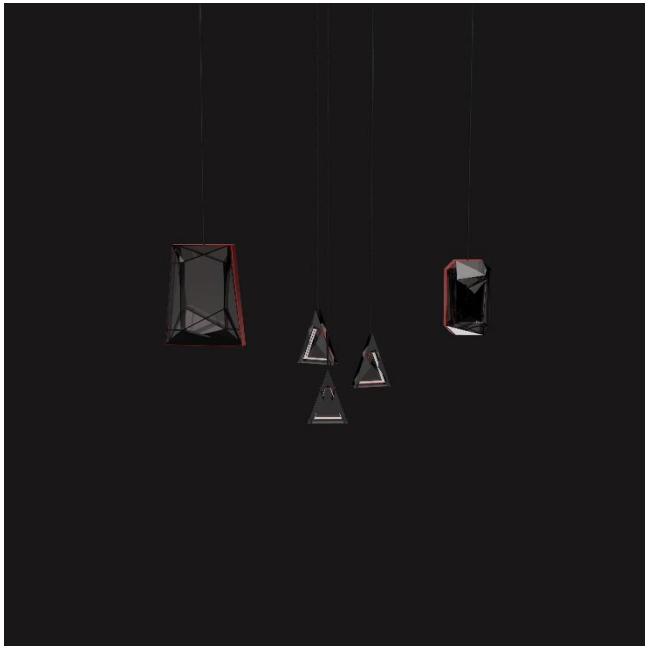




EVALUATION REPORT.

STEALTH LIGHTING COLLECTION

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MAJOR PROJECT: DESIGN
REALISATION &
COMMUNICATION

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BA PRODUCT DESIGN

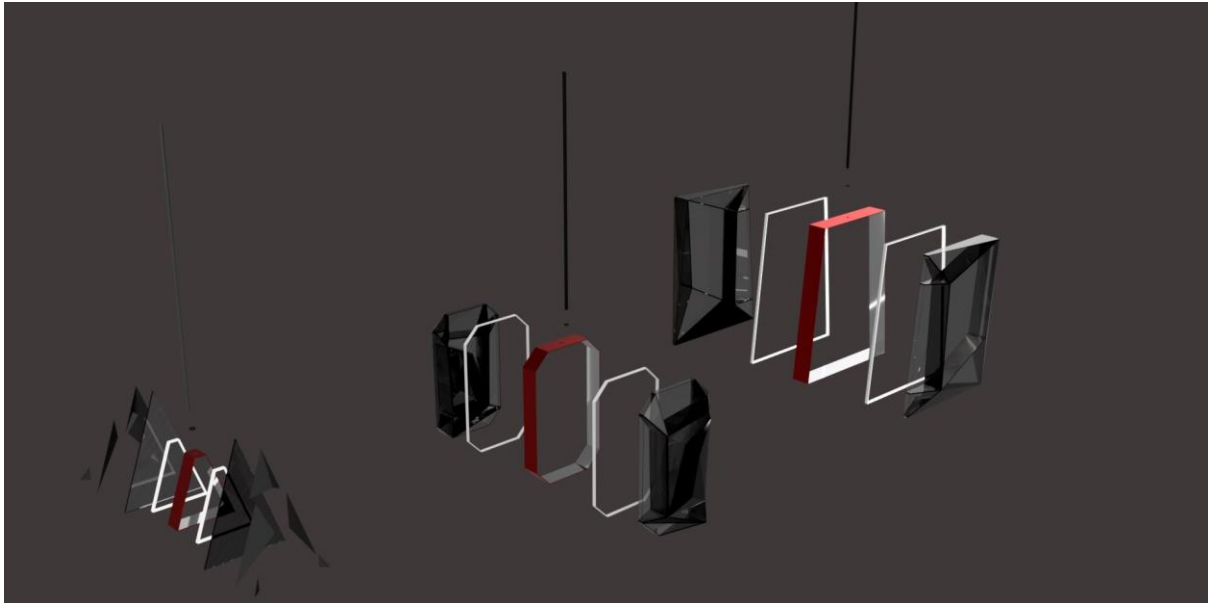


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1. INTRODUCTION

Within this report I am going to discuss in depth, my final projects features and details which includes Fitness for purpose, Market awareness, and sustainability and how my project relates to my design manifesto. I intend on showing smaller features such as cost analysis and product feature detailing in order for you to fully understand my project to the highest degree.



