problem and explore potential solutions. The purpose of this research is to explore the challenges associated with meeting the demands of modern hospitality outdoor tables, including functionality, durability, customer satisfaction, aesthetics, and other factors.

By using research methodology, such as literature review, surveys, interviews, and personal observations, some required features of outdoor tables were identified. The four main stakeholders were taken into account while conducting the research: restaurant customers, staff members, restaurant business owners/managers, and municipality authorities. By addressing issues such as table stability, locking features, ease of nesting, storage, and cleaning, a design solution was proposed. Then, the design was evaluated, and the intended goals were discussed. Further development and possibilities were also presented, along with insights from prototype manufacturing.

KEYWORDS

Outdoor table, Hospitality furniture, Furniture design

TABLE OF CONTENTS

PERSONAL BACKGROUND AND MOTIVATION

From my early years studying industrial design, I've always been passionate about furniture. This interest led me to intern at a rapidly growing modern furniture brand in Lithuania, where I gained valuable insights into the furniture market. Later in my career, I had the opportunity to intern at designer Boris Berlin's studio in Copenhagen, working on Scandinavian furniture projects and further deepening my knowledge in this field. While my master's studies exposed me to various design disciplines, broadening my understanding of industrial design, I chose to return to the furniture field because I believe there is still room for innovation.

My motivation to focus on outdoor furniture began during my bachelor's studies when I worked at a restaurant. I experienced firsthand the frustration and inconvenience of cleaning, nesting, storing, and locking outdoor furniture, especially after a long shift. Fast forward five years, I observed similar scenarios in outdoor cafes and restaurants in Lund. This prompted me to delve into this topic, aiming to apply my knowledge and skills to develop an outdoor table that serve to the needs of all users.

INTRODUCTION

The objects in our environment greatly influence our perception in different situations. Furniture, for example, has a significant impact on our actions based on its shape, functionality, materials, and other features. Take a lounge chair as an example: its design encourages us to relax and sit comfortably. On the other hand, when we come across a basic, box-like object as a seating option, our expectations for a satisfying resting experience decrease. This example highlights how people's expectations are shaped by the object's features that they can see in their surroundings.

In the hospitality industry, businesses try to present their services in the best possible way, often employing attractive advertisements that illustrates perfection. As consumers, we are attracted by these images and choose services based on the promises they make. However, when we focus specifically on the outdoor furniture of restaurants and cafes, can we confidently say that businesses are using the same effort to create inviting experiences? Perhaps not.

While there is a wide range of outdoor chairs available that serve to diverse needs, both in terms of functionality and aesthetics, the same cannot be said for outdoor tables. In fact, it is often difficult to recall the appearance of outdoor tables since they tend to have a generic design. In my personal opinion, the design of outdoor tables has been neglected, with business owners not giving them sufficient attention. Consequently, a significant potential is lost for various groups of people. This includes negative experiences for customers and loss of business for business owners. There are numerous stakeholders in this situation, which is why this research can be relevant in many cases.

This research includes a combination of literature review, survey data, and interviews conducted with restaurant workers and customers. By examining the historical evolution of outdoor furniture design and reviewing existing literature on commercial furniture and consumer preferences, we can identify gaps and areas for improvement. The insights gathered from survey responses and interviews will provide valuable input into the development of outdoor tables that better meet the needs of all people involved. The information gathered in this research will continuously contribute to the formulation of a clear design brief for further design explorations, test, considerations and final design proposal.

RESEARCH PROBLEM, PURPOSE AND KNOWLEDGE GAP

As mentioned in the introduction, the current outdoor commercial furniture, specifically the tables, seems to lack well-designed products. Several issues arise concerning functionality, ergonomics, functional features, material choices and aesthetic appearance. However, further research is required to determine whether this perception reflects an actual problem or is solely based on personal belief. Additionally, when viewed from a pragmatic standpoint, the existing market for outdoor tables often fails to meet the desired outcomes for all stakeholders. It appears that there are insufficient interest in this particular area of design. Therefore, this research aims to investigate the reasons behind these problems and explore potential solutions.

To specified and clarify, this research purpose is:
- Identify the key requirements and preferences for outdoor tables in the context of commercial/hospitality furniture design.
- Investigate the existing problems and challenges faced by both restaurants and customers regarding outdoor table functionality and aesthetics.
- Prove and enhance the need for well designed outdoor table for all stakeholders.

While there is existing research on furniture design and outdoor spaces in the hospitality industry, there is a significant knowledge gap when it comes to the specific requirements and challenges associated with outdoor table development. Previous studies may have explored outdoor furniture in general, but a more. In depth examination of the demands of modern commercial furniture and the unique considerations of outdoor tables is lacking. By addressing this knowledge gap, this research seeks to contribute valuable insights for the design and development of outdoor tables.

RESEARCH OBJECTIVES, STAKEHOLDERS AND IMPLICATIONS

Overall, the main research objective is to gather reliable information for the later development of outdoor table. However, to ensure specific and focused goals, the study aims to achieve the following research objectives:
1. Identify the specific requirements and challenges associated with outdoor table design in the context of modern commercial furniture based on literature research.
2. Evaluate the functionality and ergonomic considerations necessary for outdoor tables to meet the needs of users.
3. Investigate the existing problems and limitations in the design of outdoor tables, including issues related to functionality, ergonomics, materials, and aesthetic appeal.
4. Explore the preferences and expectations of stakeholders, including restaurant owners, customers, and industry professionals, regarding outdoor table design.
5. Examine the potential impact of outdoor table design on the overall dining experience, customer satisfaction, and business success in the hospitality industry.
6. Analyse innovative design approaches, materials, and technologies that can address the identified challenges and improve the quality and performance of outdoor tables.
7. Propose design guidelines and recommendations for the development of outdoor tables that align with the demands and trends of modern commercial furniture.

To ensure that the research findings and proposed solutions are relevant, practical, and aligned with the needs of the industry and end-users here is the list of stakeholders that this research includes:
1. Customers: The end-users of outdoor tables, customers' satisfaction and comfort are key factors in the success of restaurants and cafes. Understanding their preferences, expectations, and challenges they face with existing outdoor tables is essential in developing designs that serve to their needs.
2. Restaurant staff: Waiters, servers, and other restaurant staff interact with outdoor tables on a daily basis. Their firsthand experiences and feedback can help to identify usability, functionality, and practical aspects that need to be considered in the design process.
3. Restaurant and cafe owners: They are directly involved in the decision-making process regarding the selection and purchase of outdoor furniture, including tables. Their input and preferences are crucial in understanding the requirements and expectations for outdoor tables.
4. Government entities/municipal authorities: They play a significant role in regulating and setting guidelines for outdoor furniture in public spaces, including restaurants and cafes. Their involvement and input are important in terms of policies, standards, and regulations related to the design, placement, and safety aspects of outdoor tables.

Overall, the implications of this research is in improving the design and functionality of outdoor tables, enhancing customer satisfaction, ensure better working conditions and contribute to business success. To mention clear and concrete implications, here is the some of the most significant ones:

1. Design improvement: The research findings can lead to the development of outdoor tables that can be better in many ways compare to the existing ones in the market.
2. Business success: By addressing the limitations of current outdoor tables, businesses in the hospitality industry can create more inviting outdoor dining spaces. This can attract more customers, increase customer satisfaction, and potentially lead to improved business performance and profitability.
3. Customer satisfaction: Outdoor tables that are well-designed, functional, and aesthetically pleasing can contribute to a positive dining experience for customers.
4. Brand image and reputation: Restaurants and cafes that prioritise the design and quality of their outdoor furniture, including tables, can establish a strong brand image associated with excellence and attention to detail.
5. More appealing public spaces: creating attractive public spaces is an important goal of urban development in cities. Well-designed outdoor tables play a key role in achieving this goal by making the spaces look nice and work well for people to use.

METHODOLOGY

This research contains few different parts. For the first part, the literature review method was conducted over a period of three days. The limitations imposed on the research to remain relevant to the goals and within the time constraint were:
- Time: a time limitation of three days for researching literature and processing the findings
- Search database: the decision was made to search for articles or papers in LUBsearch and Google Scholars

To get more concentrated and usable information about the researchable topic, additional limitations were used on the literature findings from the databases:
- Material type: only academic journals
- English language only
- Limits on publication date: articles from the year 2000 and newer were taken into account
- To get more necessary information: not only peer-reviewed articles were shown

The search for articles was conducted using three main keywords and their synonyms:
1. Hospitality furniture (commercial furniture, restaurant furniture).
2. Furniture design (furniture ergonomics, industrial design, outdoor furniture design, patio furniture design).
3. Restaurant design (restaurant interior, dinning space design)

Additionally, towards the end of this section, a wealth of information was obtained not only from academic articles but also from online sources, articles in the journals, guides, and information provided by manufacturers.

In the second part of the research, qualitative interviews were conducted in Malmö, Sweden, to evaluate outdoor furniture. Additionally, personal assessments of 10 cases were carried out to examine the specific features of outdoor tables.These interviews were conducted using a short survey questionnaire over a one-day period in mid-April.

For the final part of the research, an online survey was used to find out the needs, preferences, and perceived problems of consumers in the restaurant industry. The survey was conducted over a three-day period and received 31 responses. The participants included not only friends but also professionals in the interior design field, who were found through specific *Facebook* group pages.

LITERATURE REVIEW

1. Evolving dining spaces

First and foremost, to discuss commercial furniture for service related to food, we must comprehend the evolving needs of places where food and beverages are provided. By understanding how public eating places have changed and how their requirements have shifted over time, we can explore the changing role of furniture in these spaces. Throughout history, the concept of eating places has evolved significantly. In ancient civilisations, restaurants emerged due to the lack of kitchens in homes, leading to "thermopolia" or public spaces for serving food and beverages (Alex, 2017). While some link the origin of restaurants to the French Revolution of 1789, others argue that it began even earlier (Kiefer, 2002). Later, after World War II in Britain restaurants introduced meal services using a cafeteria approach. Additionally, they incorporated other food provision schemes such as community feeding centres, school and workers' canteens, cooking depots, emergency meal centres, rest centres, and mobile canteens (Atkins, 2011). However, without delving into the intricate details and history, it is useful for this research to understand the evolution of eating places: from establishments where people gathered to obtain complete nutrition and maximise the efficiency of their collective resources, to modern restaurants that focus on maximising profits, gaining competitive advantage, conserving space, providing fast service, and other capitalist goals (Ukabi et Gurdalli, 2021). With these changes, the objects surrounding the hospitality area, including furniture, have also evolved. Furthermore, It's worth noting that that according to 2022 date restaurant industry is growing and growth will continue upcoming years (National restaurant association, 2022).

It is also worth mentioning that the term "restaurant" can be understood differently in various scenarios. In one source (Ukabi et Gurdalli, 2021), restaurants are categorised into two types: commercial and non-commercial/institutional. Commercial restaurants are associated with pleasure and social dining, while the other group comprises institutional eating places such as hospitals, schools, prisons, corporate staff cafeterias, cruise ships, and so on. In this research, we will use the term "restaurant" in a broad sense. However, it is worth noting that the later case study research will focus exclusively on the first category of restaurants, which are the commercial ones.

2. Furniture's impact on dining experiences

As described before, people public eating have transitioned from basically fulfilling nutritional requirements to seeking more enjoyable experiences. There is no denying that food is one of the few key activities associated with happiness. Actually, in line with recent studies on positive emotions, it has been shown that fundamental needs, such as eating, play a significant role in generating happiness (Berenbaum, 2002). A different

research discovered that over a third of daily meals are associated with positive feelings (Macht et al., 2004). With this understanding, the restaurant industry recognised that they serve not only food but also positive emotions. This led businesses to focus on not just the food and beverages they provide, but also the overall atmosphere. This surrounds various elements, such as the restaurant's brand, image, interior, lighting, scents, menu design, and more, all contributing to an enjoyable dining experience. Therefore, the creation of dining atmosphere with a unique ambiance has become increasingly appealing to restaurant owners in order to draw in customers (Scott, et.al, 2009).

As presented before, one of the elements of creating desirable atmosphere, or, in other word, good servicescapes, is interior and furniture. Numerous studies include importance of it: Lin (2004) discovered that furniture and interior can influence how customers feel even before they start receiving service. Ukabi and Gurdali (2021) describes how interior elements evoke customers psychologically: "It influences order mode, duration of stay, tendency to return to, and make referrals." The essay from *The Restaurant Times* highlights the importance of restaurant furniture, which include serving as a branding and marketing strategy, aiding in defining the restaurant's concept in social media, and playing a crucial role in promoting sales through attractive interior designs. According to Heung and Gu's research (2012), restaurants can enhance customers' dining experiences and increase their willingness to pay more for food by effectively utilising atmospheric attributes, which have also resulted in positive word-of-mouth feedback. Kim, Lee and Yoo (2006) also noted that restaurants can attract customers through novelty in design. Han and Ryu (2009) observed that furniture plays a crucial role in creating an efficient spatial layout that affects the comfort of customers. A well-designed furniture layout also helps to create an environment that prevents restaurant customers from feeling crowded. To add up, Nguyen and Leblanc's study (2002) suggests that the physical environment, including elements like furniture can convey to customers that the service being offered is reasonable in terms of its nature, value, and pricing, especially during the customer's first visit. According to Menon and Kahn's research (2002), the design elements of decor and furniture have the potential to set apart a particular restaurant business from its competitors. In other words, a restaurant's unique decor and furniture can be a distinguishing factor that attracts customers and helps the business stand out in a crowded marketplace. Also, furniture have a significant independent role in forming customer loyalty (Han et Ryu, 2009).

In conclusion, the role of furniture in restaurants has evolved alongside the changing needs and goals of eating establishments throughout history. As the focus of these spaces has shifted from providing basic nutrition to offering enjoyable experiences and creating positive emotions, the restaurant industry has recognised the importance of atmosphere in attracting and retaining customers. Furniture and interior design play a significant part in shaping this atmosphere, with numerous studies highlighting their impact on various aspects of the dining experience. By effectively utilising furniture and other elements of the physical environment, restaurants can create a unique ambiance that sets them apart in a competitive market and contributes to their overall success.

List below concludes findings and highlights importance for two stakeholders of this projects: restaurants and cafes business and their customers.

Factors how well designed and arranged furniture can be beneficent for r**estaurant business**:

1. Influences customers' feelings even before they start receiving service (Lin, 2004).
2. Serves as a branding and marketing strategy (The Restaurant Times).
3. Aids in defining the restaurant's concept on social media (The Restaurant Times).
4. Promotes sales through attractive interior designs (The Restaurant Times).
5. Enhances customers' dining experiences (Heung and Gu, 2012).
6. Increases customers' willingness to pay more for food (Heung and Gu, 2012).
7. Contributes to positive word-of-mouth feedback (Heung and Gu, 2012).
8. Attracts customers through novelty in design (Kim, Lee, and Yoo, 2006).
9. Creates an efficient spatial layout affecting customer comfort (Han and Ryu, 2009).
10. Conveys the value and pricing of the service offered (Nguyen and Leblanc, 2002).
11. Sets the restaurant business apart from competitors (Menon and Kahn, 2002).
12. Forms customer loyalty (Han and Ryu, 2009).
13. Helps businesses focus on providing positive emotions alongside food and beverages (Berenbaum, 2002; Macht et al., 2004).

Factors how well designed and arranged furniture can be beneficent for **customers of the restaurants**:

1. Influences customers' feelings and overall experience (Lin, 2004; Ukabi and Gurdali, 2021).
2. Affects order mode, duration of stay, and likelihood to return or refer others (Ukabi and Gurdali, 2021).
3. Increases customers' willingness to pay more for food (Heung and Gu, 2012).
4. Contributes to a more comfortable dining experience (Han and Ryu, 2009).
5. Helps to prevent customers from feeling crowded (Han and Ryu, 2009).
6. Provides cues about the nature, value, and pricing of the service being offered (Nguyen and Leblanc, 2002).
7. Creates a unique and distinguishing environment (Menon and Kahn, 2002).
8. Contributes to enjoyable dining experiences by complementing other atmospheric elements (Scott et al., 2009
9. Plays a role in generating happiness through fulfilling fundamental needs such as eating (Berenbaum, 2002).

3. Importance of outdoor dining spaces

It is now clear why well-designed furniture that matches the restaurant goals is important. However, before delving into the specifics of outdoor table design, it is essential to acknowledge the significance of outdoor spaces for restaurants. By recognising the importance of these areas, we can gain a better understanding of how outdoor tables should be designed to create an optimal dining experience for customers.

Restaurantbusinessonline magazine states, that having an outdoor dining area can expand the restaurant's seating and generate more revenue, resulting in increased profits for the business. The study conducted by Happy City, an urban planning and design consultancy based in Vancouver, found that patios created in collaboration with five local breweries not only helped protect their revenues but also enhanced happiness and sociability among patrons, with a greater percentage of people observed laughing and engaging in conversation while seated outside compared to indoors (Thomson, 2021). Asadorian (2022) present few points: Setting up outdoor dining along the sidewalk effectively extends a restaurant's visibility. This proximity to potential customers strolling by can entice them to visit the restaurant spontaneously, making it more accessible and inviting. 91% of New York City restaurants said permanent outdoor dining is very important to the future of their business, according to a February NYC Hospitality Alliance survey. Asadorian (2022) states that outdoor eating areas have now become special places that catch people's interest by themselves, since they incorporate their own style into it. Another significant factor is that, according to the author's source, 24% of Americans consider outdoor dining to be one of the most crucial aspects when choosing a restaurant to visit. He states opinion, that outdoor dining spaces benefit neighbourhoods by repurposing public spaces for human use. They can even be incorporated into pedestrian areas, improving the surroundings. Additionally, fees for setting up street-side cafes and increased sales tax revenue provide incentives to maintain these programs. In Zolas' (2020) opinion, outdoor dining spaces bring more tables, customers, and revenue to restaurants. They also offer additional benefits, such as boosting people's mood with plants and fresh air, being pet-friendly to attract more dog owners, and making it easier for parents to bring their kids along without worrying about noise levels. In Vstreetfood article, author gives few more pros to outdoor dining: Outdoor dining is a free advertising for your business. Also, having seating outdoors at your premises can help grow and build your business brand.

Since it is evident that outdoors dining areas are important for people and business in many ways, in the later stages of the design process for the outdoor table, we should keep these points in mind and try to incorporate them into the design. List below concludes findings and highlights importance for two stakeholders of this projects: restaurants and cafes business and their customers.

Factors how outdoor dining spaces can be beneficent for **restaurant business**:

1. Outdoor dining areas can expand seating and generate more revenue, resulting in increased profits.
2. The restaurant's closeness to people walking by can attract them to visit spontaneously.
3. Fees for setting up street-side cafes and increased sales tax revenue provide incentives to maintain outdoor dining programs.
4. Outdoor dining spaces provide free advertising for businesses and help grow and build their brand.

Factors how outdoor dining spaces can be beneficent for **customers of the restaurants**:

1. Outdoor dining areas boost people's mood with plants and fresh air.
2. Pet-friendly patios attract more dog owners.
3. Outdoor dining areas make it easier for parents to bring their kids along without worrying about noise levels.
4. Outdoor eating areas have become special places that catch people's interest by themselves.
5. Outdoor dining spaces benefit neighbourhoods by repurposing public spaces for human use.

