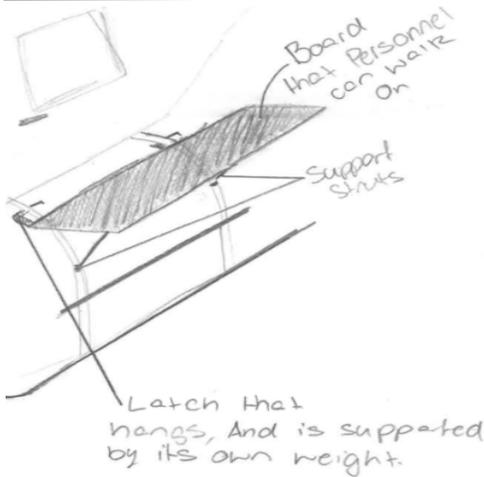


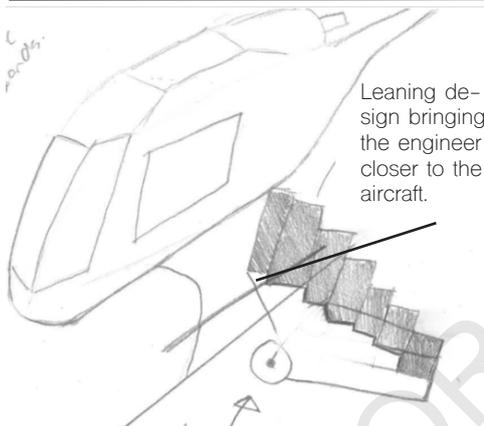
Ideas Generation: Thumbnails

Thumbnail #1:



This thumbnail depicts a board like structure that attaches to the cross tubes of the helicopter. The design has a main attachment point that attaches to a fixed latch that is clamped on both cross tubes. Support legs then brace the design off of the bottom of the cross tubes. This design does show some potential as it has a relatively flat design that can be used for flat packing and therefore making the design more versatile. For this reason this design will continue to be refined.

Thumbnail #2:



This design shows a set of movable stairs that have a lent design that is able to hang over the skids of the aircraft. There is a large set of wheels enabling the product to be wheeled over rough and bumpy ground. The design is not compact enough to be considered versatile however as it cannot be moved from facilities with ease. For this reason this design will be excluded from and further designing and/or refining.

Large wheels enabling the design to be wheeled over rough terrain.

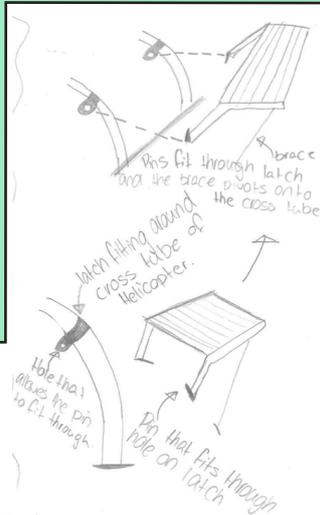
Thumbnail #3:



A similar design to Thumbnail 1. This design gives a larger area of walking space for the engineer to walk upon. This design shows a collapsible hand rail increasing the safety of the personnel. This design shows an extension on the walk plank that extends past the rear cross tube giving the engineer greater access to the engine bay and transmission, While the design appears to be bulky it will be considered in further designs. Because this design gives increased safety to the personnel it may be considered in initial concepts.

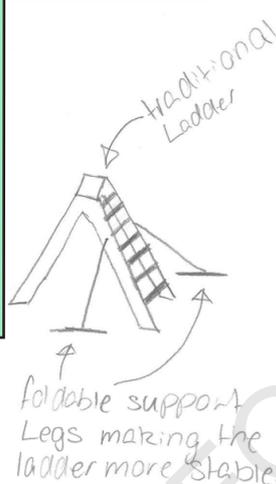
Ideas Generation: Thumbnails

Thumbnail #4:



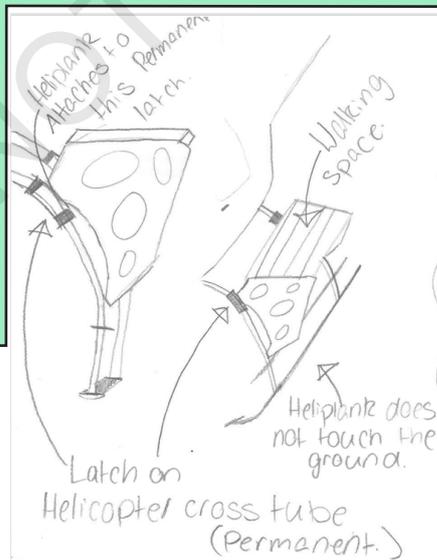
This design clearly shows a latch design that is fixed on the cross tubes of the helicopter allowing a pin structure that is fixed on the plank to fit through the latch and pivot off of this point. This gives greater versatility to the product which targets the criteria to evaluate success. It does not however give as good an area for an engineer to walk upon.

Thumbnail #5:



This design proposes a traditional ladder with leg like accessories that attach to the ladder increasing the stability of the product. These legs are fold-able allowing for a versatile product. This design may not eliminate the risk of falling to the personnel as it provides the same level of working space as a traditional ladder. For this reason this design will not continue to be developed into a more refined product.