2. EXECUTIVE SUMMARY

THE STEALTH COLLECTION: My project is a collection of pendant lights which have been based and inspired from my interpretation of stealth and the use of crystal formations as a guide to create a beautiful and functional project all in one. It's mainly angled oddly shaped smoked/frosted acrylic body is wrapped in an aluminium frame which comes in a selection of satin finishes. Its use of rayon cable and cool white L.E.D strips gives a modern styling which compliments the main design outcome very well. It is intended to be sold in the upper market with the likes of Tom Raffield and Tom Dixon, and can be sold in the current market. For a price starting from £200 - £300, you expect a gold standard quality which is exactly what you get with this collection, which also includes features such as a personal Vin code (1 to 150), personalised letter etching (to your choice) and a huge 5 year warranty on the LED wire. This collection is something you simply will not see anywhere else.

3. FITNESS FOR PURPOSE

Within the area of fitness for purpose there are many areas to be discussed in order to fully grasp what my lighting collection is all about, these areas include:

- Product feature detailing
- Product architecture
- Materials and Manufacturing
- Aesthetics
- User needs and Ergonomics

Product feature detailing:

Cost- I have a detailed cost analysis for each one of my lights. All pricings for each process came from a trusted company who specialise within that particular area. My initial costing from my PDS was to be between £100 and £150. This was based off of the target audience I was and still am designing for, along with benchmarking competitors prices which gave this rough estimation. After analysing Materials and manufacturing costs I was able to devise an accurate costing for each light. Below are the overall costs for each light:

- Small light - £100.25
 - Mid-sized light - £161.03
 - Large light - 161.03
- All subsequent information for how I got to these prices are in my cost analysis sheets.

This cost is subsequent to making 150 units per light to suit the quantity of batch manufacture I have created my lights for. To then get a final pricing which my target audience would pay I then needed to add a profit margin basing that I would only be making 150 units of each entirely as it is meant to be an exclusive piece of furniture therefore the profit margin needed to be a considerable amount in order for it to be a feasible lighting collection. My final pricing for these including a profit margin are shown below:

- Small light - £200
- Mid-sized light - £275
- Large light - £300

Product choice- I initially stated my product choice to be three different kinds of lights being a wall, pendant and table light. After much consideration into time scale and consistency I realised this idea was not feasible to do and I was advised to cut down to 2 ideas. I cut this to a wall and pendant light, however I felt there wasn't enough potential in the idea of a wall light so therefore changed to create a collection of three pendant lights. I felt this was the best option available as not only did it reduce considerations and designs but also gave a more in depth look into my interpretation of stealth over three similar products.



Image 1; showing an example of modern pendant lighting within a collection, with similar iterations with slight differences in overall design such as colour and shape.

Inspiration & Stealth interpretation- Both considerations go hand in hand as they needed to work coherently in order to create the best possible outcome. My inspiration has been influenced by my design manifesto which includes using architecture as influence along with organic design. I have achieved this through creating sketches of buildings and using them within features of the lights. None more so than the smaller light which is inspired the air force academy chapel.



Image 2; Air Force academy chapel

The other two lights have used the organic style area of my manifesto by using crystal formations as inspirations, the sharp formations and long flat surfaces are very similar influence to what my interpretation of stealth is.



Image 3; crystal formation

The use of the term stealth has changed throughout the design process from the literal to the influence. However after much deliberation and consideration I felt that the best way to convey the idea of stealth would be to use it as inspiration using the term coined by the military to be undetected, by using sharp angled features with flat surfaces and dark materials. I initially wanted the light to use the inspiration to direct light in different directions, however I felt there were fewer possibilities in order to use this feature effectively.



Image 4- F-117 NIGHTHAWK
INSPIRATION

Image 5- STEALTH BOMBER
INSPIRATION



Ergonomics- There were 4 areas to consider within ergonomics of my light. Brightness of light, glare, light switch ergonomics and texture. I had decided to keep the brightness of the light to between 800 and 1200 lumen this is ample amount of light to use the light within a living space to provide sufficient spread of light around the room. Glare was found to be a small issue within initial prototyping when looking straight at the product from research from users. (right) we can see a very small amount of glare which gave good reading for the final material which allows less light to run through.