FUNDAMENTAL CHARACTERISTICS

Table is one of the most important piece of furniture in the restaurant so understanding and considering table characteristics is crucial for success in the hospitality industry. By understanding the ways that table type and location of it affect the amount of time and money spent, restaurant operators and designers can develop facilities that will assist in revenue maximisation (Kimes et Robson, 2004). In the study conducted by Kimes and Robson, they discovered that larger tables, booths, or banquette seats did not generate a significantly higher spending per minute (SPM). This finding suggests that smaller or less comfortable tables may contribute to improved profits for restaurants. In the context of outdoor tables, which are the main focus of this research, this observation also aligns with the understanding that restaurants typically try to conserve space in their outdoor areas due to the limited availability provided by cities. Morika and Ratum (2021) identify the importance of furniture for humans: "Furniture, as one of the elements in public space, has an important function in the form of non-verbal communication between humans." So, keeping this motivating quote in mind, later in this chapter, the discussion will focus on the various characteristics of outdoor tables in relations to human needs and ergonomics.

1. Materials, sizes and shapes

If we were to identify the table characteristics with the most significant impact, a survey (Tuzunkand et Albayrak, 2016) revealed that clean furniture, attractive colors, and furniture quality were among the most important factors contributing to 'Facility Aesthetics'. Although many features can be the same, most criteria used in indoor table design cannot be adapted for outdoor tables. First of all, outdoor tables require special materials and construction to withstand the weather conditions they will be exposed to. Exposure to sun, temperature, and rain can damage outdoor tables in several ways, including mold, mildew, and rot, rust and corrosion, fading, cracking, and heat retention (Ferris, 2023). In the article "Outdoor Furniture Materials Guide," the author emphasises that furniture materials should be chosen based on durability, especially for furniture that will see frequent use. The importance of weight is also highlighted, as heavy furniture is less likely to be damaged by wind. Additionally, the guide stresses the importance of cleaning and care for outdoor furniture, and presents easy-to-clean materials and surface treatments for this purpose. Ferris (2023) highlights that the most common and best materials for outdoor tables are metal, such as stainless steel, aluminium, and iron, as well as hardwoods and certain types of plastics. It is worth noting that many brands or suppliers offer table bases separately, allowing customers to choose the table top they prefer. Typically, table tops are available in wooden or laminated panels.

To deepen knowledge for making better choices of materials for outdoor tables, the following table is presented. Materials are evaluated using a 5-point scale, with 5 being the best/cheapest/most resistant. Grades are determined by combining two sources of information and personal opinions and knowledge. However, subjective factors

such as aesthetic features and personal preferences are not included to maintain objectivity. Keep in mind that evaluation could be biased and misinterpreted, so it is important to approach it critically and with an open mind.

	METAL			WOOD	PLASTIC
	ALUMINUM	STEEL	WROUGHT IRON	TEAK	POLYPROPYLENE
WATER/RUST RESISTANT	5	4*	3*	3*	5
FADE/SCRATCH RESISTANT	3	4*	3*	4*	3
WIND RESISTANT (WEIGHT)	3	5	5	3	3
EASY TO CLEAN	5	5	4	4	5
LONGEVITY	4	4	3	3	3
ECO-FRIENDLY	4	4	3	4	2
PRICE	4	3	3	3	5
TOTAL	28	29	24	24	26

Figure 1. Material evaluation.
*The surface of the materials was treated with coating
Data and evaluation is based on:
Patio production. (2014). How to Choose the Best Material for Outdoor Furniture. Available online from: https:/patioproduction.com
Early, J. (2001). The Ultimate Guide to Outdoor Furniture Materials. Available online from: https://vevano.com

In conclusion, the most common material choices for outdoor tables and an evaluation of their suitability for further design were presented. However, it is important to consider other factors, such as size and shape, when selecting features for an outdoor table. Outdoor tables for restaurants and cafes come in various shapes, sizes, and heights to accommodate different customer needs and preferences. The choice of table shape and size largely depends on the space available and the preferences of the establishment, but round, square, and rectangular tables are the most commonly used in outdoor dining settings (generally observed in various settings). Round tables facilitate conversation among diners, as everyone can face each other comfortably, making them particularly suitable for social settings also they are very suitable for smaller outdoor areas (Freeman, 2022). Square and rectangular tables, on the other hand, can be easily combined and connected to form larger seating arrangements or separated for smaller groups, offering greater flexibility in arranging outdoor spaces.

In terms of size of the table top, the choice depends on the number of customers a restaurant or cafe wants to accommodate at a single table. For example, a typical two-seater table has a width 60-80 cm, while a four-seater table is generally 90-120 cm wide. For round-shaped tables, they generally vary in diameter from 60 to 120 cm, and even larger for low-height/lounge tables (observed in tables in the market). Tables catering to larger groups may require a wider or longer size, but most of the times a few rectangular shaped table are combined and putted together.

In restaurants and cafes, the height of the table surface is typically depends on people sitting on chairs. For more casual settings or leisure spots, lower tables, also known as lounge tables, are designed to suit those sitting in armchairs (Smardzewski, 2015). Most commonly, average height table height is between 71 cm and 76 cm (Openshaw et Taylor, 2006). Bar-type tables typically range in height from 90 to 115 cm, while lounge area tables can be anywhere from 40 to 60 cm in height (observed in tables in the market). The illustration below (Figure 2) helps to unpack the findings on the most common types of dining setting, which include tables of varying heights and sizes. Information is based on market observation and personal evaluation.
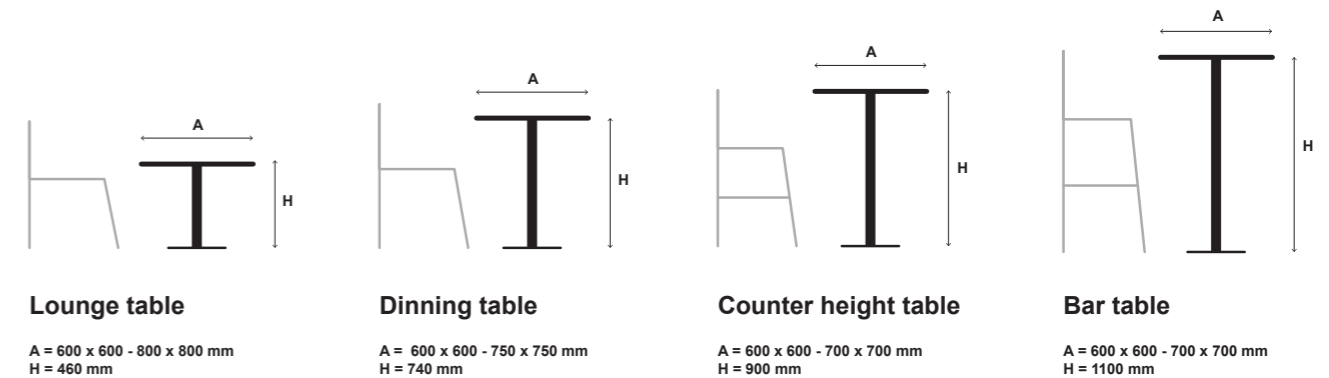

Figure 2. Different table heights.

Lounge table
A = 600 x 600 - 800 x 800 mm
H = 460 mm

Dinning table
A = 600 x 600 - 750 x 750 mm
H = 740 mm

Counter height table
A = 600 x 600 - 700 x 700 mm
H = 900 mm

Bar table
A = 600 x 600 - 700 x 700 mm
H = 1100 mm

In conclusion, the size and shape of outdoor tables for restaurants and cafes play a crucial role in determining the overall design and functionality of the space. The choice of table shape and size largely depends on the available space and the preferences of the establishment, and different shapes offer different advantages for accommodating customers and facilitating conversation. The size of the table top also varies depending on the number of customers the table needs to accommodate, and the table height is designed to suit the chairs or seating arrangements. These fundamental factors are essential in determining other design aspects, such as selecting the appropriate table bases.

2. Table bases

Given the crucial elements of outdoor tables such as materials, shapes, and dimensions, it's important to delve deeper into additional features and characteristics. Outdoor table legs, for instance, come in various designs, such as: central base legs, three-legged (tripod) or four-legged bases that coming from centre, X-shaped legs, and the traditional four-legged shape. Of course, there are many non-standard solutions for tables can come in many different shapes and materials. Each leg design offers unique features and pros and cons compared to others. For example, three-legged table base designs are known for their stability and lack of wobbling due to the three contact points with the ground. However, four-legged tables can support heavier loads. Central base leg

designs are recognised for their excellent ergonomics, as they allow for more unrestricted seating. In certain cases, two types of bases can be combined into one, such as a central base table featuring a tripod-style base at the end. There are many factors to consider before choosing the right type of table base for further design. The illustration below helps visualise the findings on the most common table base shapes and designs. The different types of table bases are compared, and their major advantages and disadvantages are presented in the chart. This information is based on market observations and personal evaluations.

Central base (pedestal)   Three-legged base (tripod)   Central four-legged base   X-shaped base   Traditional four-legged base
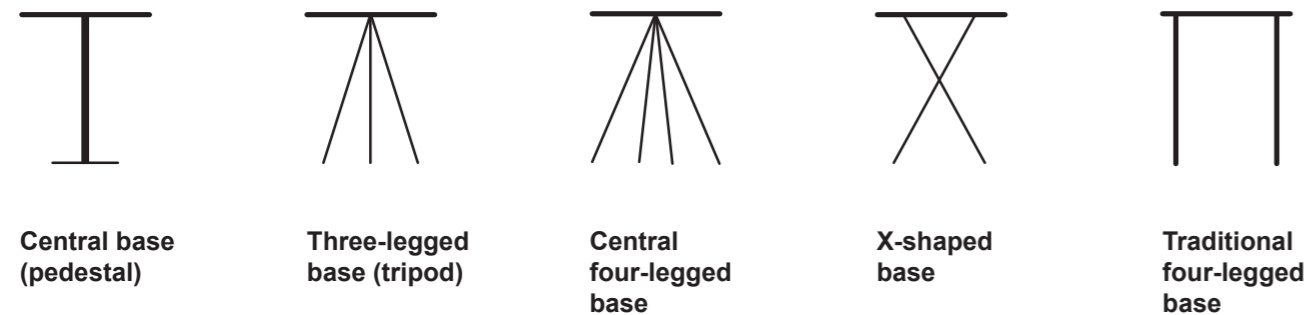
Figure 3. Different table base designs.

Central base (pedestal)

Advantages:	Disadvantages:
• More legroom: Pedestal table legs provide more legroom and space for seating, as there are no corner legs to obstruct movement or placement of chairs. • Flexible seating arrangements: Central base tables allow for more flexible seating arrangements since chairs can be placed around the table without being constrained by corner legs. • Aesthetic appeal: Pedestal tables often have an elegant and visually appealing design, making them a popular choice for interiors. • Stability: A well-designed central base can provide excellent stability, especially for round or smaller tables. • Flip-top: The mechanism of flipping a tabletop 90 degrees can be easily incorporated into the design because the base shape does not interfere with the movement of the tabletop.	• Weight distribution: Pedestal table legs might not distribute weight as evenly as other leg designs, potentially leading to instability if the tabletop is heavy or large. • Limited load capacity: Central base tables may have a lower load capacity compared to tables with four legs, which could limit the amount of weight they can support. • Less suitable for large tables: Pedestal tables might not be the best choice for large or elongated tables, as they may lack the necessary support and stability provided by multiple legs. • Potential cost: Depending on the design and materials used, pedestal table legs can be more expensive than other leg options.

Three-legged base (tripod)

Advantages:	Disadvantages:
• Stability on uneven surfaces: Tripod tables are less likely to wobble on uneven surfaces, as the three points of contact can adapt more easily to irregularities in the floor. • Simplicity of design: Three-legged tables often have a simpler design, which can make them easier and more cost-effective to manufacture and assemble. • Space-saving: Tripod tables can have a smaller footprint compared to other table designs, making them suitable for compact spaces or situations where floor space is limited. • Reduced weight: A three-legged table base typically weighs less than a four-legged base. • Lower cost: Using three legs may result in a lower cost due to the reduced amount of material used compared to a four-legged table. • Stackable: Leg bases can be nested together to save space.	• Limited load capacity: Three-legged tables may have a lower load capacity compared to tables with four legs, which could limit the amount of weight they can support. • Less stability for larger tables: While tripod tables can provide good stability for small to medium-sized tables, they may be less suitable for larger tables, as the three legs might not offer sufficient support and balance. • Potentially less legroom: Depending on the design, three-legged tables can sometimes offer less legroom than other table designs such as central base. • Limitation: Three-legged tables are well-suited for round-shaped table tops. However, for square tops, when a person sits on one side, a table leg will be positioned directly in front of them. • Flip-top: The mechanism of flipping a tabletop 90 degrees can be incorporated only if three legged base is combined with central base

Central four-legged base

Advantages:	Disadvantages:
• Aesthetic appeal: This design can create a visually appealing and unique look compared to standard four-legged tables or central base tables. • Enhanced stability: Four legs extending from the table top center can provide increased stability, particularly for larger or heavier table tops. • Greater load capacity: Four legs can generally support more weight than three-legged or central base tables, making this design suitable for heavy tabletops or items. • Even weight distribution: The configuration of the legs can evenly distribute the weight of the table top, reducing the likelihood of warping or sagging. • Stackable: Leg bases can be nested together to save space. • Flexibility: This base can be used with various table shapes and sizes, including round, rectangular, and square tables.	• Reduced legroom: This design may result in less legroom for those seated around the table, as the legs converge towards the center, potentially causing discomfort or obstructing movement. • Limited seating flexibility: Chairs may need to be placed further apart or in specific positions to avoid the table legs, reducing seating flexibility. • Complex construction: The design of four-legged table legs extending from the table top center can be more complex than traditional four-legged or central base designs, potentially increasing manufacturing and assembly time and costs. • Flip-top: The mechanism of flipping a tabletop 90 degrees can be incorporated only if three legged base is combined with central base • Stability: Wobbling can occur if the table is placed on an uneven surface.

X-shaped base

Advantages:	Disadvantages:
• Enhanced stability: X-shaped legs provide excellent stability due to their wide base and multiple points of contact with the ground, making them suitable for larger or heavier tables. • Space-saving: Foldable X-shaped base legs can be easily stored in small spaces, making them an ideal choice for those with limited storage options. • Portability: Foldable X-shaped base legs can be easily transported to different locations, which is beneficial for those who need to move their table frequently.	• Limited seating flexibility: Depending on the design and size of the X-shaped base legs, chairs may need to be placed further apart or in specific positions to avoid the legs, reducing seating flexibility and potentially making it difficult to accommodate additional guests. • Complexity of design: X-shaped base legs can be more complex than standard four-legged or central base designs, potentially increasing manufacturing and assembly time and costs. • Potential instability on uneven surfaces: As with any table base design, wobbling can occur if the table is placed on an uneven surface, potentially causing instability with an X-shaped base. • Cost: Depending on the materials used and complexity of the design, X-shaped base legs can be more expensive than other leg options.

Traditional four-legged base

Advantages:	Disadvantages:
• Stability: Four-legged tables offer excellent stability due to the four points of contact with the ground, making them suitable for larger or heavier table tops. • Load capacity: Four-legged tables can generally support more weight than other leg designs, which is beneficial for those needing a table for heavy items or equipment. • Versatility: Four-legged tables can be used with various table top shapes and sizes, including rectangular, square, and round tops. • Seating flexibility: Four-legged tables provide more seating flexibility, as chairs can be placed anywhere around the table without the legs getting in the way. • Simplicity: Non-complex and fast manufacturing and assembly.	• Reduced legroom: The four legs of the table can reduce legroom and space for seating, which can be uncomfortable for some users. • Space requirement: Four-legged tables can take up more space than other leg designs, which can be a concern for those with limited floor space. • Aesthetic considerations: The design of four-legged tables may not be as visually appealing or unique compared to other leg designs, depending on personal taste and the overall style of the interior. • Stability: Four-legged tables can be more prone to wobbling on uneven surfaces, especially if one or more of the legs is not level.

Figure 4. Different table base design evaluation.

In summary, this chapter presented the fundamental elements to consider when designing an outdoor table. However, given the numerous properties and possibilities for table design, the upcoming chapters will explore additional details using different methodologies. This is because categorising outdoor table designs can be challenging as they become more complex. To ensure a comprehensive understanding of design considerations, it is essential to observe the context and stakeholders involved in outdoor table use, including restaurant employees, government regulations and recommendations.

MUNICIPAL GUIDELINES

In this chapter, the focus will be on exploring the guidelines, recommendations, and regulations set by city councils and governments for businesses developing outdoor spaces, particularly for restaurants and cafes. As urban areas become denser, it becomes crucial to design commercial furniture that effectively utilises these spaces while complying to local requirements.

As the future research will be conducted in Malmö, Sweden, and the future development and market of the planned outdoor table will take place in Vilnius, Lithuania, this chapter will focus on the specific requirements for outdoor areas in these two cities. The regulations and guidelines of both Malmö and Vilnius will be presented below, providing insights into the unique local requirements that businesses must consider when arranging and picking outdoor furniture solutions.

Overview of findings in: Property and street office. (2016, revised in 2022) Guidelines for outdoor dining in Malmö. Original title: *Fastighets- och gatukontoret. Riktlinjer för uteserveringar i Malmö*

Accordance with government guidelines for outdoor cafes and restaurants, the focus on furniture, particularly tables, plays a significant role in ensuring accessibility and integration into the urban environment. The City of Malmö requires outdoor seating to be open, airy, flexible, and not overfurnished, enabling ease of use for all patrons. Placing furniture directly on the ground, with serving surfaces at ground level, ensures that the outdoor seating area complements the urban setting. For uneven ground, adjustable tables and chairs can be employed.

Furniture must be durable, of high quality, and suitable for outdoor use while fitting harmoniously into the surrounding urban environment. Neutral colors are preferred for furniture, allowing rugs and other details to provide color accents. Tables accessible to everyone, including wheelchair users, must have a minimum space of 0.80 meters between table legs or a 0.60-meter protrusion on the short side, and a height of 0.70-0.85 meters. Crossbars under the table should be avoided as they may obstruct wheelchair access. Additionally, tables, chairs, and benches should be easy to move and placed loosely on the ground. White and aluminum tables are discouraged, as they can create glare, particularly for visually impaired individuals.

Accessible seating must cater to all patrons, with chairs both with and without armrests available. Heavy furniture, combined bench-table setups, or small pillar tables may create difficulties for people with mobility impairments and should be avoided in outdoor dining areas. By following these guidelines, cafes and restaurants can create inclusive, welcoming, and functional outdoor spaces for all visitors.

Overview of findings in: Vilnius city municipality. Requirements for outdoor cafes in Vilnius. Original title: *Vilniaus miesto savivaldybė. Reikalavimai lauko kavinėms Vilniuje.*

Outdoor spaces are set up temporarily and must not obstruct traffic or access to public spaces. When dismantling the equipment, the area must be left tidy, with clean surfaces and any greenery restored.

In summary, the outdoor equipment (furniture, coverings, barriers, etc.) in Vilnius should be moderate, compatible with the surroundings (building and public city space architecture), and comply with the Old Town management recommendations. The outdoor equipment should have 1-7 colors, with recommended colors being light sand, dark blue, dark red, dark green, brown, gray, and black. Furniture should be easily portable and made using only high-quality, durable materials. Furniture must be designed for outdoor use and installed without attaching to the ground, other surfaces, or building facades. It is recommended to use openwork furniture (such as made from wrought iron) and easily portable furniture. When the outdoor café is not in operation, it is mandatory to ensure a tidy appearance of the furniture (nested together).

To conclude, the following list serves as a guide for future outdoor table design, addressing the requirements set forth by one of the research's key stakeholders - **municipal authorities:**

1. Ensure temporary setup without obstructing traffic or public access. Prioritise accessibility and integration into the urban environment.
2. Use moderate and compatible designs that align with surroundings and architectural context.
3. Choose from a neutral color palette and avoid mixing too many colors.
4. Opt for easily portable, high-quality, and durable materials.
5. Avoid attaching furniture to the ground, surfaces, or building facades.
6. Utilise openwork and easily portable furniture.
7. Maintain a tidy appearance of furniture when not in use.
8. Use adjustable tables and chairs for uneven ground.
9. Ensure wheelchair accessibility with appropriate table dimensions and spacing.
10. Avoid crossbars under tables.
11. Avoid heavy furniture or combined bench-table setups that may hinder accessibility.

PERSONAL OBSERVATIONS

Figure 5. Various pictures of outdoor tables in Lund, Sweden.

While observing outdoor table situation in Lund, Sweden, I identified some issues that piqued my interest in this field. Worth mentioning, the observations and photographs were taken during the cold season, focusing on outdoor table storage. The locking situation appeared problematic; most tables in Lund and other cities utilised a system where a long chain or wire wrapped around the tables. This setup was often aesthetically unappealing due to poor wrapping, with loose chain ends lying on the ground. Additionally, this arrangement seemed insecure, as it was sometimes possible to disassemble the tables.

The disorderly collection of tables also contributed to an unattractive appearance. It appeared that restaurant employees faced difficulties in nesting and locking the tables, sometimes stacking them on top of each other, even when heavy and cumbersome to lift.

Another issue observed was uneven table tops when multiple square tables were placed together to create a larger surface. This problem was likely due to uneven ground or differences in table heights. Upon further investigation, I discovered that the height adjustments for table legs were often dirty or even broken. In some instances, the adjustment screw was fully unscrewed, leaving the table leg hanging in the air. Table leg surfaces were scratched, and paint or other surface treatments were damaged, especially in areas where people frequently placed their feet.

In conclusion, the design and management of these outdoor tables could be significantly improved. By addressing these issues, it is possible to help employees in moving, nesting, and locking tables more efficiently while also enhancing aesthetics and durability for all users and passersby. To coclude, these improvements would contribute to a more inviting and functional outdoor dining experience.

The list below indicates design goals for future outdoor table development based on my **personal** primary observations conducted in Lund, Sweden:

1. Secure locking system: Develop an effective and aesthetically pleasing locking mechanism that ensures the tables remain safe without compromising their appearance.
2. Easy nesting and arrangement: Design table that is easy to stack, arrange, and move, making it more convenient for restaurant staff to handle it.
3. Adjustability for stability: Incorporate adjustable table legs that are simple to use, clean, and maintain, allowing for better adaptability to uneven ground.
4. Durable materials and finishes: Utilize high-quality materials and surface treatments that can withstand outdoor elements and resist wear from daily use.
5. Aesthetically appealing: Design table that enhances the overall appearance of outdoor dining spaces, contributing to a more inviting atmosphere.

QUALITATIVE INTERVIEWS

To gain a deeper understanding of the issues people face while interacting with outdoor tables, I decided to ask those directly involved for their opinions. The selected stakeholder group consisted of restaurant employers (80% of people interviewed) and managers. The interviews were conducted in Malmö, Sweden, in early April, when most outdoor restaurants and cafes had opened their outdoor areas. Ten interviews were facilitated through a survey, with full case studies available in Appendix No. 1. It comprises 10 qualitative surveys from various locations, accompanied by personal notes. However, the key findings will be presented here. Some observations include positive aspects of the furniture that particular restaurants have, which their employees appreciate. Other design recommendations will address areas for improvement, as compared to existing tables that could be enhanced according to restaurant employees' feedback. Overall, the interviews revealed problems that personal observation couldn't, significantly impacting the further development of the table design.

List of features (Figure 6) to incorporate based on **restaurant and cafe employees** feedback from interviews:

Case 1.

Consider designing outdoor tables with more weight to prevent them from being blown over by the wind.

Case 2.

Address wobbling issues caused by uneven ground and heavy tables. Design table tops without gaps to prevent items from falling through.

Case 3.

Incorporate a feature that allows table tops to be flipped 90 degrees for easy storage. Consider installing a locking system to secure tables to the building. Address potential paint damage due to rocks on the ground.

Case 4.

Design lightweight tables for easy movement and storage, reducing the time and effort required by employees.

Case 5.

Employ stabilizing table technology, such as "Stable Tables," for increased customer satisfaction.

Case 6.

Incorporate features that simplify the locking process, such as holes underneath table tops. Ensure table stability on uneven ground.

Case 7.

Consider ways to protect tables from vandalism and paint damage when stored outdoors.

Case 8.

Design tables with features that enable secure outdoor storage, especially for heavier tables and round designs.

Case 9.

Investigate unique table designs that may not require locking systems, while still ensuring security.

Case 10.

Ensure employees are aware of all table features, such as lifting the table top 90 degrees for storage. Maintain satisfaction with stable table designs.

Figure 6. Findings of the interviews conducted in Malmo, Sweden.

SURVEY

I conducted a survey about outdoor tables and received 31 responses. The majority of respondents were aged 22-30, including a mix of interior designers and people not involved in design field. The survey's findings may be biased due to the wording of the questions. Furthermore, not every aspect or table feature was covered, as the goal was to keep the survey short with only 10 easy and interactive questions. In this chapter, only the first eight questions will be discussed, as the last two questions asked about the final table design, which will be presented in future chapters. While the key findings will be discussed here, all the data can be found in Appendix No. 2.

In the survey on outdoor tables, respondents shared their preferences and experiences in various settings. The majority (77%) preferred sitting outside in cafes and bakeries when the weather is good, while 22% said it depended on whether the outdoor area was appealing. For the fine dining, the preference shifted: only 26% preferred sitting outside, while 58% said their choice depended on the outdoor area's suitability. This difference in preference could be due to the more relaxed and informal atmosphere associated with cafes and bakeries, when fine dining establishments may have a more formal and controlled environment some people prefer indoors.

Design and comfort were important factors, with 71% preferring well-designed and comfortable furniture and only 30% stated that they don't care about design unless is very uncomfortable. This finding suggests that people value their experience and surroundings when dining out, and a pleasant environment can have a significant impact on their overall satisfaction. The emphasis on design and comfort also indicates that people may be willing to pay a premium for establishments that invest in high-quality furniture.

Respondents faced several issues with outdoor tables, including instability (90%), lack of legroom (67%), table size (67%), and cleanliness (80%). This overwhelming concern for stability implies that addressing this issue should be a top priority for future designing.

Survey then asked what people want from outdoor tables, so preferred features was also was stability (90%), aesthetic design (39%), durability and longevity (58%), easy movability (48%), foldability for storage (52%), and easy cleaning (52%). The least important feature was the ability to choose various colors or materials (3%). It is worth mentioning that respondents later indicated a preference for medium-bright colors for outdoor tables, compared to dark colors or very bright and light ones. These preferences suggest that functionality, practicality, and aesthetics are the main factors that contribute to a positive outdoor dining experience. The lower priority on customisable colors or materials may indicate that most people prioritise the overall experience and usability over personalisation when it comes to outdoor furniture.

INITIAL DESIGN BRIEF

Develop an improved design outdoor table primarily focusing on the needs of <u>restaurant and cafe employees</u> by setting these goals:

- **Compact and aesthetic storage of tables when not in use;**
- **Easy and aesthetic locking system while enhancing the convenience;**
- **Cleaner and more user-friendly table leg adjustment for uneven ground;**
- **Incorporated feature for connecting table tops together to create an even surface.**

Note: this initial design brief was established following the first personal observations (see page 25). At that time, research was being conducted simultaneously with the beginning of the ideation process.

IDEATION PROCESS

Existing examples of features and analogs:

Goal No. 1:

Compact and aesthetic storage of tables when not in use.

What features can be incorporated:

- **Flip-top solution:** design feature where the table top can be flipped or rotated 90 degrees, usually into a vertical position, when not in use. Incorporating this feature into the design offers several benefits. Firstly, it enables space-saving, as tables can be stacked or placed closer together, making it easier to store multiple tables in a limited space. Secondly, it facilitates easy cleaning, as flipping the table top up provides better access to the entire surface and the surrounding area. Additionally, a flipped table top can provide a visually appealing and uniform appearance when tables are not in use, creating a more organised and attractive outdoor space. This design feature can also improve security, as flipped table tops make it more difficult for potential thieves to steal the tables, given that they become harder to move and transport. Lastly, in some designs, flipping the table top can help protect the table surface from rain, snow, or other elements, potentially prolonging the table's lifespan.

- **Foldable legs:** design feature that allows the legs to be collapsed when the table is not in use, making it easier to store and transport, while also saving space and enhancing the overall convenience

- **Stacking sideways:** feature in outdoor tables enables them to be stacked horizontally, significantly saving storage space and simplifying transportation. This design solution is particularly beneficial for establishments with limited storage areas or those that have a large number of tables to manage. By stacking tables sideways, businesses can maintain a neat and organized appearance, making the cleaning and maintenance process more efficient. Additionally, stacking tables offers some protection against weather elements such as rain, wind, and snow, potentially extending the tables' lifespan and enhancing their durability. Also, it helps to incorporate more efficient and easier locking.
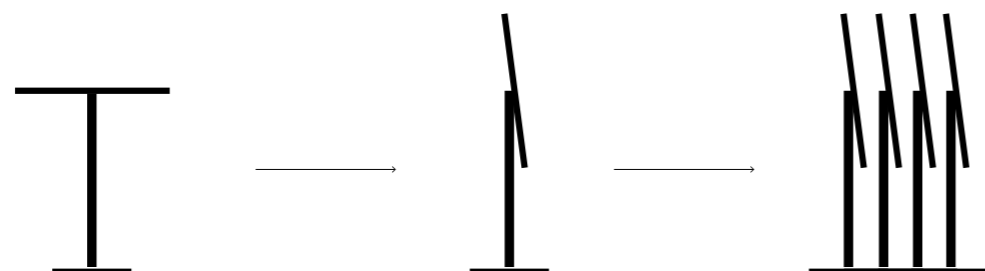
Figure 9. Origami. Expandfurniture

Figure 7. Patrick Norguet. Poule. Kristalia

Figure 8. ASKHOLMEN. Ikea

Figure 10. 3-Pod Table. Giancarlo Bisaglia. Infiniti

Goal No. 2:

Easy and aesthetic locking system while enhancing the convenience.

What features can be incorporated:

- **Hole to put a locking chain:** feature in outdoor tables that enhances security and simplifies table management. By incorporating a designated hole in the table design, restaurants and cafes can easily secure their tables with a locking chain, protecting them from theft and potential damage. Additionally, the locking chain hole allows for efficient organization and storage, as tables can be connected and locked together, making it easier and faster to manage and maintain outdoor spaces. Futhermore, it can become much more aesthetically pleasing compared to freehand locking.

- **Caster wheels:** Incorporating wheels attached to the table legs is a valuable feature for outdoor tables, as it significantly eases the process of moving them. This is particularly beneficial when the tables are heavier, reducing the physical strain on employees. By adding wheels, restaurants and cafes can improve the efficiency and convenience of setting up and rearranging their outdoor spaces while maintaining a comfortable and inviting atmosphere. If wheels are incorporated, the locking system becomes easier, as nesting tables in one place is more convenient. This streamlined approach not only improves the organization of outdoor spaces but also enhances security for the furniture.
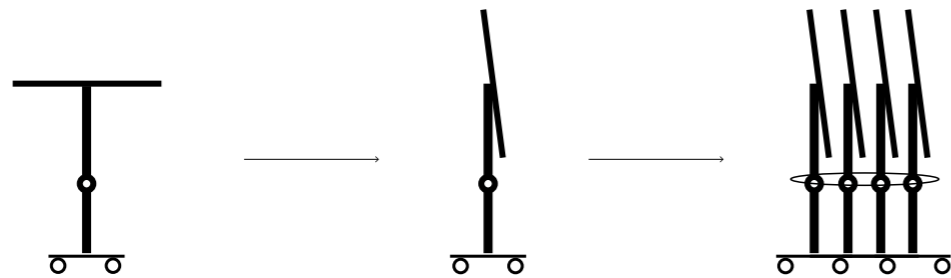
- **Integrated locking:** When one table is placed next to another, they automatically lock together, eliminating the need for chains. Employees only need to lock the last table in the series, simplifying the process and saving time. This innovative approach not only streamlines the locking procedure but also creates a more visually appealing and cohesive outdoor space

Existing examples of features and analogs:

Figure 11. Centro Ricerche. 473KH. Emu

Figure 12. Roll table.Tom Dixon

Figure 13. Acer Design. RBM u-Connect. Flokk

Goals No. 3:

Cleaner and more user-friendly table leg adjustment for uneven ground; Same height table tops when multiple tables are placed side by side.

What features can be incorporated:

- **Leg adjustment from the top of the leg:** This feature can greatly improve the outdoor dining experience by providing a cleaner and more user-friendly solution. This can be achieved by designing a simple and intuitive mechanism within the table legs that allows for quick and efficient adaptation to the terrain without the need for additional tools or materials. One way to accomplish this could be by preventing dirt from entering the area where people need to touch the threading mechanism. Another approach would be to design a leveling knob on top of the leg, making adjustments more accessible and convenient. This would not only prevent wobbling but also help create an even surface when multiple tables are placed side by side

- **Self-levelling mechanism:** This innovative feature can significantly enhance the outdoor dining experience by automatically adapting the table legs to uneven terrain. It eliminates the need for manual adjustments, providing a hassle-free and user-friendly solution for both employees and customers.

- **Table top connector:** connector could a valuable feature that can greatly improve the outdoor dining experience by providing a seamless and continuous surface when multiple tables are placed side by side. This can be achieved by designing a simple and intuitive mechanism that allows for quick and efficient connection between table tops without the need for additional tools or materials. The design of this feature could be inspired by office table designs, where similar mechanisms are popularly employed.
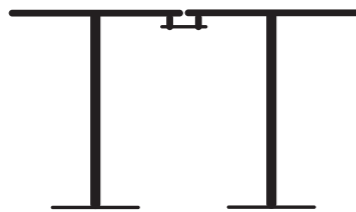
Existing examples of features and analogs:

Figure 14. StableTable

Figure 16. BPF Components and accessories. Table top connector

Figure 16. NoRock table

FIRST SKETCHES

IDEA EVALUATION

1. Initially, the table concept featured foldable legs, which appeared to be a convenient solution for saving space during storage. However, such a design introduces a level of complexity, making the mechanism more difficult to manufacture, costlier, and potentially less capable of supporting heavier weights. Additionally, in most cases, the table would be unable to stand independently and would need to lean on something. This idea was eventually discarded and replaced with the understanding that three-legged or four-legged table bases can stand alone while also nesting within one another.

2. It was understood that incorporating flip-top table designs can help save space and enhance the longevity of the table top's aesthetic appearance. However, some limitations related to the table base design arose with this solution. It became clear that if a three or four-legged table was chosen, the legs should originate from the table top's centre, as this would prevent interference with the table tops when flipped.

3. Overall, it was understood that nesting tables as closely as possible by stacking them side by side is a very efficient and effective solution for addressing the issues observed, that helps saving space but also helps for convenient locking.

4. Considering the previously mentioned factors, incorporating a hole for convenient and aesthetic locking seemed like a good idea. It was also understood that it could be not just a hole, but more like a loop shaped element.

5. Caster wheels initially seemed like a reasonable idea for easily moving the table. However, after discussing with a restaurant employee, it appeared that a lighter table would be a better solution, as the moving distance in most cases is not very long, and there's no need for additional features. Furthermore, adding wheels could potentially compromise the table's stability.

6. The integrated locking feature was ultimately dismissed due to the complexity of mechanism and usability.

7. The concept of user-friendly and convenient leg adjustment for adapting to uneven surfaces became a highly discussed and essential feature to incorporate into the table design. It became clear that the area where users interact with this feature should be higher on the leg to avoid interference with people's feet. Additionally, it was determined that the thread should be concealed for a few reasons. First, people might perceive visible threads as a potential weak point in the table's ability to support heavier weights. Second, concealing the thread protects it from environmental elements such as sand and water. Furthermore, this feature could serve as a primary design element in the table, both in terms of its main function and its aesthetic appeal.

8. The decision was made to exclude the table connector feature from the design due to the realisation that it wasn't considered a highly desirable function by users. It was deemed not worthwhile to spend time figuring out the design of this element

to make it both highly functional in terms of how well the connector can hold two table tops together, as well as easy and quick to use.

9. To ensure that the table top can be flipped, the base design of the table needed to be centered at the top and extend towards the bottom to allow the table to stand on its own. This meant that a three or four-legged base could be chosen. However, the desire to incorporate various shapes of table tops, whether square or round, meant that a three-legged design would not be ergonomic. This is because one of the three legs would face directly towards the person sitting on that side of a square table. Therefore, it was concluded that a four-legged central base design would be the best option.

10. During the research phase of the design process, the self-leveling/adjustable table base was a challenging obstacle to consider. While conducting surveys and observations, the brand "StableTable" caught my attention due to its popularity in the areas where the research was conducted. The brand and its mechanism for self-stabilizing tables were founded in Sweden, and roughly 30 percent of the observed tables in Malmo, Lund, and Copenhagen were from "StableTable". The first idea was to contact the brand and propose a collaboration or to use their mechanism for the design proposal. It is important to note that this self-leveling mechanism is patented. However, since the brand did not respond, further investigation was necessary to determine any possible disadvantages of the mechanism and table bases. Firstly, the table bases from this brand seemed to prioritise function over aesthetic value, with their different base types designed in a "classical" style that does not meet the needs of modern design. Secondly, the manufacturing quality, at least aesthetically, was poor, as the different parts did not fit together well, and rough welding lines were visible. Moreover, the height adjustment range of the StableTable mechanism is limited to only 25 millimetres, which may not be sufficient in certain situations. Additionally, the table bases were relatively heavy and costly. Despite these drawbacks, the product inspired me to focus on adjustable leg height as a design feature, as it provided evidence that the market has a demand for this feature.

Figure 17. StableTable

TESTING

As mentioned earlier, due to the high demand and customers' needs, the decision was made to focus on the table leg adjustment/leveling feature. Making this feature a main aspect of my table design was also a choice that can bring a unique aesthetic and enjoyable interactive element to the table. However, designing this feature was not a simple task. I aimed to create a simple yet effective solution. For this purpose, I decided to go with the straightforward "adjustment by rotating the thread" mechanism, similar to what exists in many tables, but with enhancements for improved ergonomics. The primary goals were to ensure that these parts were situated in areas where dirt from the ground and people's shoes could reach them and to make them easily accessible and user-friendly for turning. To validate the legitimacy of my design, I conducted a quick test/mockup in a metal workshop at IKDC.

Figure 18. Mockup of levelling leg mechanism

For this test, a 100 millimetre long M12 thread was used along with an internally threaded pipe. This quick and basic prototype showed that the mechanism works as intended. However, some areas for improvement were identified. It was necessary to protect the thread from dust and dirt that could prevent it from rotating. To achieve this, in the final mechanism design, an extra layer of pipe was added to keep the thread hidden and shielded from outside.

POSITIONING

To further develop my design for the outdoor table, it was necessary to determine where it should stand in comparison to other market analogues. Therefore, I focused on two key factors: price and aesthetic value, considering how generic or unique and modern the design is. To make a comparison, I chose several tables based on different price ranges and aesthetic designs. It is worth noting that the information provided in the table below is a personal evaluation and may be subjective. Although it is also based on how the brands are presenting and positioning their products. List of names and brands of the analogues tables are provided in appendix No.3

The perfect aimed positioning in the market was clear: to design a table with aesthetically pleasant /unique design for the price of the less aesthetic tables. This goal poses a challenge because high-quality materials, durable surface finishes, and well-engineered solutions usually come with higher manufacturing costs. To address this, the decision was made to use a single material, specifically metal, in order to create a stable, reliable, durable, aesthetically pleasing, and cost-effective table. Furthermore, it was important to standardise the manufacturing processes and design them for easy production using simple tools. More advanced methods like CNC milling were rejected in favour of simplicity. Additionally, it was clear that the components should be standardised in size to allow for the purchase of pre-made parts, such as standard diameter steel pipes.