Light switch ergonomics were recommended to be a general light switch at first but ended on being a similar styling to the light a satin black flick light switch.



Image 6- glare on prototype

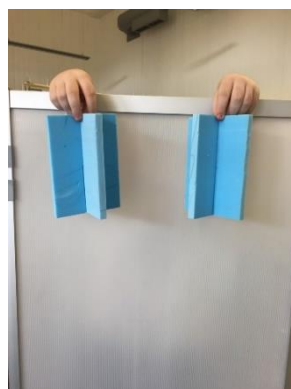
Details- There are a number of details within my lighting, below are all these areas with the decision made for each and a short reason why:

- Wiring – 3 core wire used as there is metal within the final product. Cabling sourced from creative cable rayon black
- Ceiling rose – matte black ceiling rose bought in from creative cables to match wiring.
- Grommet – rubber wiring in top hole to protect cable from wear and tear.
- Strain relief on cabling – Custom made 3-D printed part which is to aid the wiring to hold the pendant light secure once hanging.
- Using general workers to glue and prep my product ready to be shipped out as it brings total cost price down and increase profit margins
- Bulb and bulb holder- No bulb holder needed as L.E.D strips have been used to light the product up and can be glued to frame of the product providing a continuous seam of light.

Product architecture

Sizing and proportioning come into this bracket. I based my sizing's off of two key aspects, being rough dimensions of competitor's products and sizing's of paper and creating models to see what they look like in proportion to humans and objects around.

Images 7-9- initial prototyping testing



These images above are A3, A4, and A6 respectively. I then changed these dimensions slightly to a size I believed where more suitable and be most effective to show my aesthetic features. All sizes are listed below:

- Small pendant light: height=215mm width=155mm thick= 75mm
- Mid-sized pendant light: height=400mm width=319mm thick= 130mm
- Large pendant light: height= 304mm width= 184mm thick= 165mm

Construction- There are no construction aspects for the user to worry about other than installing the light into the wiring system of the home, which I have recommended to get a qualified electrician in to do to wire up safely and securely. All other construction will take place before sale of product.

Materials and manufacturing

There are many repetitions as far as material choice and manufacturing technique for each light. Below I have created a table in order to show every part along with choice of material and its manufacturing process. (For reasoning behind these decisions see development pack. (Project report 1.0))

Small light

PARTS	MATERIALS	MANUFACTURING	QUANTITY (each unit)
Angled pieces	Black frosted acrylic	Laser cut to size and sanded to correct angle using JIG	2 of each part (6 in total)
Outer triangle	Smoked frosted acrylic	Laser cut to shape	2
Frame	Aluminium grade 1050A H14	Metal bent around pre made JIG and one weld seam	1
Grommet	Rubber	Bought in product (see parts list)	1
Cable	Flex round cable with Rayon outer coating	Bought in product (see parts list)	1
LED's	Flexible circuit board with adhesive back	Bought in product (see parts list)	1
Cable strain relief	PETG filament	3-D printed custom made	1
Ceiling rose	Aluminium	Bought in product (see parts list)	1

Mid-sized light

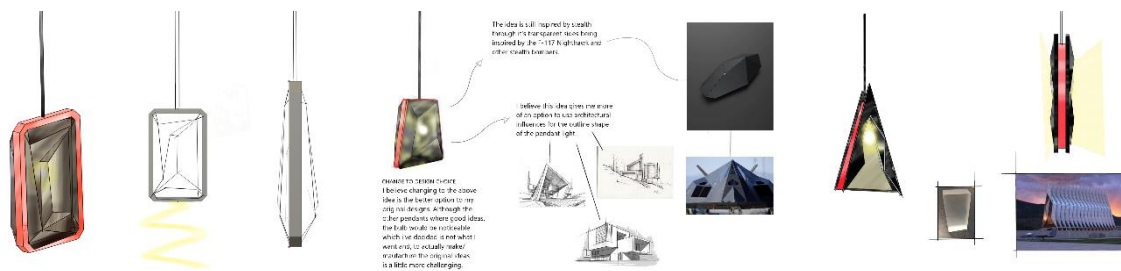
PARTS	MATERIALS	MANUFACTURING	QUANTITY (each unit)
Outer shade shell	Smoked frosted acrylic	Vacuum formed	2
Frame	Aluminium grade 1050A H14	Metal bent around pre made JIG and one weld seam	1
Grommet	Rubber	Bought in product (see parts list)	1
Cable	Flex round cable with Rayon outer coating	Bought in product (see parts list)	1
LED's	Flexible circuit board with adhesive back	Bought in product (see parts list)	1
Cable strain relief	PETG filament	3-D printed custom made	1
Ceiling rose	Aluminium	Bought in product (see parts list)	1