Additionally, it was understood that there are comparable tables already available in the market, which are highly affordable and have reasonably good aesthetic designs (Figure 17). It became clear that competing with these tables would be challenging. In order to surpass such competition, the decision was made to focus on designing my table as close to human needs as possible. By making the table with a distinct character and ensuring it strongly resonates with people, the aim is to make it truly stand out. Furthermore, incorporating additional features and manufacturing quality, as previously presented, is intended to enhance its uniqueness in comparison to these inexpensive yet visually appealing tables.

Figure 19. Coffee table. Aliexpress
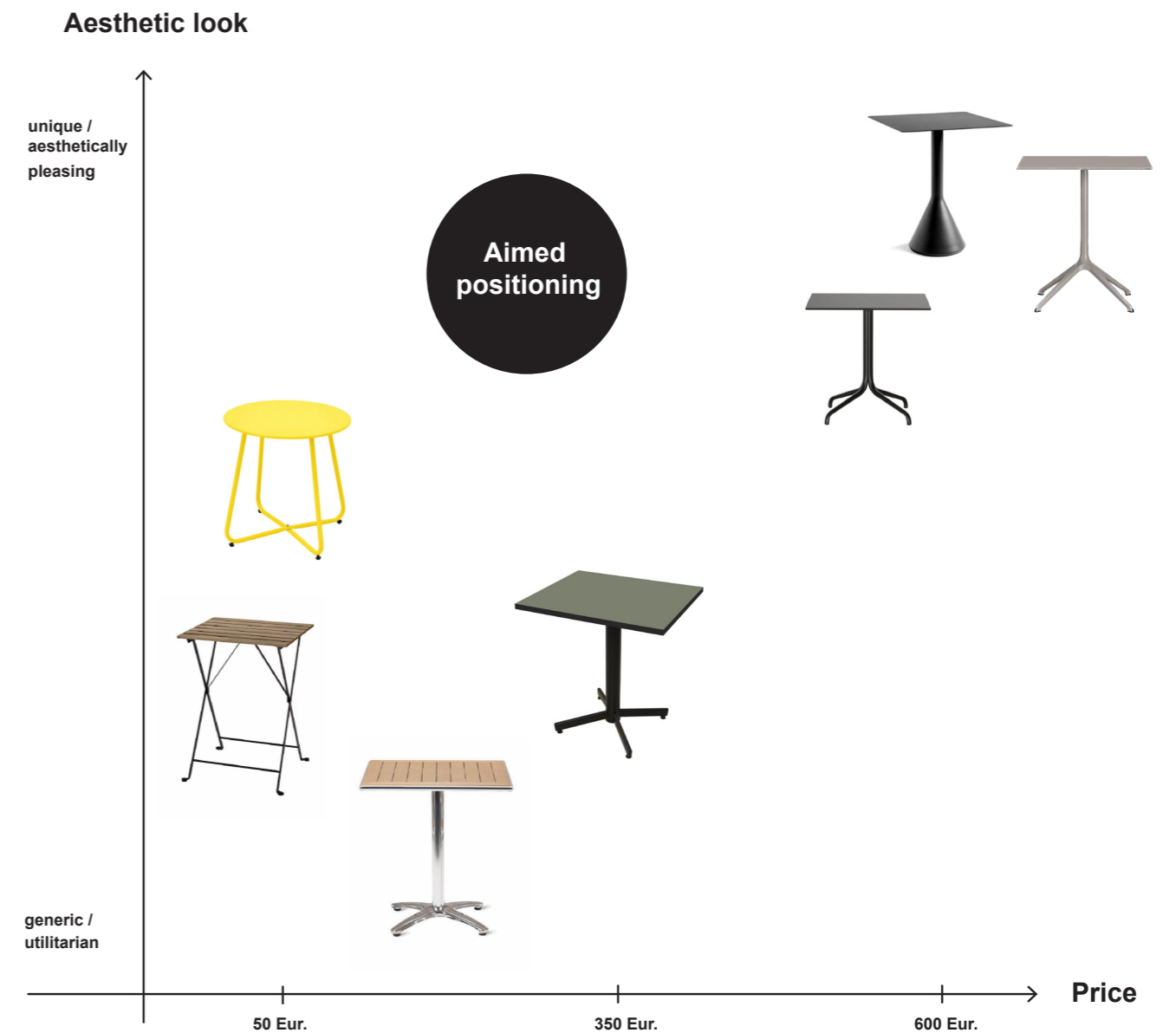
Figure 20. Analogues analysis in the market

FINAL DESIGN BRIEF

Develop an improved design outdoor table focusing on the needs of <u>all related stakeholders</u>, by setting these goals:

- Stable and reliable table that functions well and looks aesthetically pleasant;
- Clean and user-friendly table leg adjustment for uneven ground;
- Compact and aesthetic storage of tables when not in use;
- Easy and simple locking;
- Safe and ergonomic placement of the hook for hanging personal items;
- Easy to move, but difficult to tip over.

Note: This final design brief was established by updating the initial design brief based on the findings from the conducted survey and interviews.

DESIGN FEATURES

650 mm
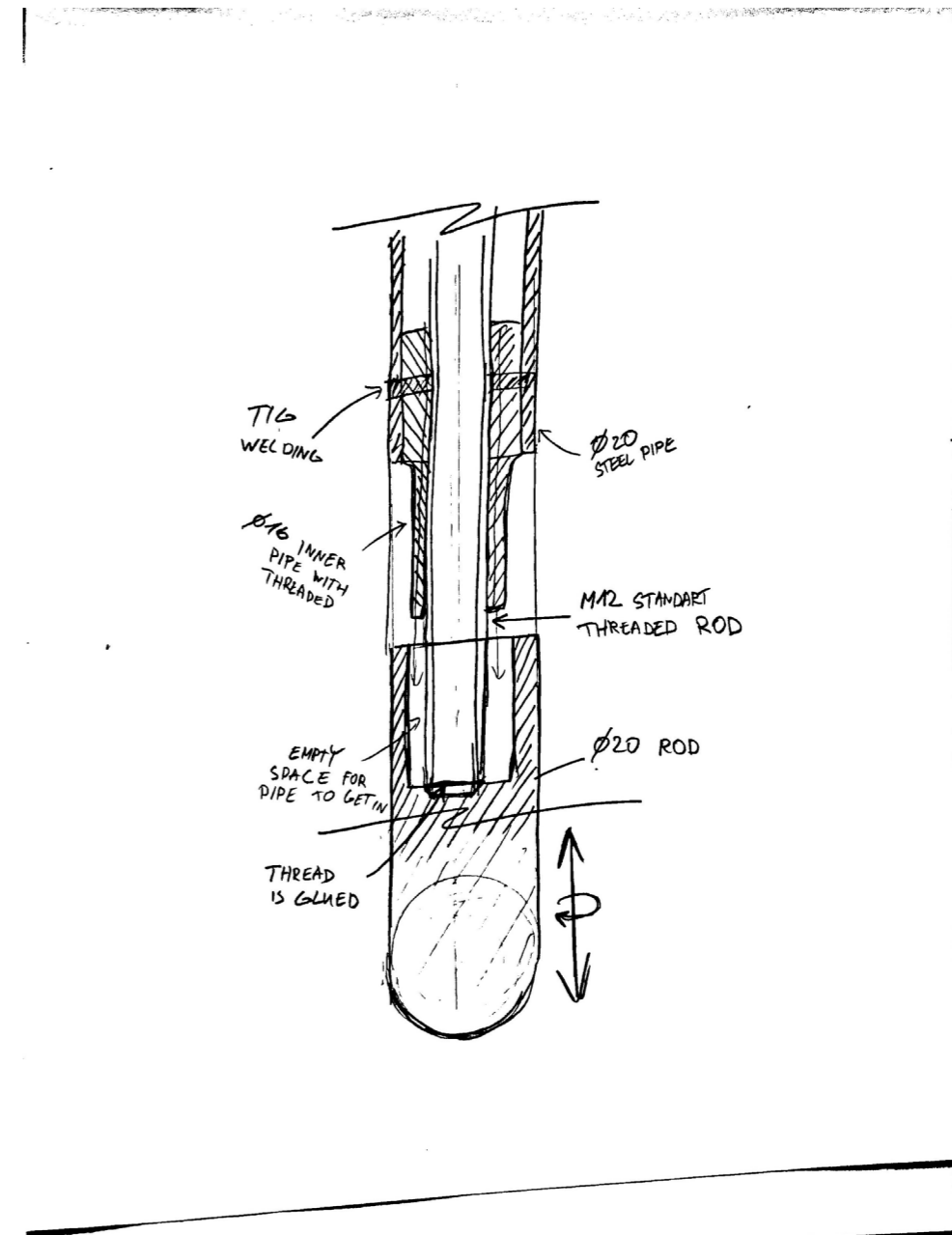
730 mm

Size

The height is set at 730 mm and can be adjusted up to an additional 35 mm. When the table top is flipped, the height becomes 1060 mm.
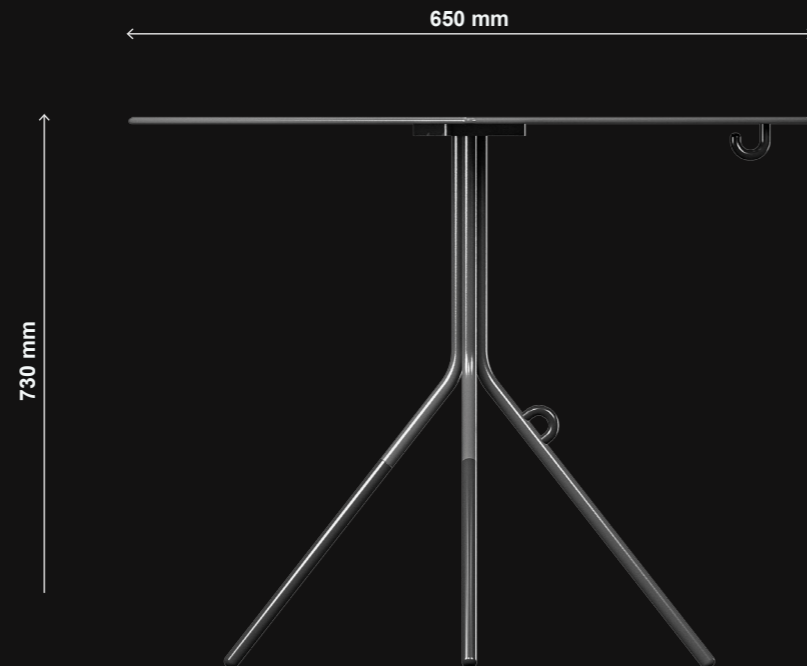
Shape

The table top can rotate 90 degrees for side-by-side stacking, providing a secure, aesthetically pleasing, and space-saving solution.

The four-legged central base enables easy stacking, and the 45-degree angled legs prevent foot resting, keeping the metal's clean, elongated appearance intact.
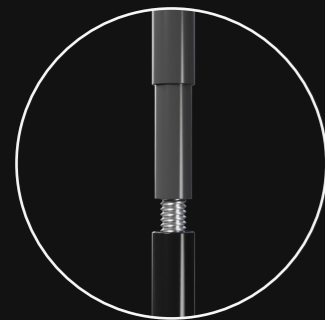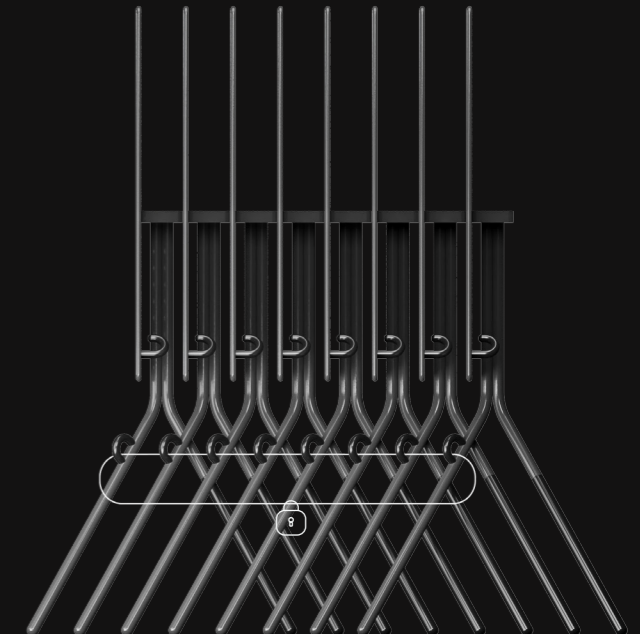
Levelling feature

Three out of four table legs are equipped with a levelling function.By rotating the leg base and unscrewing the threaded steel rod, it can be extended up to 35mm in a vertical direction.
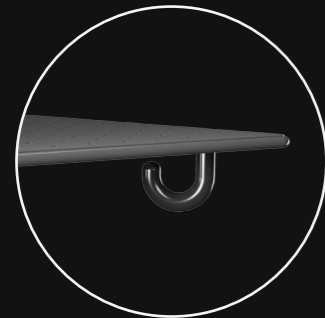
Hook

Located at one corner of the table top, the hook is specifically designed for securely holding personal items. Its open space faces the table's center, rather than the outside, to enhance security. This orientation makes it more difficult to unhook items, providing an added layer of protection

Locking

A steel loop is welded to the stable leg without the leveling feature, designed for easy and secure locking. This provides a neater appearance when locked and requires less locking chain / wire. The loop is positioned at an ergonomic height for convenient access.

Materials

The table top is made from a perforated 1mm steel sheet, with legs constructed from 20mm diameter bent steel pipes, and bases made from steel rods. All other details are also crafted from steel. Each part is powder-coated with a two-color combination.

The base model for the square table top measures 650 x 650 mm, while the round version has a diameter of 650 mm. Larger table tops, up to 800 x 800 mm, can also be accommodated. Additionally, the table top material can be changed to match the desired aesthetic.
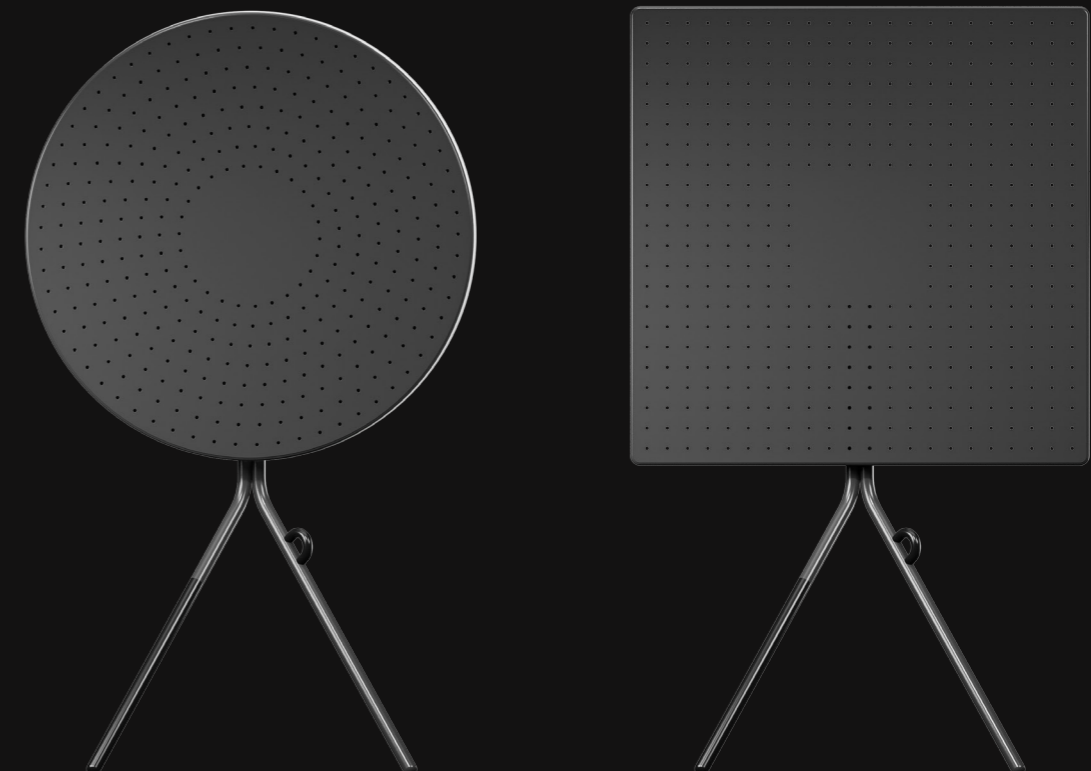
TABLE
COLORS

This powder-coated table features a unique two-color combination, where the darker or more saturated color emphasizes its functional aspects, such as table leg height adjustments. This not only indicates the table's adaptability in case of wobbliness but also serves as a visual guide for the user.

With a selection of five base color combinations, this table can cater to different interior or exterior design preferences and suit various branding needs for restaurants and cafes. The chosen color combinations have been carefully selected based on people's desirability and in compliance with municipal guidelines. This ensures that the table can seamlessly blend into a wide range of environments while providing both functionality and aesthetic appeal.

RAL 1006 and 2000

Infuse your space with a burst of energy and warmth through a vibrant yellow colorway, perfect for environments where positivity and cheerfulness are the heart and soul.

RAL 9016 and 9018

Pure tranquility and minimalist elegance with this discreet color palette, perfect for serene spaces where cleanliness and harmony reign supreme.

RAL 2022 and 3022

Ignite passion and create a dynamic atmosphere with a striking orange and red colorway, ideal for settings where boldness and confidence take center stage.

RAL 7021 and 9005

Embrace the sophistication and timeless allure of this sleek black colorway, ideal for spaces where bold statements and contemporary elegance effortlessly coexist.

RAL 7021 and 9005

Immerse yourself in the soothing embrace of nature with a lush forest green colorway, designed for spaces where tranquility and organic beauty are cherished.

FLIP-TOP
MECHANISM

The intention behind having a foldable table top appeared from a simple reason: to save space when the tables are not in use. The initial plan was to utilize existing pre-made parts that could be purchased online as standalone mechanisms. However, this idea was discarded for several reasons. Firstly, most of the mechanisms available were manufactured overseas, and I deemed this not only unsustainable but also unfavorable in terms of maintaining manufacturing independence. Secondly, the majority of these mechanisms were made from plastic or aluminum, which did not align with the steel construction of my table design. Lastly, aesthetics played a role. Since the mechanism would be visible when the table top is folded, I desired a consistent aesthetic that harmonized with the rest of the table components.

For these reasons, I designed the folding mechanism myself. It is a simple, shaft-based mechanism that allows the table top to lock in place when the knob is rotated 90 degrees. Additionally, the cross-section metal part should include holes to allow for the attachment of different material table tops, if required.

DESIGN EVALUATION

This outdoor table has been designed with the intention of deviating from the generic and uninteresting designs commonly seen during observation and research. The aim was to infuse "soul" into this table while creating a modern and familiar product that complements outdoor dining experiences. The use of positive shapes and colors enhances the pleasure of customers in the hospitality business.

The goal was deemed successful based on a survey that analysed customer preferences in terms of aesthetics. The full survey can be found in Appendix No. 2. The last three questions focused on color preferences, with three options provided: dark colors (black, dark brown, dark grey, etc.), medium bright and intense colors (green, dark blue, earth colors, etc.), and bright and light colors such as yellow, red, and bright blue. The majority (65%) of respondents preferred medium bright colors, followed by 39% favoring dark colors, and only 7% choosing bright colors. Based on these results, the selected base model colorways were chosen.

Recognising a need for more than just monochrome options, three additional colors described as bright were added to the selection. Yellow, red, and green colorways were chosen, but with a more natural and less saturated appearance to avoid being overly bright.

Figure 21. Color choice

Discussing customer opinions, the visualisation of this table was presented alongside four different tables. Participants were then asked to pick their favourite in terms of: "Which outdoor table do you find the most aesthetically beautiful?" The four other tables were the same ones used in the positioning chart presented earlier (some considered generic/unattractive designs and others seen as unique and aesthetically pleasing). Surprisingly, this table emerged as the top choice, garnering 43 percent of the votes. It is important to note that the interviewees were not aware that this table was designed by me, so their answers were presumably unbiased.

What was even more pleasantly surprising was the response to another question, which asked: "Which outdoor table would you choose for your private outdoor area, such as a terrace or balcony?" This table was also the favourite. Although participants in the survey were not aware of the pricing, it is worth mentioning that tables number 4 and 5 were almost double the price of the one predicted for this table. This further highlights the table's appeal, considering its aesthetics and affordability compared to other options. This outcome serves as evidence that, at least aesthetically, people see this table as a suitable choice for both public outdoor cafes and restaurants, as well as their private outdoor spaces.

Pictures of the tables used in these questions:
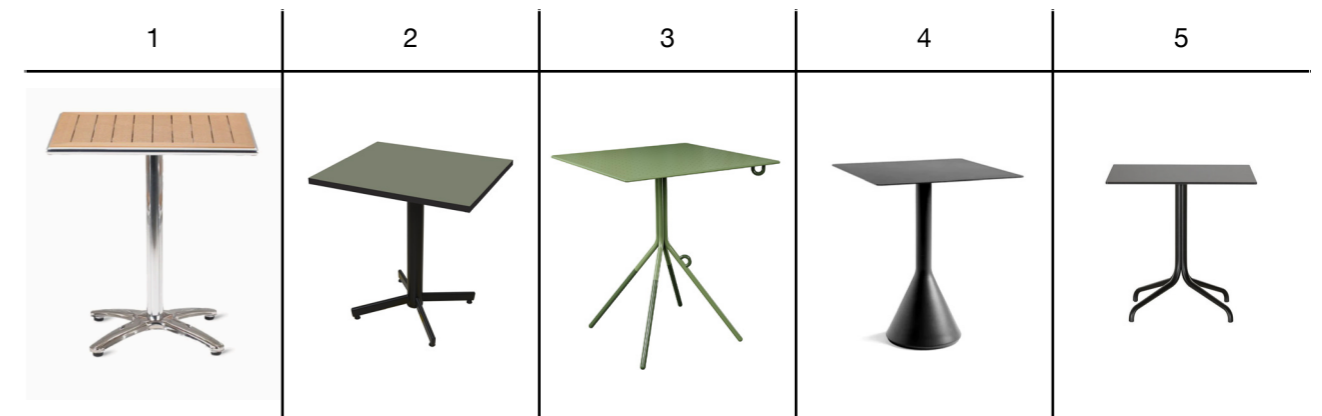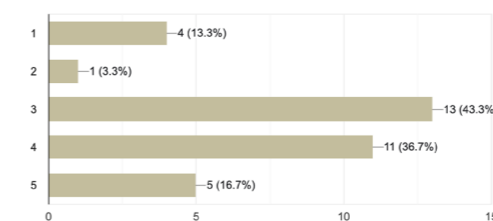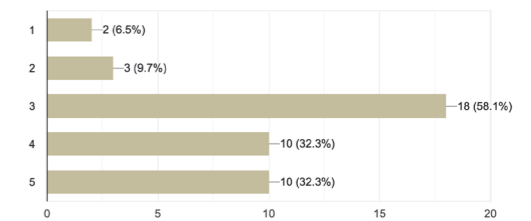
Figure 22. Survey findings

The projected price for end customers of this base model table was set at 299 EUR. This price was set as a goal. The estimated cost for materials, manufacturing, and coloring was set to 180 EUR, leaving 40 percent of the end price for branding, profits, and other expenses. Based on personal opinions and investigations, these predictions seem achievable due to well-designed manufacturing processes that can be performed using existing and reasonably priced tools such as metal bending, cutting using lathe, and welding. Additionally, the pipes and rods used in the table design are of standard size and can be sourced from various suppliers worldwide at relatively low costs. Of course, price depends on the quality of flipping top mechanism and other factors, but these factors are left for future explorations.

After the prototyping phase, it became evident that the targeted price goal was unrealistic, and the manufacturing cost would be higher by at least 20 percent. As a result, the intended positioning had to shift towards a more expensive range of tables.

Aimed positioning

Price
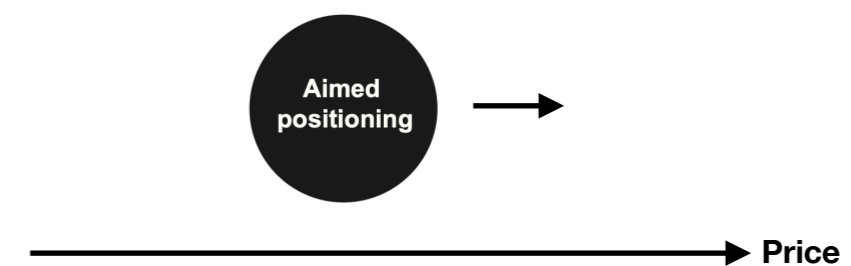
DESIGN POSSIBILITIES AND FUTURE EXPLORATIONS

A more in-depth user testing, durability, and quality assessment must be conducted for this table to be ready for the market. Naturally, marketing and branding strategies should also be implemented. Nevertheless, the future of this table design holds many potential directions and opportunities.

By considering these future explorations and design possibilities, the table can continue to evolve, catering to a broader range of customer needs and preferences while maintaining its commitment to aesthetics, functionality, and innovation:

• **Customisation options:** Offering a range of customisation options, such as varied color combinations, patterns, and finishes, will allow customers to tailor the table to their specific preferences or branding requirements
• **Material Alternatives:** Exploring alternative materials, such as recycled or sustainably sourced options, could make the table more eco-friendly and appeal to environmentally conscious consumers.
• **Ergonomics and Accessibility:** Conducting further research into ergonomics and accessibility could lead to a more inclusive and comfortable design for users with varying abilities and requirements.
• **Collaboration Opportunities:** Partnering with artists or designers for limited edition collections or unique collaborations could help elevate the table's aesthetic appeal and generate increased interest.
• **Technology Integration:** Investigating the integration of technology, such as advance locking system; smart features or lighting options, could provide a more interactive and immersive experience for users
• **Expand Product Line:** Creating a cohesive range of outdoor furniture that complements the table, such as chairs, benches, or umbrellas, can help establish a comprehensive and consistent design language for the brand.

Expanding the table family should be a priority in the design process, as although the medium size of 730 mm height is considered the most popular choice, there is still a demand for tables with varying heights. This table's design allows for easy adaptation to meet those diverse height requirements. Here is a visualisation of a potential expanded product family.

PROTOTYPING PROCESS

FINAL PROTOTYPE

.
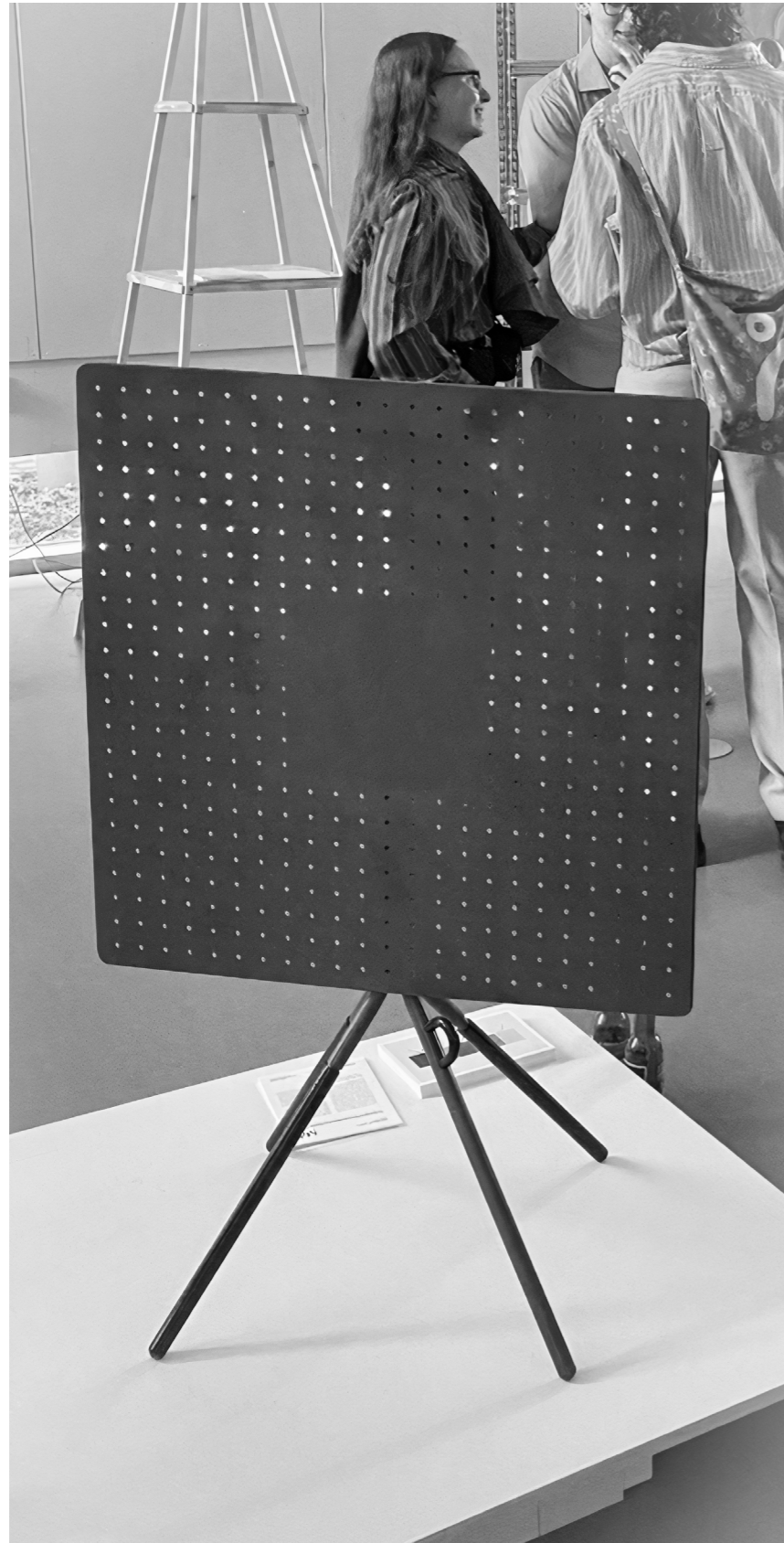
CONCLUSIONS

The practical design topic chosen for this thesis led to a result that addresses actual problems identified not only by myself but also by other stakeholders. The table's design remains minimalistic and simple, which aligns with the project's goal. Personally, I believe that with minor manufacturing adjustments, this table can become a practical product that enhances people's experiences. I am confident in the manufacturing process because it can be achieved with minimal manual labor. Overall, several goals were accomplished during the research, ideation, and prototyping phases. However, there are several areas that warrant further exploration in the future. These include conducting a broader market research, exploring the possibilities of branding and advertising for this table, improving the evaluation process with a more professional approach, conducting thorough price calculations, and taking sustainability into consideration.

Personally, I take pride in the prototyping phases as all the components were manufactured in the facilities at IKDC. I am satisfied with the quality of the prototypes and I am also pleased with the valuable learning experience gained through the hands-on manufacturing process, which I did mostly myself. Additionally, I am confident about the design features that I selected because they were extensively researched and discussed.

In conclusion, this pragmatic approach to addressing the problems has resulted in a satisfying table design. With further development, it has the potential to evolve into a real product and hopefully gain popularity in the hospitality industry.

REFERENCES

Alex, A. (2017). Take-out Restaurants existed in Ancient Rome and were Called Thermopolia. The Vintage News.

Atkins, P. J. (2011). Communal Feeding in War Time: British Restaurants, 1940-1947. In Food and War in Twentieth Century Europe. Farnham, England: Ashgate.

Asadorian, A. (2022). For restaurants still struggling, preserving outdoor dining is key to their survival. Online available from https://www.restaurantdive.com

Early, J. (2001). The Ultimate Guide to Outdoor Furniture Materials. Available online from: https://vevano.com

Ferris, B. (2023). Outdoor Furniture Materials Guide – 2023 Update. Online available: https://decoroutdoor.com

Freeman, A. (2022). Choosing The Best Dining Table Shape For Your Room. Available online: https://www.oka.com

Han, H., Ryu, K. (2009). The Roles of the Physical Environment, Price Perception, and Customer Satisfaction in Determining Customer Loyalty in the Restaurant Industry. Journal of Hospitality & Tourism Research, 33(4), 487–510.

Heung, C. S., Gu, T. (2012). Influence of restaurant atmospherics on patron satisfaction and behavioral intentions. International Journal of Hospitality Management, 31, 1167-1177.

Horng, J. S., Chou, S. F., Liu, C. H., Tsai, C. Y. (2013). Creativity, aesthetics and eco-friendliness: A physical dining environment design synthetic assessment model of innovative restaurants. Tourism Management, 36, 15-25.

Kiefer, N. M. (2002). Economics and the Origin of the Restaurant. Cornell Hotel and Restaurant Administration Quarterly.

Kim, W. G., Lee, Y. K., Yoo, Y. J. (2006). Predictors of relationship quality and relationship outcomes in luxury restaurants. Journal of Hospitality & Tourism Research, 30(2), 143-169.

Kimes, S. E., Robson, S. K. A. (2004). The Impact of Restaurant Table Characteristics on Meal Duration and Spending. Cornell Hotel and Restaurant Administration Quarterly, 45(4), 333–346.

Macht, M., Meininger, J., Roth, J. (2005). The Pleasures of Eating: a Qualitative Analysis. Journal of Happiness Studies.

Menon, S., Kahn, B. (2002). Cross-category effects of induced arousal and pleasure on the Internet shopping experience. Journal of Retailing, 78, 12-31.

Morika, D., Ratum, A. (2021). Review on outdoor furniture in time of pandemic Covid-19: A case of Ir. H. Juanda road, Bandung.

Nguyen, N., Leblanc, G. (2002). Contact personnel, physical environment and the perceived corporate image of intangible services by new clients. International Journal of Service Industry Management, 13, 242-262.

Openshaw, S., Taylor, E. A. (2006). Ergonomics and Design: A Reference Guide. Allsteel.

Patio production. (2014). How to Choose the Best Material for Outdoor Furniture. Available online from: https://patioproduction.com

Property and street office. (2016, revised in 2022) Guidelines for outdoor dining in Malmö. Original title: Fastighets- och gatukontoret. Riktlinjer för uteserveringar i Malmö.

Posist. The Important Elements of Restaurant Interior Design and its Impact on Customers. The Restaurant Times. Retrieved from https://www.posist.com

Scott, N., Laws, E., Boksberger, P. (2009). The marketing of Hospitality and Leisure Experiences. Journal of Hospitality Marketing & Management, 18, 99-110.

Smardzewski, J. (2015). Furniture Design. Springer International Publishing

Ukabi, E., Gurdalli, H. (2021). Comparative Study on Restaurants' Furniture: Ginkgo and Niazi's Restaurants in Famagusta, Cyprus. Civil Engineering and Architecture, 9(1), 23-41..

Thomson, C. (2021). Vancouver restaurant patios reduce loneliness, increase happiness for patrons: study. Online available from https://www.vancouverisawesome.com

Tuzunkan, D., Albayrak, A. (2016). The Importance of Restaurant Physical Environment For Turkish Customers. J Tourism Res Hospitality, 5:1.

Vilnius city municipality. Requirements for outdoor cafes in Vilnius. Original title: *Vilniaus miesto savivaldybė. Reikalavimai lauko kavinėms Vilniuje.*

Vstreefood. (2021). The Pros And Cons Of Outdoor Dining. Online available from https://vstreetfood.com

Winsight. (n.d.). Why it's important to have—and use—an outdoor dining space. Restaurant Business Online. Retrieved from https://www.restaurantbusinessonline.com

Zola, C. (2020). Outdoor Dining: History, Benefits, and Inspiration. Online available from: https://www.herculite.com/

TABLE OF FIGURES

APPENDIX No. 1

CASE No. 1

Findings:

    The people working at the restaurant are generally satisfied with the tables they have. Although the ground is relatively flat, some workers have observed wobbling as an issue on a few occasions. However, the major problem with the tables is that they are too light, making them susceptible to being blown over by the wind, especially at night.

CASE No. 2

Questionnaire No. 2.

1. Are you...?
○ Barista/Waitress
☑ Business manager/owner

2. How many table do you have in your outdoors?
○ 9

3. Does the outdoors seating is...
○ Always there in every seasons
☑ Seasonal, only opens on warm weathers
○ Always there but the number of tables increases on warm weather

4. Where do you store tables at night?
☑ Outside
○ Inside

5. How long does it take to bring tables inside or nest and lock them outside after closing?
○ 1-4 minutes
☑ 5-10 minutes
○ 10-30 minutes

6. Do you find it frustrating to bring tables inside or nest and lock them?
○ No
○ Yes, because...TOO HEAVY, THEY DONT LIFT THEM

7. How many people doing this job?
☑ One
○ Two
○ More then two

8. Has someone stole or damaged the outside furniture during the night?
○ Yes
○ No, not that I know

9. How you deal with wobbling tables?
○ Workers adjust table feet
○ People sitting adjust table feet themselves
○ Both, because during the day you need extra adjustment for feet
☑ We try to find place where it is not wobbling
WONT DO ANYTHING
10. What do you think about your outdoors tables? Can you say some insights that y and dislike about them?

○ Good things:
○ Bad things:
 · HOLES ON THE TOP BETWEEN WOOD
 · TOO HEAVY

Findings:

The people working at the restaurant are quite unhappy with the tables they have. The uneven ground causes the tables to wobble, and the workers have even resorted to using napkins under the legs to stabilize them. However, the major issue with the tables is that they are too heavy, making them difficult to lift and lock. The workers have to use a 20-meter-long chain to move them around.
The manager also mentioned that she has observed things falling off the table tops multiple times. This is likely due to the fact that the table tops are made with gaps between the planks.

Case No. 3

Questionnaire No. 3. HOTEL BAR

1. Are you...?
☑ Barista/Waitress
☑ Business manager/owner

2. How many table do you have in your outdoors?
○ 8

3. Does the outdoors seating is...
○ Always there in every seasons
○ Seasonal, only opens on warm weathers
○ Always there but the number of tables increases on warm weather

4. Where do you store tables at night?
☑ Outside
○ Inside

5. How long does it take to bring tables inside or nest and lock them outside afte
○ 1-4 minutes
☑ 5-10 minutes
○ 10-30 minutes

6. Do you find it frustrating to bring tables inside or nest and lock them?
~ No
○ Yes, because.................................