Large light

PARTS	MATERIALS	MANUFACTURING	QUANTITY (each unit)
Outer shade shell	Smoked frosted acrylic	Vacuum formed	2
Frame	Aluminium grade 1050A H14	Metal bent around pre made JIG and one weld seam	1
Grommet	Rubber	Bought in product (see parts list)	1
Cable	Flex round cable with Rayon outer coating	Bought in product (see parts list)	1
LED's	Flexible circuit board with adhesive back	Bought in product (see parts list)	1
Cable strain relief	PETG filament	3-D printed custom made	1
Ceiling rose	Aluminium	Bought in product (see parts list)	1

Aesthetics

The aesthetics of the product is one of the most important areas of my design. It shows my influences from my manifesto being used and my main feature of the product being my interpretation of stealth. The use of angled and shapes flat surfaces along with dark features become pivotal in the success of the design. As stated in my project report 1.0 I asked a group of people to choose their favourite three designs out of 10 options. All three options I had decided to use as my final designs in my collection where all chosen by one of the members of the target audience. They were also my favourite three ideas personally which made it all the more enjoyable to continue to develop and make. Below are the ideas initially which haven't changed much as far as aesthetics other than the 1st design having a thinner outer frame.



Images 10 and 11 from sketching files

These ideas portray the interpretation of stealth well as you can see from the sketch pages the use of the aircraft and mouse is very apparent in the large and mid-sized light. The small light follows the inspiration of architecture as stated earlier whilst using part of the Air Force academy chapel.

4. MARKET AWARENESS

Market awareness was able to be split into four categories to understand the market to a higher level, these areas being:

- My target audience
- Where the collection could be sold
- Environment
- Personalisation and exclusivity

My target audience

Initially my target audience was to be for 20-50 year old modern homeowners who had a variable income. This idea has stuck all the way through the design process and been what I have been basing some of my products key aspects off of. Here I have some key characteristics relating to the target group in mind which aided me in my design process.

Characteristics: 20-50, varied financial status. Younger homeowners are more likely to purchase homes which have more recently been built so have a more modern exterior and interior styling. Although normally quite small homes with 2-3 bedrooms as they may not have the financial capabilities to be able to purchase anything larger. My sister who falls into this category has recently purchased a semi-detached home which has a more modern feel with contemporary features running throughout, however some areas are still considered, traditional/rustic including the log burner fireplace.



Images 12 and 13 from initial research

Where the collection could be sold

As my lighting collection has been designed to be a bespoke collection, I will be able to sell the product at a bespoke lighting company who sell high quality products. Companies like Tom Dixon and Tom Raffield and Chantelle lighting are where I believe the lights could be sold and suit there styling.



Left is an example of the kind of pendant light sold at Tom Dixon which is sold for £755. Right is an example of light sold at Chantelle lighting selling for £690.44. Images 14 and 15 found on respected websites



Environment

My Environment has been something which has stayed the same throughout the design process I initially stated that it would work in a living space well, however I do believe the lights could be put throughout the home in order to keep a continuous design style in every room. Not only did I decide what room I would recommend the light go but also what style of interior I would put it in with. This style being a mixture of modern and contemporary styling, which are very similar to each other in some ways. This style works well as the styling of the lights were determined to be sleek and modern therefore will use similar characteristics to each other in order to complement one another as suggested earlier.



Image 16 showing the kind of room the light will be in which also uses a similar style to what is suggested to go with the light.

Personalisation and exclusivity

In order to make the light more appealing to the target audience I devised a strategy which allows them to customise the light by adding a personalised engraved writing to an area of the light (suggested the top of the light) By doing this it allows the customer to feel like they have got a 1 off product which only they will have with that particular engraving on. Which in turn makes the product more appealing to members of my target audience. As I have said the quantity of each unit made will be 150 each will have its own vin code (1 to 150) Meaning the customer feels a part of an exclusive club of people who own one of these limited lighting products which can not only increase profit margins but also sales in order to get an earlier model than another.