7. How many people doing this job?
☑ One
○ Two
○ More then two

8. Has someone stole or damaged the outside furniture during the night?
○ Yes THEY SAW PEOPLE TRYING TO SEE IF THE TABLES
○ No, not that I know   ARE LOCKED

9. How you deal with wobbling tables?
☑ Workers adjust table feet
○ People sitting adjust table feet themselves
○ Both, because during the day you need extra adjustment for feet
☑ We try to find place where it is not wobbling
○ THEY STAY IN THE SAME SPOT
10. What do you think about your outdoors tables? Can you say some insights that you like and dislike about them?

○ Good things: FLIP TOP
○ Bad things: COLOR CAN SCRATCH OF

200 E PER TABLE

Lusini Vega

Findings:

The restaurant terrace at this hotel has recently installed new tables that have a feature - the ability to flip the table tops 90 degrees. According to the worker, they simply flip the table tops and leave the table where it is. A big chain is used to lock the table in place. They have a metal hole installed in to the buildings wall to lock the furniture not only together but also to the building. However, one issue that concerns the workers is the presence of small rocks on the ground. As customers tend to put their feet on the table legs, the rocks can potentially scratch the paint on the legs.

CASE No. 4

Questionnaire No. 4. ICE CREAM PLACE

1. Are you...?

○ Barista/Waitress
✓ Business manager/owner

2. How many table do you have in your outdoors?

○ ~6

3. Does the outdoors seating is...

○ Always there in every seasons
✓ Seasonal, only opens on warm weathers
○ Always there but the number of tables increases on warm weather

4. Where do you store tables at night?

○ Outside
✓ Inside

5. How long does it take to bring tables inside or nest and lock them outside after closing?

○ 1-4 minutes
○ 5-10 minutes
✓ 10-30 minutes   20 mins

6. Do you find it frustrating to bring tables inside or nest and lock them?

○ No
✓ Yes, because.. HEAVY !...............................

7. How many people doing this job?

✓ One
○ Two
○ More then two

8. Has someone stole or damaged the outside furniture during the night?

○ Yes
✓ No, not that I know

9. How you deal with wobbling tables?

○ Workers adjust table feet
○ People sitting adjust table feet themselves
○ Both, because during the day you need extra adjustment for feet
✓ We try to find place where it is not wobbling

10. What do you think about your outdoors tables? Can you say some insights that you like and dislike about them?

✓ Good things:
○ Bad things:

Findings:

At this ice cream shop, the owner who also works as the cashier has mentioned that he stores the tables inside the building. This means that he needs to carry the tables every morning to the terrace and then back to the building after closing. He has stated that this is a difficult task because the tables are heavy and he has to do it alone. It takes more than 20 minutes to do it, even though he has only 6 tables.

Case No. 5

Questionnaire No. 5.

1. Are you...?

✓ Barista/Waitress
○ Business manager/owner

2. How many table do you have in your outdoors?

○ ~25

3. Does the outdoors seating is...

○ Always there in every seasons
✓ Seasonal, only opens on warm weathers
○ Always there but the number of tables increases on warm weather

4. Where do you store tables at night?

✓ Outside
○ Inside

5. How long does it take to bring tables inside or nest and lock them outside after closing?

○ 1-4 minutes
✓ 5-10 minutes
○ 10-30 minutes

6. Do you find it frustrating to bring tables inside or nest and lock them?

✓ No
○ Yes, because...

7. How many people doing this job?

✓ One
○ Two
○ More then two

8. Has someone stole or damaged the outside furniture during the night?

○ Yes
✓ No, not that I know

9. How you deal with wobbling tables?

○ Workers adjust table feet
○ People sitting adjust table feet themselves
○ Both, because during the day you need extra adjustment for feet
○ We try to find place where it is not wobbling
✓ STABLE TABLE

10. What do you think about your outdoors tables? Can you say some insights that you like and dislike about them?

✓ Good things: EVERYTHING IS GOOD.
○ Bad things:

USES CHAIN TO LOCK THEM

Findings:

This restaurant has many tables, and they are using self-stabilizing "Stable tables." The waitress has expressed her satisfaction with the tables overall. She has mentioned that they simply leave the tables as they are and lock them together.
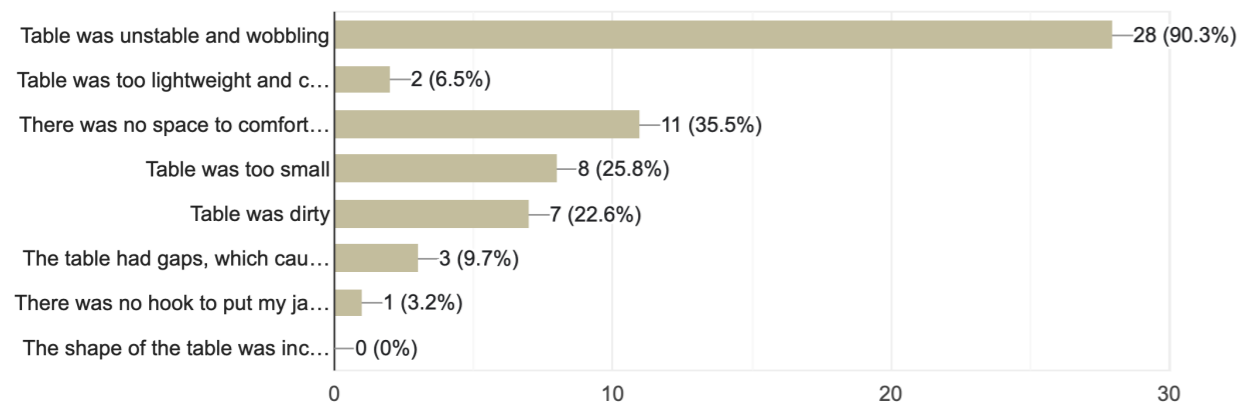
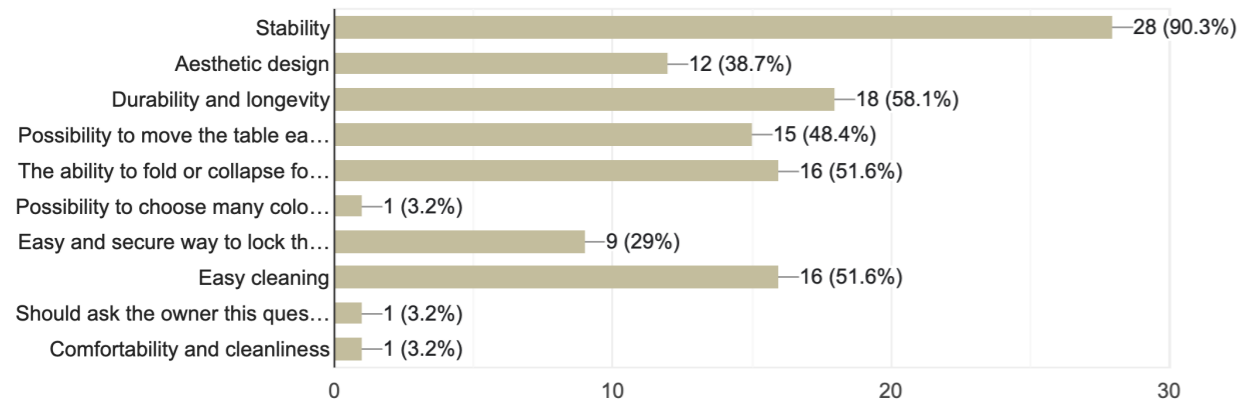## What material do you think would be best for an outdoor table?

30 responses

Material	Value
Wood	16 (53.3%)
Metal	15 (50%)
Plastic	7 (23.3%)
No opinion	3 (10%)
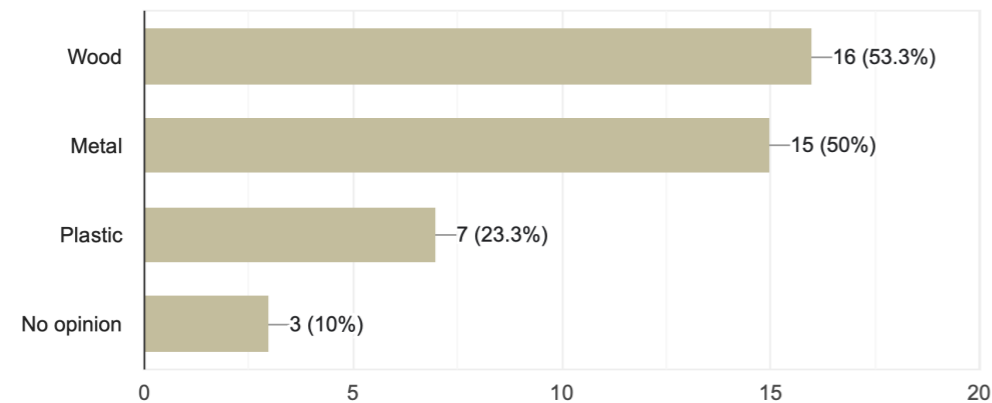
Which issue annoys you the most while sitting at an outdoor table?

31 responses

Issue	Value
Table was unstable and wobbling	28 (90.3%)
Table was too lightweight and c…	2 (6.5%)
There was no space to comfort…	11 (35.5%)
Table was too small	8 (25.8%)
Table was dirty	7 (22.6%)
The table had gaps, which cau…	3 (9.7%)
There was no hook to put my ja…	1 (3.2%)
The shape of the table was inc…	0 (0%)

Which features do you think are the most important for a good outdoor table for restaurants and cafes?

31 responses

Feature	Value
Stability	28 (90.3%)
Aesthetic design	12 (38.7%)
Durability and longevity	18 (58.1%)
Possibility to move the table ea…	15 (48.4%)
The ability to fold or collapse fo…	16 (51.6%)
Possibility to choose many colo…	1 (3.2%)
Easy and secure way to lock th…	9 (29%)
Easy cleaning	16 (51.6%)
Should ask the owner this ques…	1 (3.2%)
Comfortability and cleanliness	1 (3.2%)

CASE No. 6
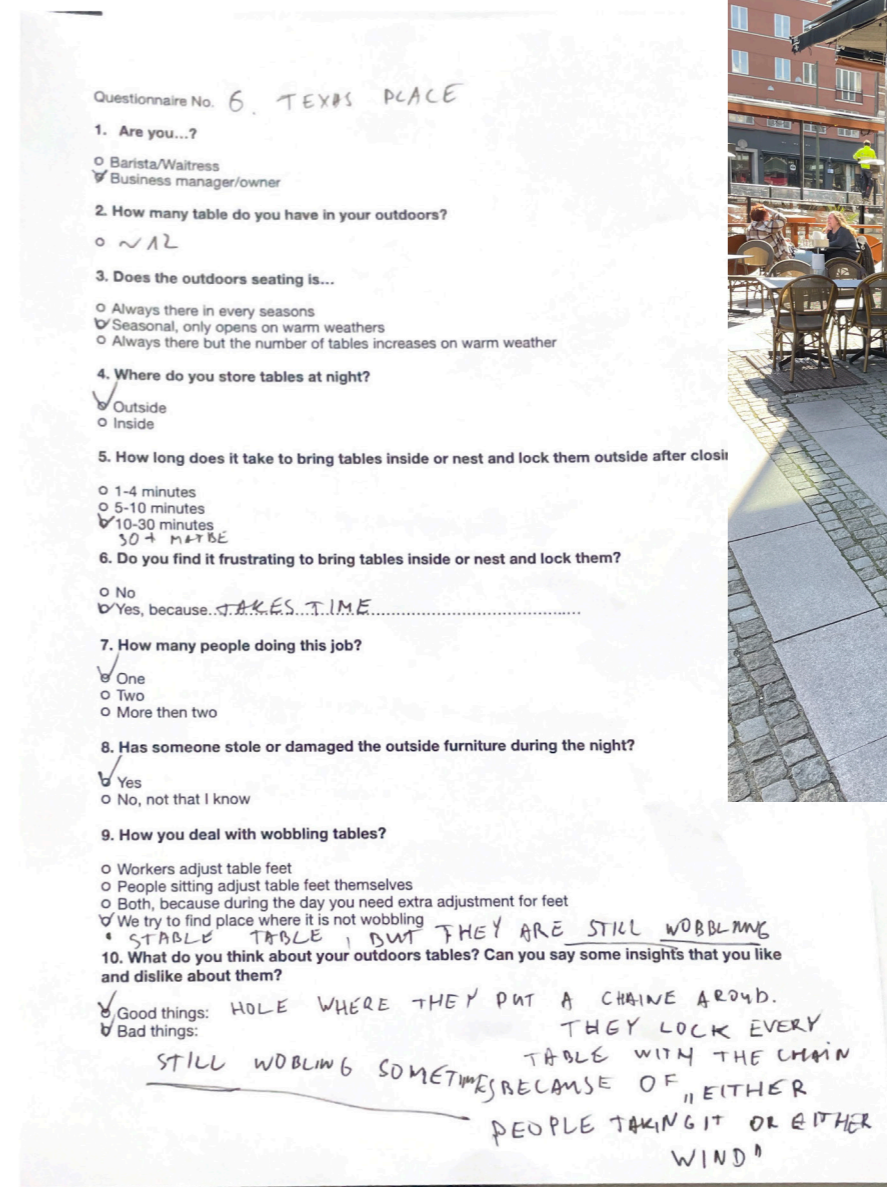
Findings:

In this restaurant, the worker explained that they keep the tables in place by locking them together with a big chain. He complained that it takes more than 30 minutes, but he was happy that the tables have holes underneath the table top, which makes it easier to lock every table with the other one. The worker also mentioned that locking the tables is essential because either people or the wind could take them during the night. The tables they have outside are called "Stable tables," but the worker said that sometimes they still wobble because the ground is very uneven.

Findings:

In this outdoor restaurant, what is interesting is that tables that are not being used at the moment are stored on the side of the building near bushes and trees, making them less visible to the public. In the picture, someone has done "graffiti" on the table tops, also we can also see how the paint on the legs is damaged and scratched off.

Findings:

This restaurant recently opened their terrace and is expanding. Currently, they are putting the tables inside during the night, but they are too heavy for the female staff. They want to have more tables, so they are planning how they can securely lock and leave tables outside. However, since the tables don't have holes and have a round design, it is challenging to find a way to lock them securely.

Questionnaire No. 9. WAYNE'S COFFE

1. Are you…?
☑ Barista/Waitress
○ Business manager/owner

2. How many table do you have in your outdoors?
○ ~10

3. Does the outdoors seating is…
○ Always there in every seasons
☑ Seasonal, only opens on warm weathers
○ Always there but the number of tables increases on warm weather

4. Where do you store tables at night?
☑ Outside   NOT LOCKING AT ALL
○ Inside

5. How long does it take to bring tables inside or nest and lock them outside aft
○ 1-4 minutes
☑ 5-10 minutes
○ 10-30 minutes

6. Do you find it frustrating to bring tables inside or nest and lock them?
○ No
○ Yes, because………………………………………………………

7. How many people doing this job?
○ One
○ Two
○ More then two

8. Has someone stole or damaged the outside furniture during the night?
○ Yes
☑ No, not that I know

9. How you deal with wobbling tables?
○ Workers adjust table feet
○ People sitting adjust table feet themselves
○ Both, because during the day you need extra adjustment for feet
○ We try to find place where it is not wobbling

10. What do you think about your outdoors tables? Can you say some insights that you like and dislike about them?
○ Good things:
○ Bad things:

Findings:

The outdoor area of this coffee place was interesting for two reasons. Firstly, they are using a table design that is not seen anywhere else in the city. Secondly, they are leaving tables outside during the night without locking them at all. Based on this, it can be concluded that the table design is unique and doesn't have a shape suitable for attaching a chain, nor are there any holes or other means of locking them.

Questionnaire No. 10 „GATEAU" WITH HAY CHAIRS

1. Are you…?
☑ Barista/Waitress
○ Business manager/owner

2. How many table do you have in your outdoors?
○ ~14

3. Does the outdoors seating is…
○ Always there in every seasons
☑ Seasonal, only opens on warm weathers
○ Always there but the number of tables increases on warm weather

4. Where do you store tables at night?
☑ Outside   LOCK THEM TOGETHER. KEEPS IN SAME PLACE
○ Inside

5. How long does it take to bring tables inside or nest and lock them outside after closing?
○ 1-4 minutes
☑ 5-10 minutes   10 min
○ 10-30 minutes

6. Do you find it frustrating to bring tables inside or nest and lock them?
☑ No
○ Yes, because………………………………………………………

7. How many people doing this job?
☑ One
○ Two
○ More then two

8. Has someone stole or damaged the outside furniture during the night?
○ Yes
☑ No, not that I know

9. How you deal with wobbling tables?
○ Workers adjust table feet
○ People sitting adjust table feet themselves
○ Both, because during the day you need extra adjustment for feet
○ We try to find place where it is not wobbling

10. What do you think about your outdoors tables? Can you say some insights that you like and dislike about them?
○ Good things:
○ Bad things:

Findings:

This coffee place has relatively new "stable table" tables, and they are happy with them. They leave the tables where they stand and lock them during the night. What was surprising is that the baristas didn't know that they could lift the table top 90 degrees.

APPENDIX No. 2

## If we are talking about cafes and bakeries, would you prefer to sit inside or outside when the weather is good?
31 responses
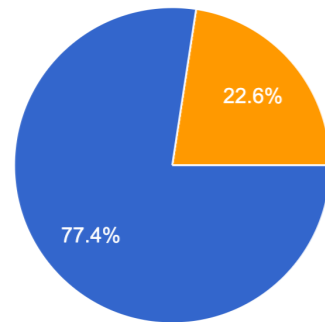
- 77.4% — I prefer sitting outside if the weather is good
- 22.6% — It depends if I find the outside area to be nice and suitable for me
- I prefer sitting inside even if the weather is good

If we are talking about restaurant and fine dining places, would you prefer to sit inside or outside when the weather is good?
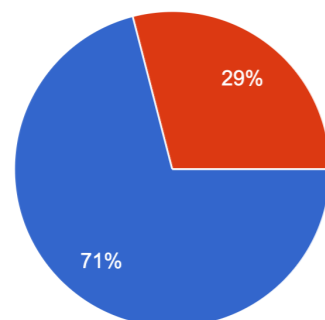31 responses
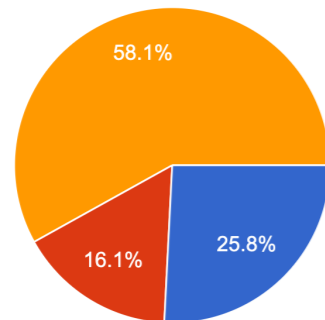
- 58.1% — It depends if I find the outside area to be nice and suitable for me
- 25.8% — I prefer sitting outside if the weather is good
- 16.1% — I prefer sitting inside even if the weather is good

Is the design of outdoor furniture in restaurants/cafes important to you?
31 responses

- 71% — Yes, I prefer well design and comfortable furniture
- 29% — It isn't important to me unless the furniture is very uncomfortable or inconvenient

What colors do you think would be best suited for an outdoor table?
31 responses

Option	Value
Dark (Black, dark brown, grey ...)	12 (38.7%)
Medium bright and intensity (Green, darker blue, earth color…	20 (64.5%)
Bright and light (Yellow, red, light blue and so on)	2 (6.5%)
No opinion	2 (6.5%)
It depends on caffe/bar interior/ exterior	1 (3.2%)
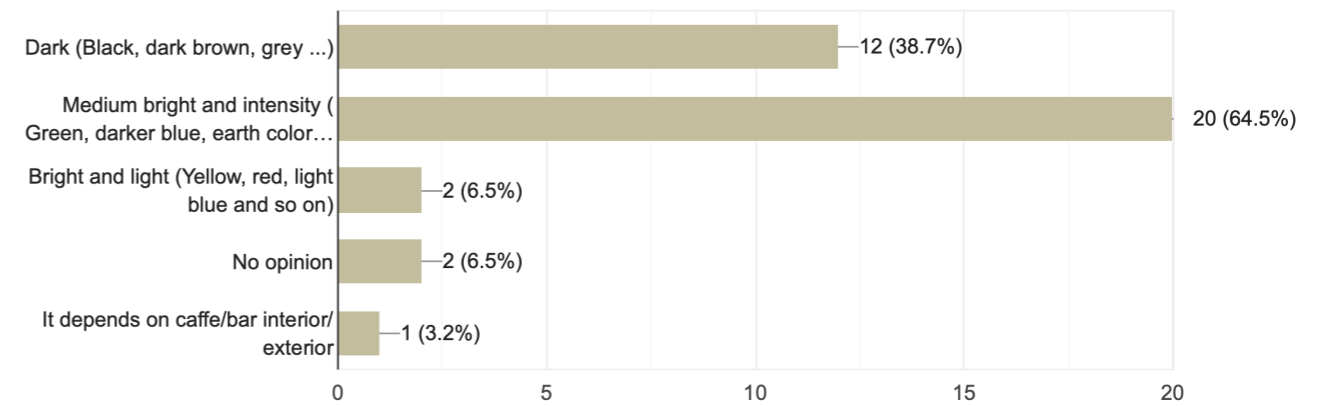
Have you ever placed napkins or any other items under the feet of a table to prevent it from wobbling?
31 responses
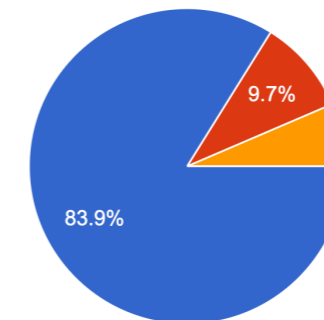
- 83.9% — Yes
- 9.7% — No
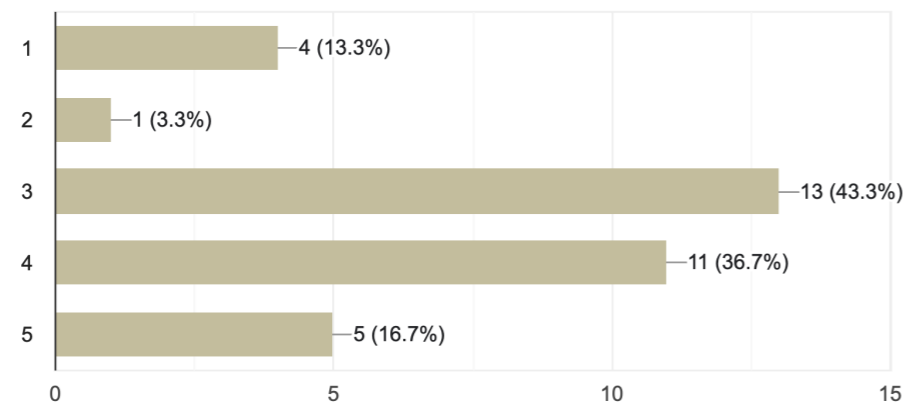- I just seen that people do that

Which outdoor table would you choose for your private outdoor area, such as a terrace or balcony? (Colors can be chosen)
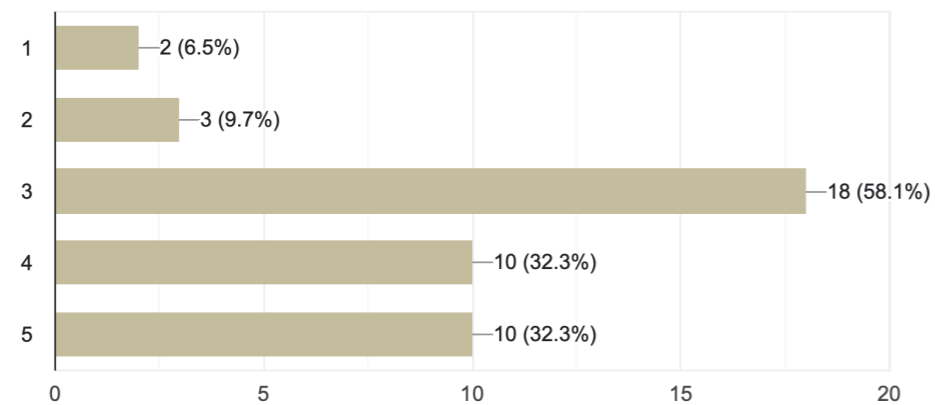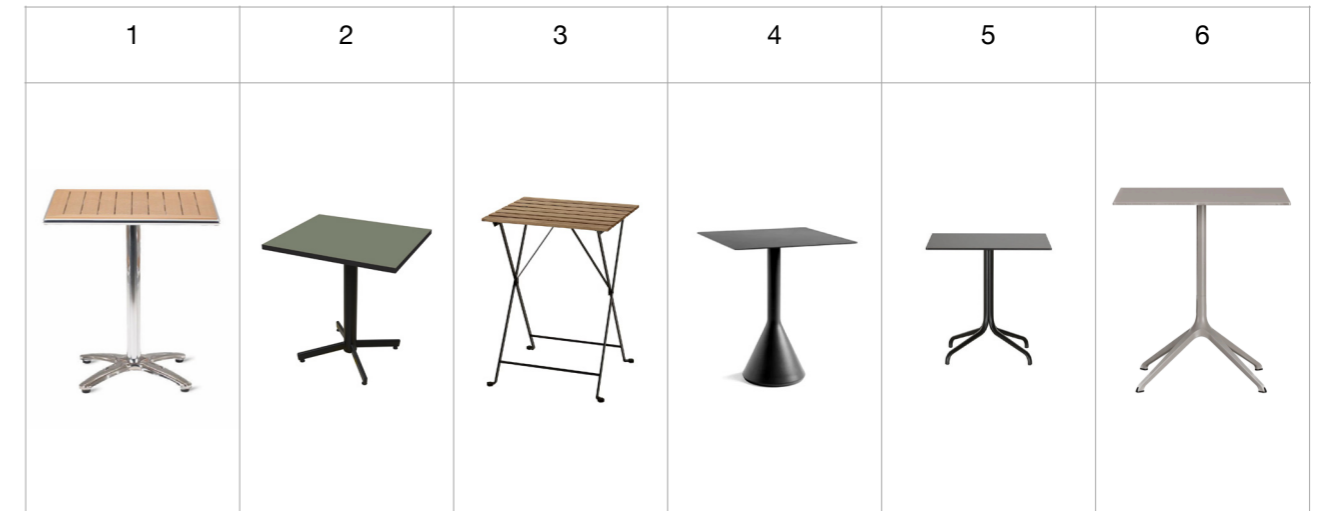
30 responses

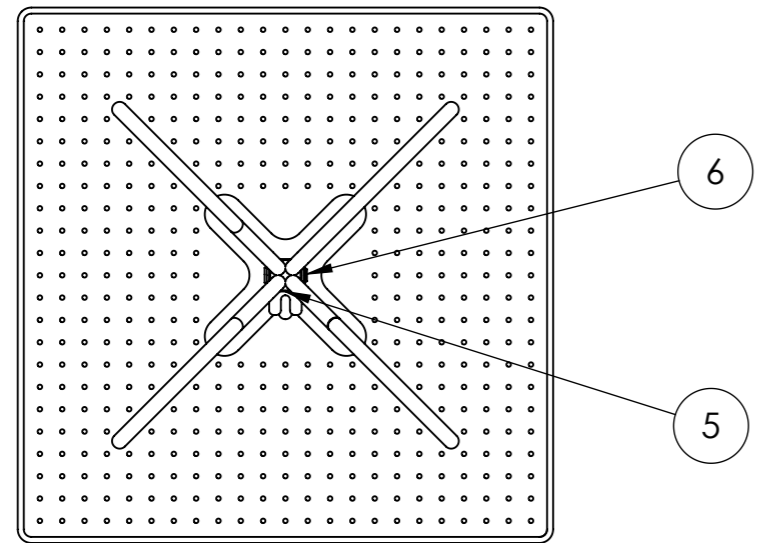Which outdoor table do you find the most aesthetically beautiful? (Colors can be chosen)

31 responses

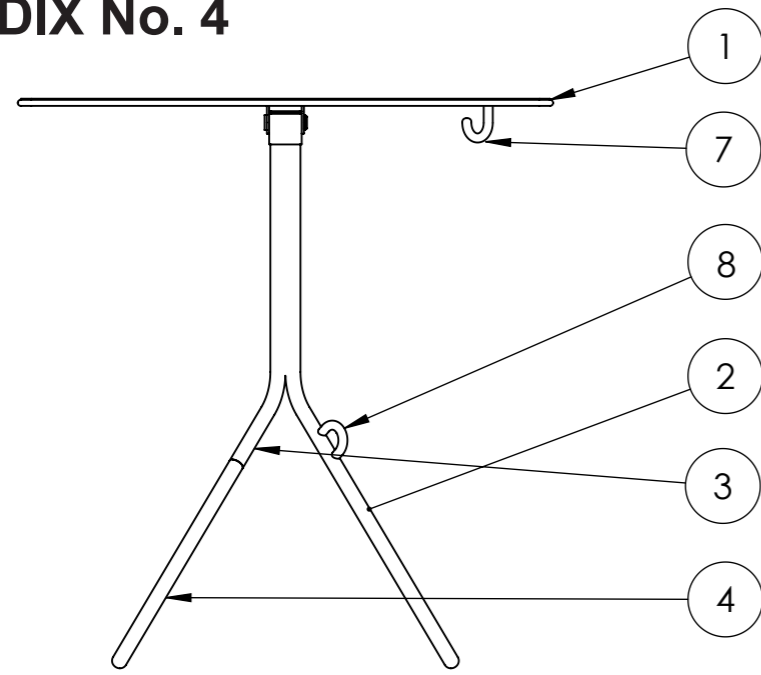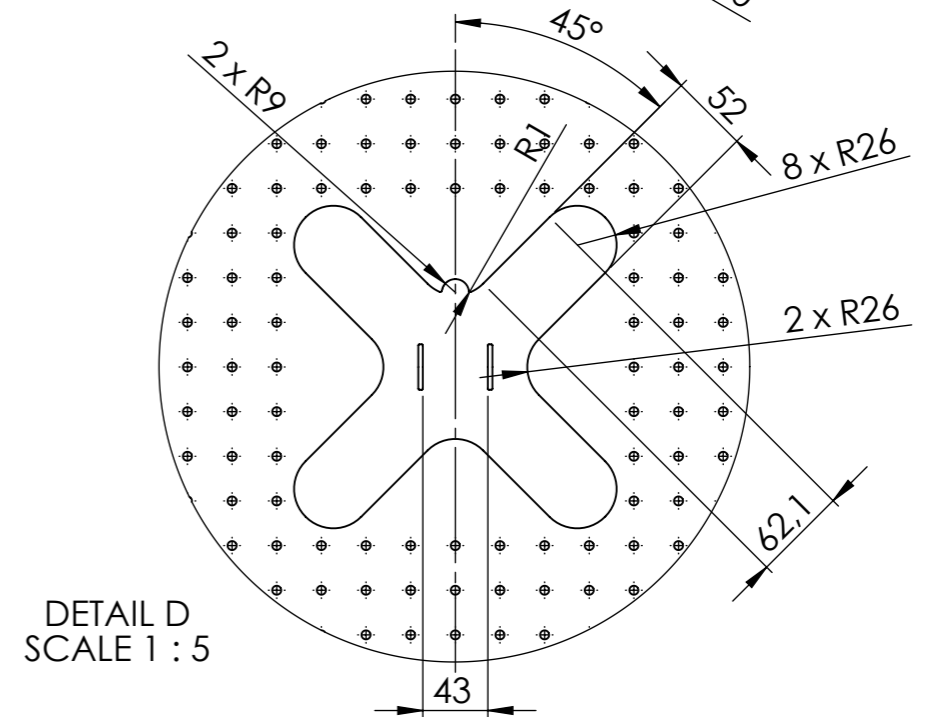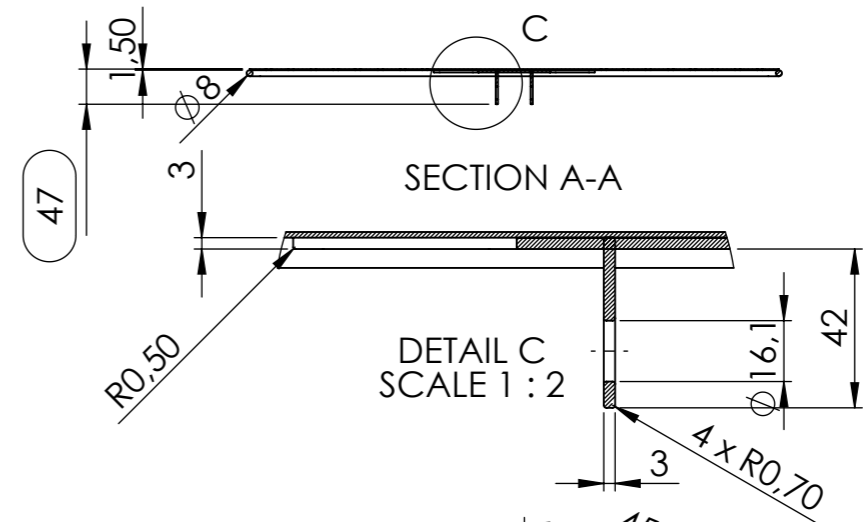Pictures used in last two questions:

APPENDIX No. 3

1	2	3	4	5	6

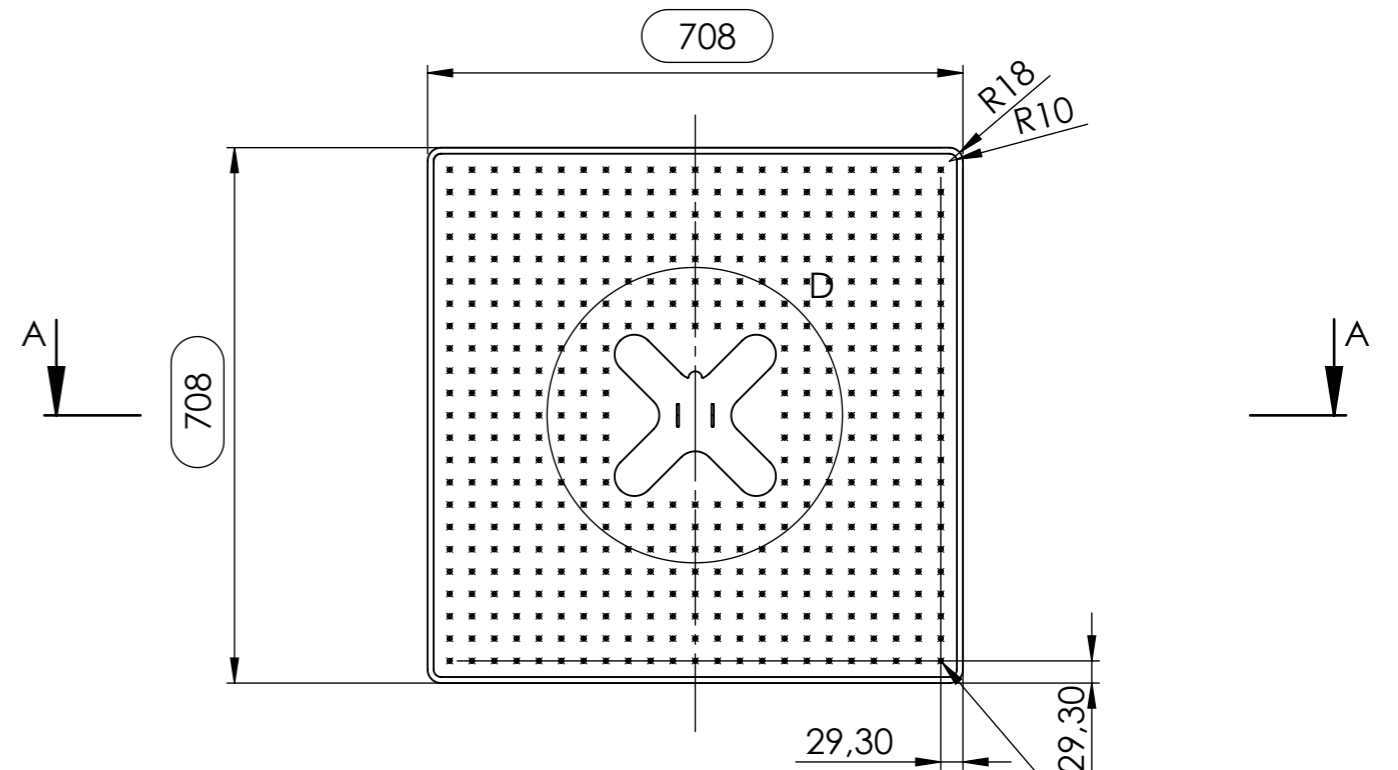1. Paulo Outdoor Square Table. https://www.theclassroom.co/outdoor-tables/paulo-outdoor-square-table.html
2. StableTable. Restaurangbord FlexCross 64 Linoleum. https://furnitgroup.se/butik/bord/restaurangbord/stable-table/restaurangbord-flexcross-64-linoleum/
3. Ikea. TÄRNÖ. https://www.ikea.com/au/en/p/taernoe-table-outdoor-black-light-brown-stained-80165129/
4. HAY. Palissade Cone Table. https://us.hay.com/outdoor-tables/palissade-cone-table/2516318.html?lang=en_US
5. Vitra. Belleville Table. https://www.vitra.com/en-se/living/product/details/belleville-table-bistro
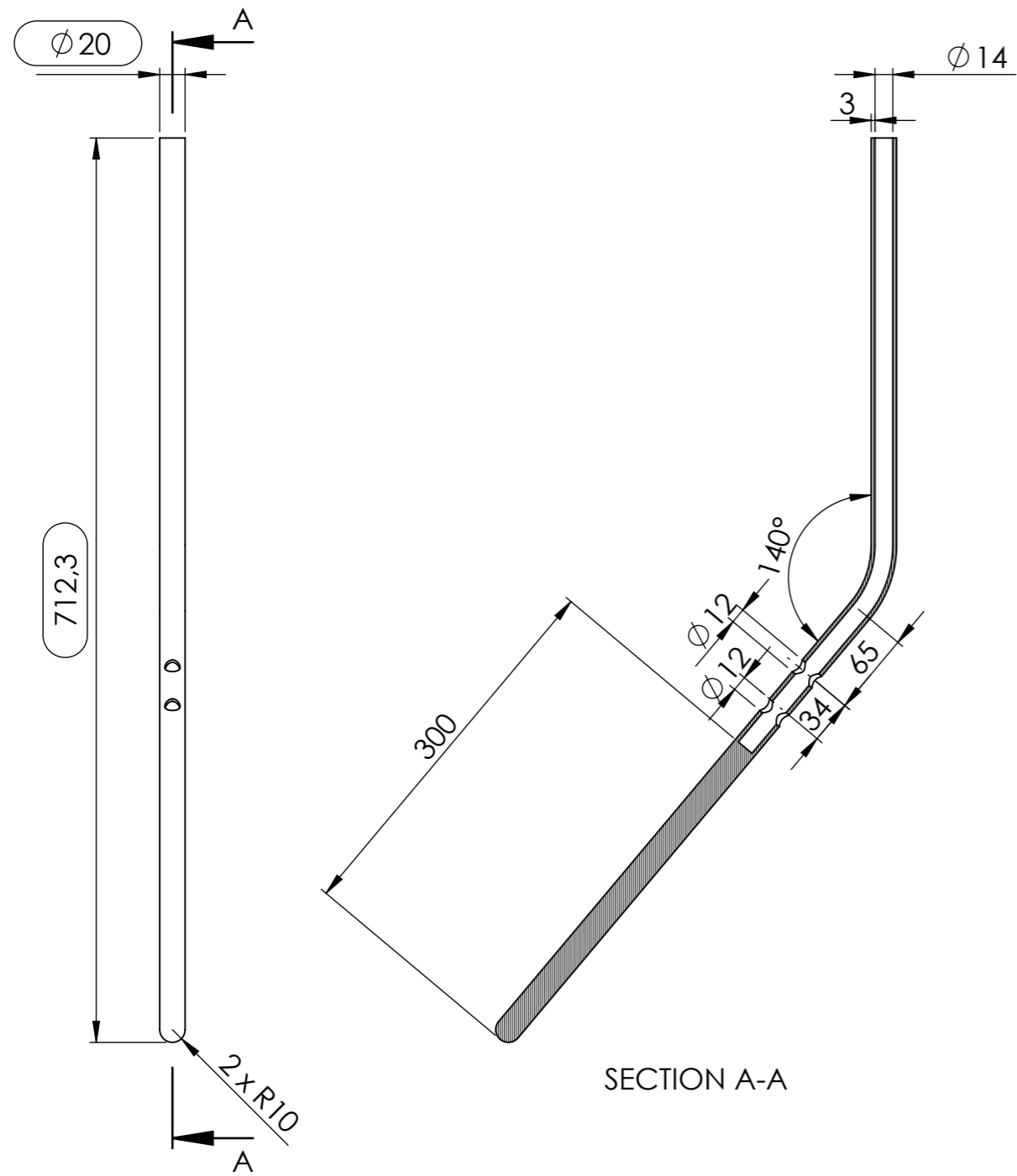6. Toou. Eex. https://www.tooudesign.com/en/eex/