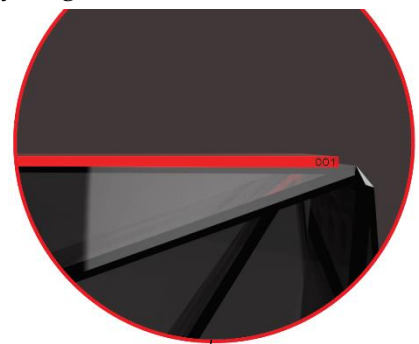


Image 17 taken from one of my boards

5. SUSTAINABILITY

My final designs do not address sustainability at a very high level, as the lights are made for bespoke lighting companies who leave no expense spared in regards to quality and materials. I have similarly tried to mimic this in my designs. However there is a small amount of consideration toward this issue. I have chosen a suitable lighting option, being L.E.D strips which are an excellent long lasting option which contributes well to the issue at hand. I also have placed a 5 year warranty on the lights themselves (the L.E.D's) so if a problem does happen to occur within the normal life span of strips then the customer can simply send the light back and I would then replace the L.E.D's and re seal the whole project. This meaning that the product isn't getting thrown away in a short period of time helping toward reducing the risk of completely throwing the product.



Images 18 and 19 both from websites

6. PERSONAL DESIGN MANIFESTO

Firstly, let's remind ourselves of what my thinking has been and discussed in the manifesto. Below are all four categories of beliefs I like to follow as a designer with a brief explanation for each.

- Captivate- "Attract and hold the interest and attention of; charm. 'He was captivated by her beauty' (Oxford Dictionaries | English, n.d). As the dictionary meaning suggests, I intend to make consumers focus solely on my product-to be transfixed by the aesthetic of the particular product". (From my personal design manifesto)
- Architectural influences- Using architecture as an influence when in the design process, do for initial sketching and development primarily.
- Purpose and process- When designing any product there should be a particular design process used in order to create a product which has purpose.
- Organic design-"Style of product design which takes as its starting point organic, flowing natural forms" (User and Emami Design, n.d.). "Organic design was pioneered by Frank Lloyd Wright who believed in creating harmony between people and nature" (Museiitaliani.org, n.d.). Two quotes, which I believe, sum up organic design perfectly and should be used when designing a product. (From my personal design manifesto)

I have used all four of my manifesto beliefs effectively during the process of creating the lighting collection. Architectural influence was used within the sketching of initial ideas. As seen in the image below my small light derived from the Air Force Academy Chapel building.

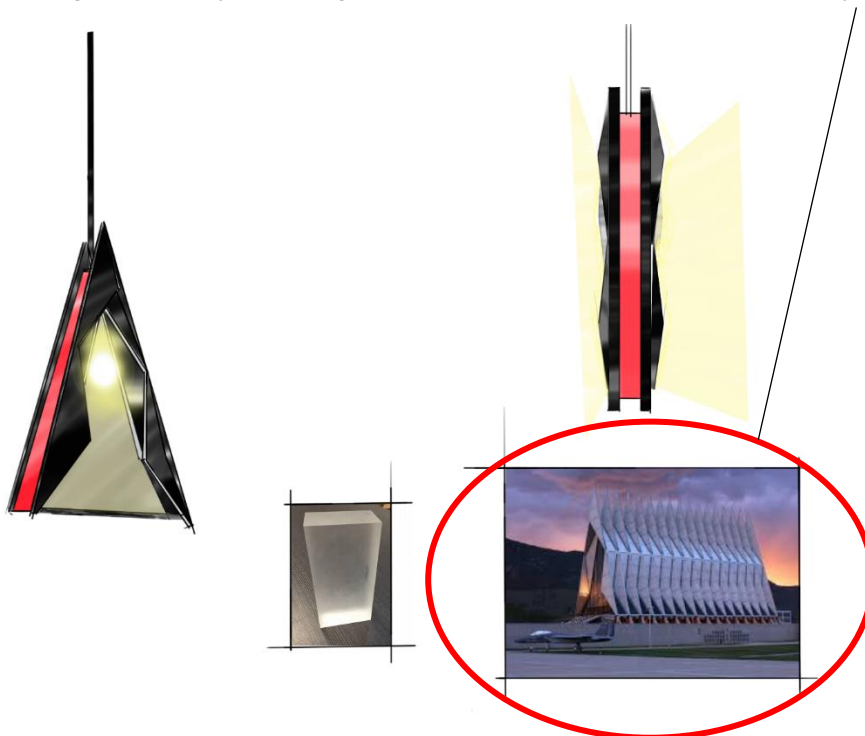


Image 20 from sketching files.

In my opinion the project itself is captivating when hung up and lit, your eye will immediately be drawn to its intriguing lines and shapes and overall aesthetic. It will be equally captivating when off as the interpretation of stealth can really be appreciated at this time.

In order to get to my final designs I have used a particular design process from sketching and development to model making and final prototype. This process has then allowed me to create a fully developed idea and lighting collection which serves an important purpose of lighting a room up and in particular a living space/area.

The final manifesto belief of mine is organic design. Using the outside on products in, it took me a while before being able to add this area within my design however when realising that crystal formations had similar characteristics to those of my interpretation of stealth I would then be able to use this to my advantage in order to create a beautiful final outcome. As you can see below in my mid-sized light it's very clear how this has been used within the main section of the shade. A crystal relates to organic design as they are found in nature/outdoors.

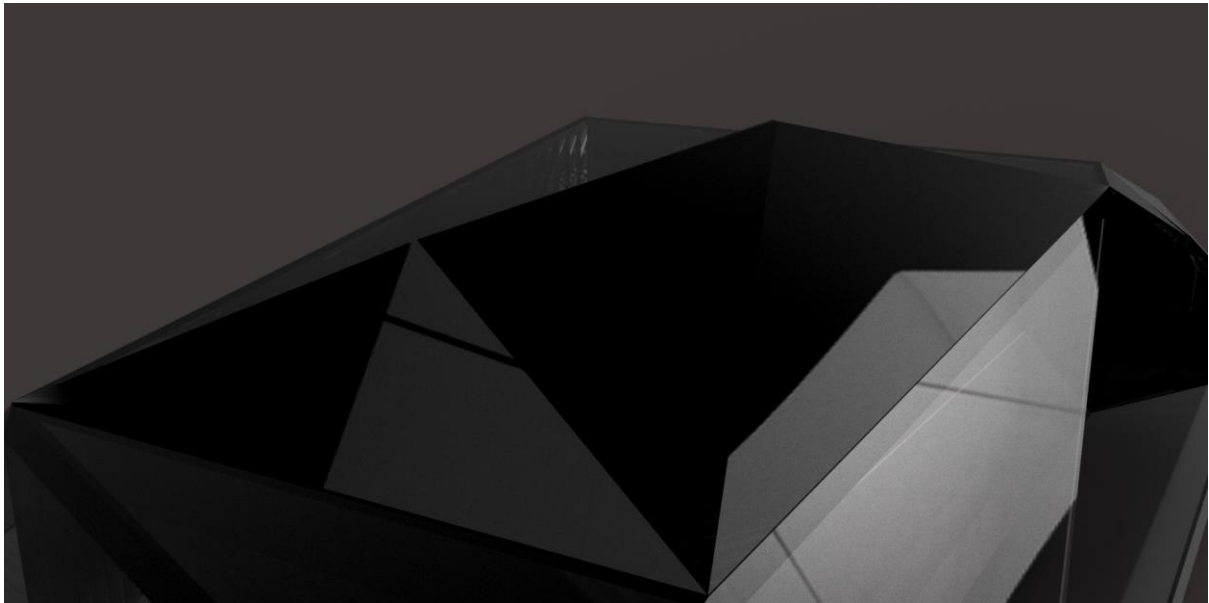


Image 21 of one of my renders in Fusion 360

7. CONCLUSION

To conclude, in my very first presentation on my major project I discussed how I wanted to investigate the meaning of stealth and how I could apply it to product design (within some kind of furniture/appliance/watch). Now with a fully derived project I believe my stealth lighting collection has achieved my initial problem. I found my own interpretation of stealth which was to use the military's definition and then apply it to a product being a set of lights. This has given me a beautiful product outcome and I was able to use my design thinking to its full potential in order to get this quality of design. I believe my design pushed the boundaries of manufacture in order to create such an intricate and clever shape, which is something I have not seen before.