APPENDIX No. 4

M 1:10 (A4 SIZE)

ITEM NO.	NAME	QTY.
1	Table top	1
2	Stable leg	1
3	Adjustable leg	3
4	Adjustable leg end	3
5	Square part	1
6	Shaft	1
7	Hook	1
8	Loop	1

708

708

R18
R10

29,30

29,30

529x Ø 6 ▽ THRU ALL

SECTION A-A

1,50

Ø 8

3

47

R0.50

DETAIL C
SCALE 1 : 2

Ø 16.1

42

3

4 x R0.70

45°

2 x R9

R1

52

8 x R26

2 x R26

62.1

43

DETAIL D
SCALE 1 : 5

M 1:10 (A4 SIZE)

ITEM NO	NAME	MATERIAL
1	Table top	1.5/3 mm steel sheet/ 8mm steel rod

Ø20   A

Ø14
3

712,3

140°

Ø12
Ø12

300

65
34

2×R10

A

SECTION A-A

M 1:10 (A4 SIZE)

ITEM NO	NAME	MATERIAL
2	Stable leg	20 mm. Steel pipe

Ø20   A

Ø14
3

500,2

140°

30

M12x1.5

A

SECTION A-A
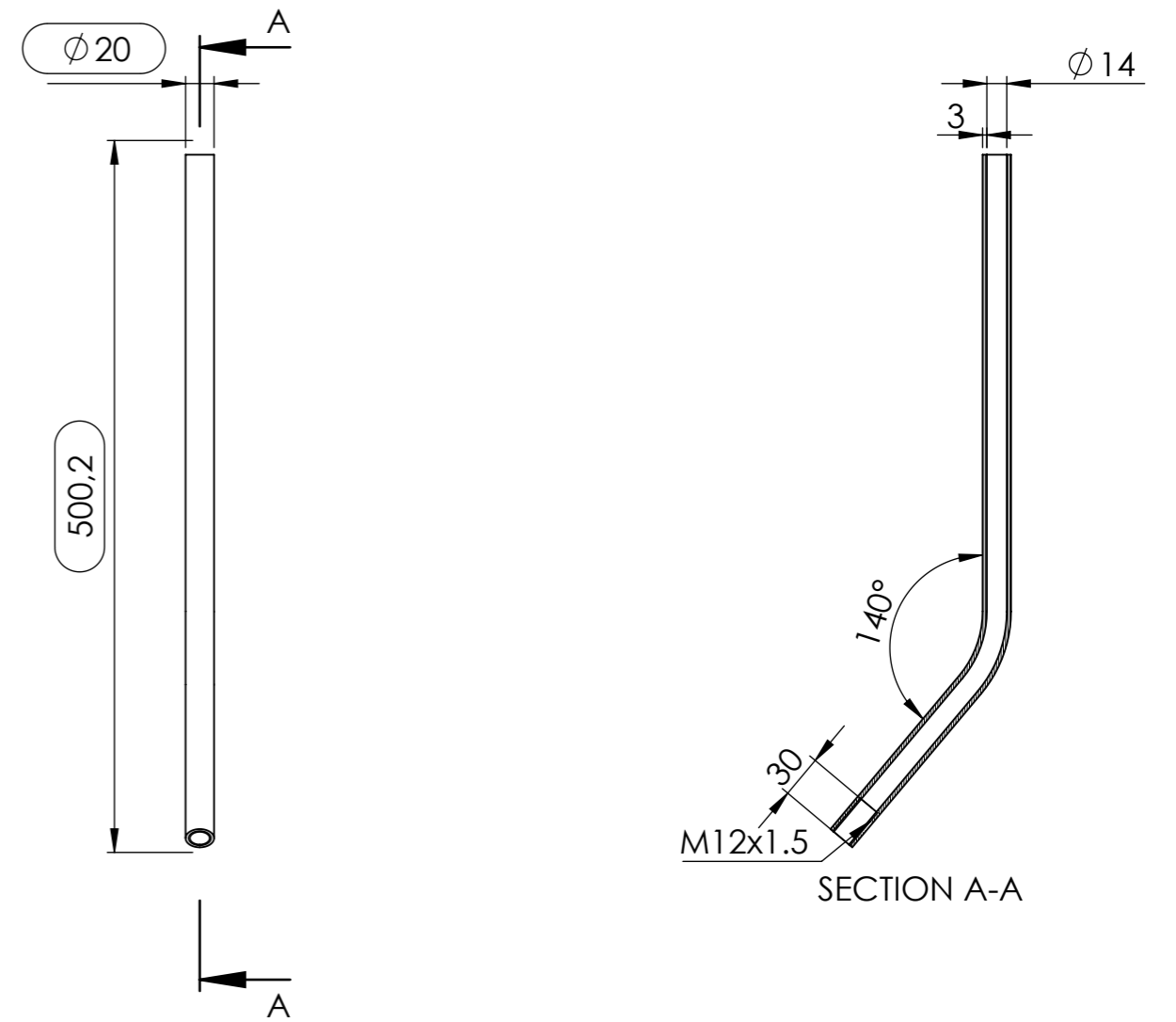
M 1:10 (A4 SIZE)

ITEM NO	NAME	MATERIAL
3	Adjustable leg	20 mm. Steel pipe

Ø20

300

B

B

50

Ø16

SECTION B-B

R10

74

A

A

44

11,1

Ø16

21,6

3

4 x R0.5

2

1,50

SECTION A-A

2 x R2,50

74

6 x R6

15,5

43

26
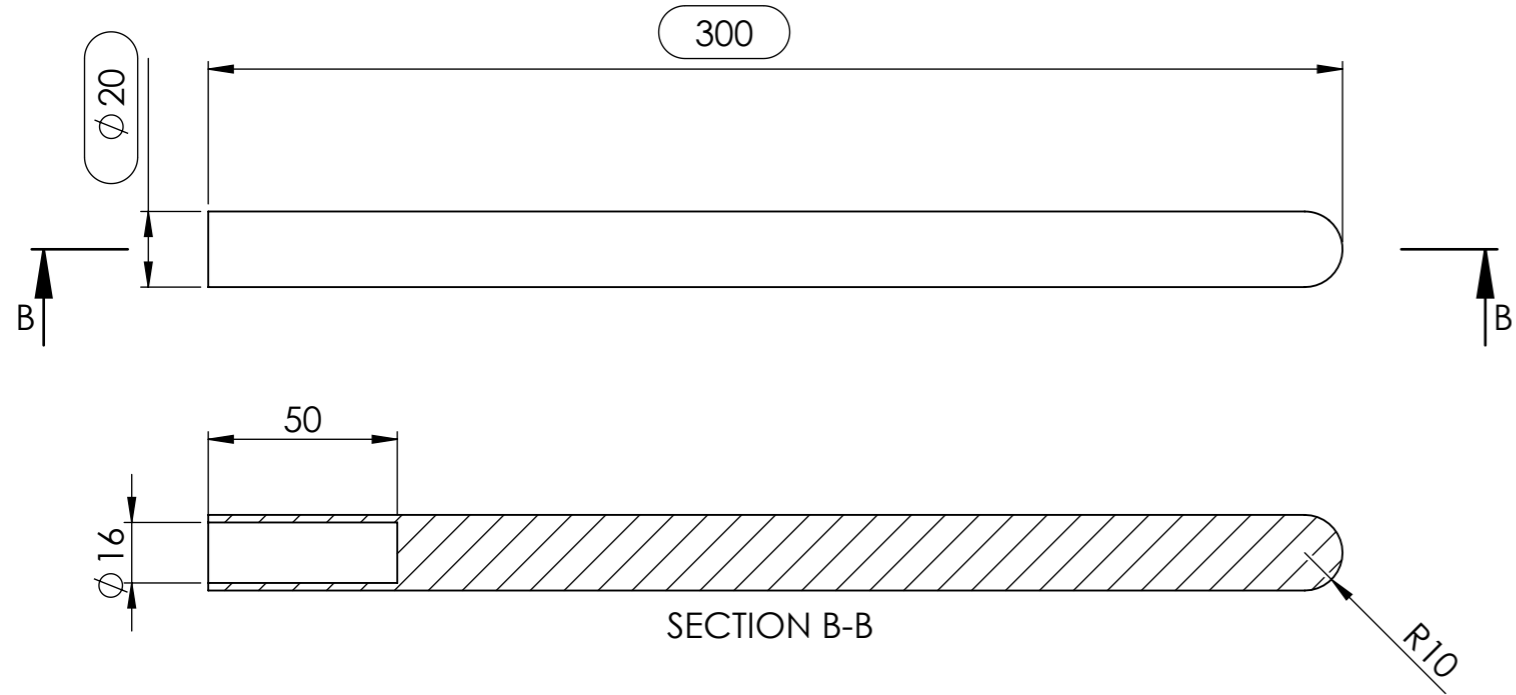
M 1:2 (A4 SIZE)

M 1:2 (A4 SIZE)

ITEM NO	NAME	MATERIAL
4	Adjustable leg end	20 mm. Steel rod
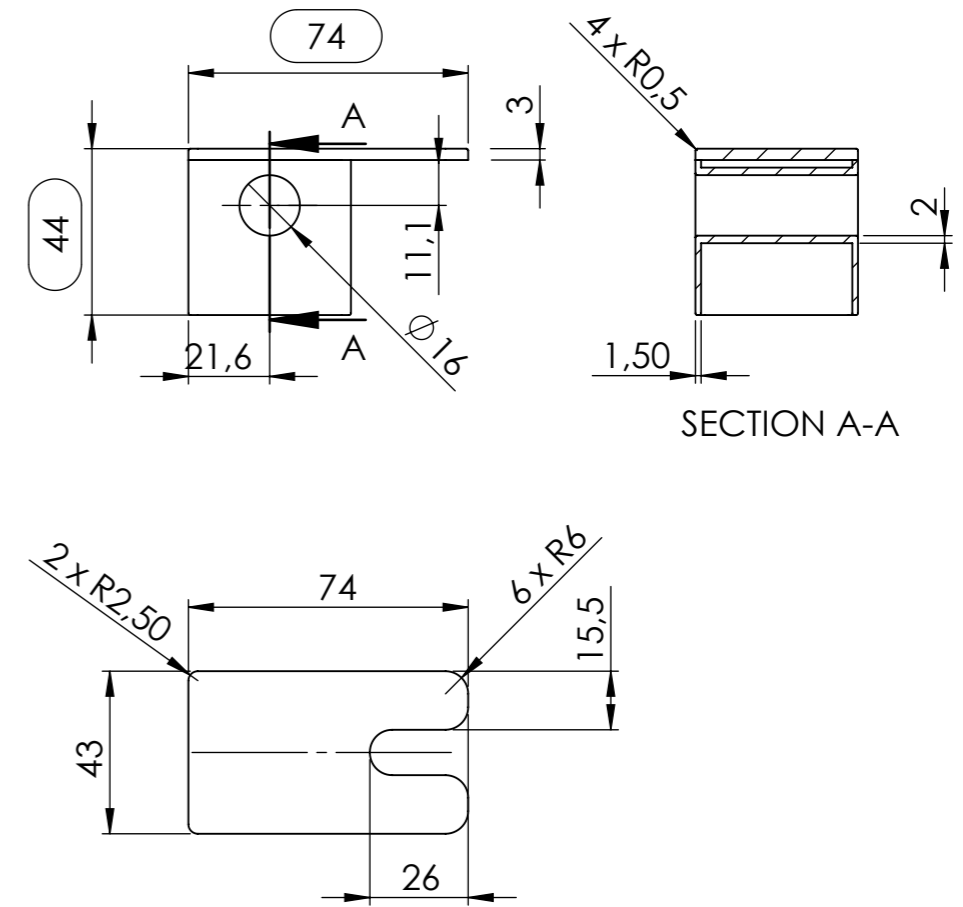
ITEM NO	NAME	MATERIAL
5	Square part	Steel

Ø20 3

2 x R0,3
R0,3

56

1

2

1

Ø20

Ø16
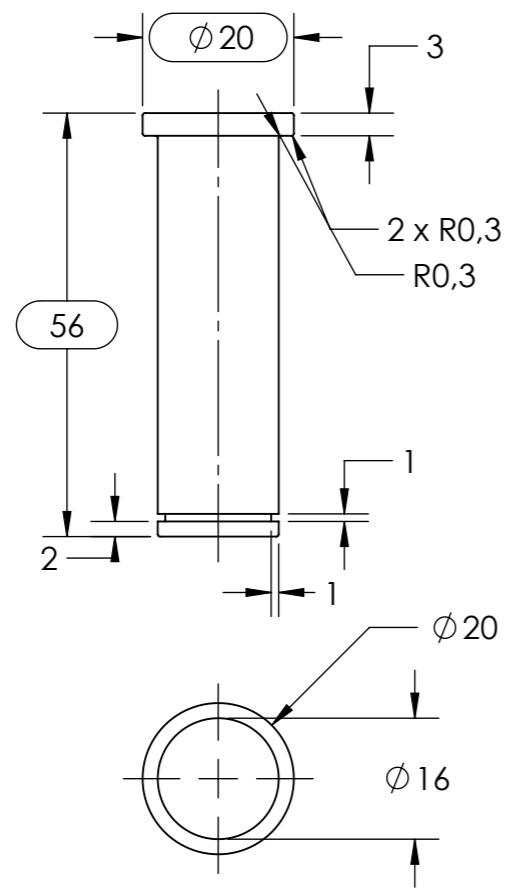
M 1:1 (A4 SIZE)

ITEM NO	NAME	MATERIAL
6	Shaft	Steel

Ø30 1

57

61

Ø12
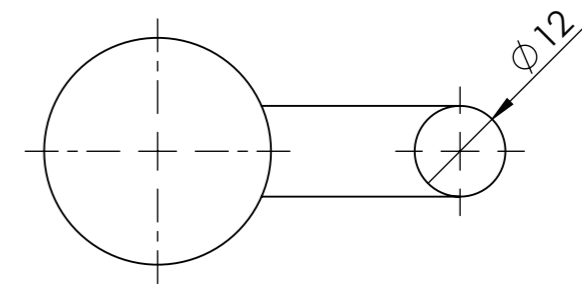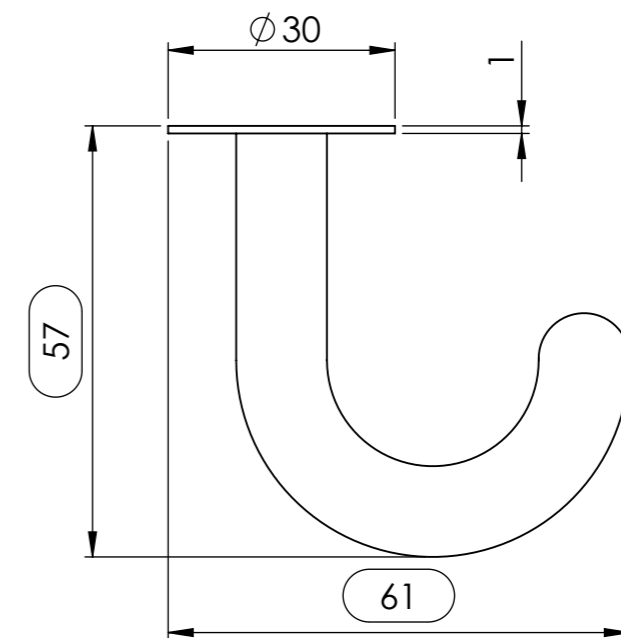
M 1:1 (A4 SIZE)

ITEM NO	NAME	MATERIAL
7	Hook	Steel

52

44

18

R26

Ø12
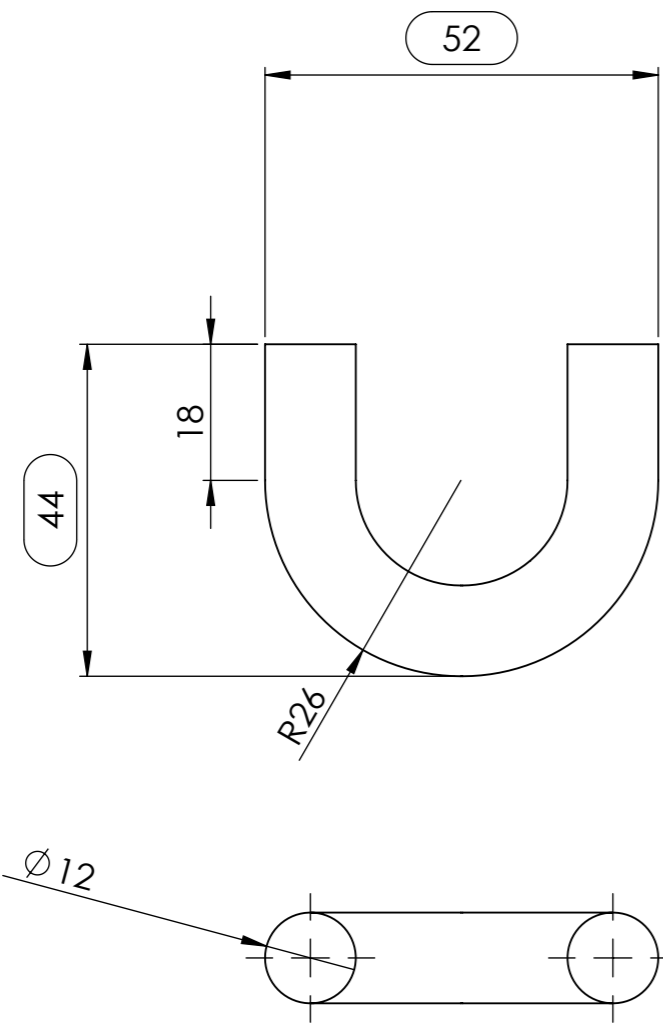
M 1:1 (A4 SIZE)

ITEM NO	NAME	MATERIAL
8	Loop	Steel