Thumbnail #6:



Again utilizing the stability of the helicopter itself, this design also has a fixed permanent latch that allows for two geometric shapes to attach and pivot off which then come into contact with the cross tubes lower down, bracing off the cross tubes. A plank like structure can then be fixed to these structures allowing for the personnel to access the engine bay and transmission. This design is allowed to disassemble allowing for greater versatility which will be explored in future drawings.

Ideas Generation: Initial Concepts

Ongoing Evaluation

Through the 6 thumbnails presented and annotated, I have been able to determine which designs may need to be further developed and redesigned in the later parts of the ideas generation stage. It has also proposed some questions that I must fulfill to be able to develop the most effective solution to this problem. This includes questions such as, where is the most effective position for an engineer to stand?, And how portable does this design need to be to be effective?

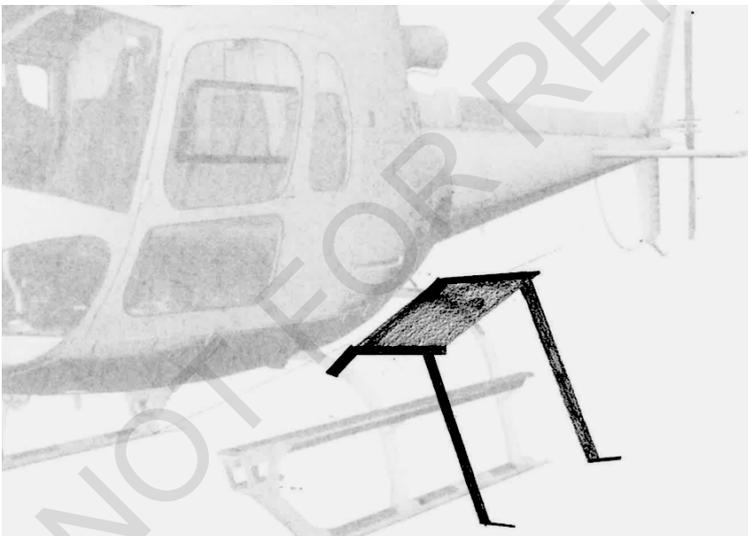
Application of Conclusion

From the 6 thumbnails I have determined that the designs that need further consideration is designs 3,4 and 5. These designs are the most promising in being able to fulfill the design criteria of the final design.

Legend:

Positives: ● Negatives: ● Improvements: ↗ Selected design: —

Initial Concept # 1: Raised platform with ground support legs:



● The design is more stable than traditional ladders and there is no threat of damage to the helicopter.

● The design may still not be as stable as it still needs to come into contact with the ground, hence if the aircraft is not situated on even ground this design will not be level.

Justification:

This design proposes a lean-to concept where the long back arm of the of the design touches the ground. However it can be seen that it is also attached to the cross tubes of the helicopter providing greater stability by utilizing the helicopter as a base.

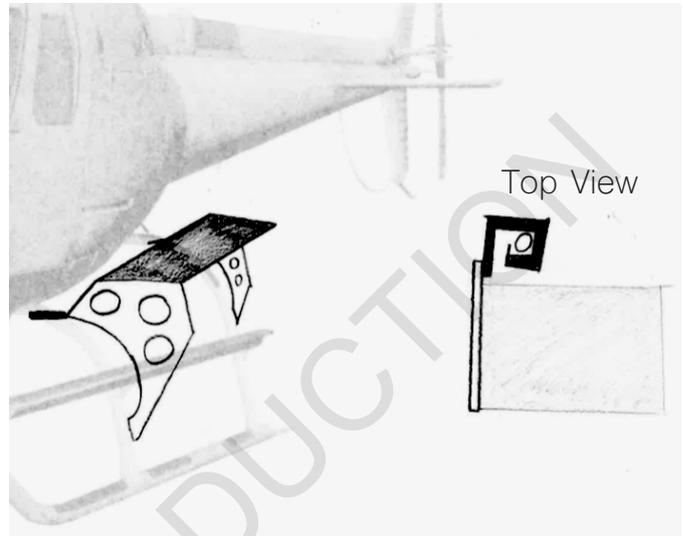
Ongoing Evaluation

The increased stability in this design means that it fulfills some of the criteria. However it is unknown if this method will be effective so this design will not be developed further.

Ides Generation: Initial Concepts

Initial Concept #2: self Counter levering platform

- The design does not require a fixed piece of equipment on the helicopter.
- This design may be configured to be able to be dismantled where the plank detached from the two side structures, thus increasing versatility and maneuverability.
- This design is very easy to set up.



- It is unknown whether the unfixed, curled metal bar will stay in the correct position or whether it will slip.
- If left unrefined the design is bulky.

- An improvement for the design will be investigating measures that will hold the design in a fixed position without needing a fixed piece of equipment on the helicopter.
- Detachable methods so the plank and side structure can come apart easily could be investigated to increase versatility.

Justification:

The off-the-ground design will increase the stability of the product which addresses the need. The product is held on the helicopter by counter-levering off the cross tubes via hooked metal structures on each side piece.

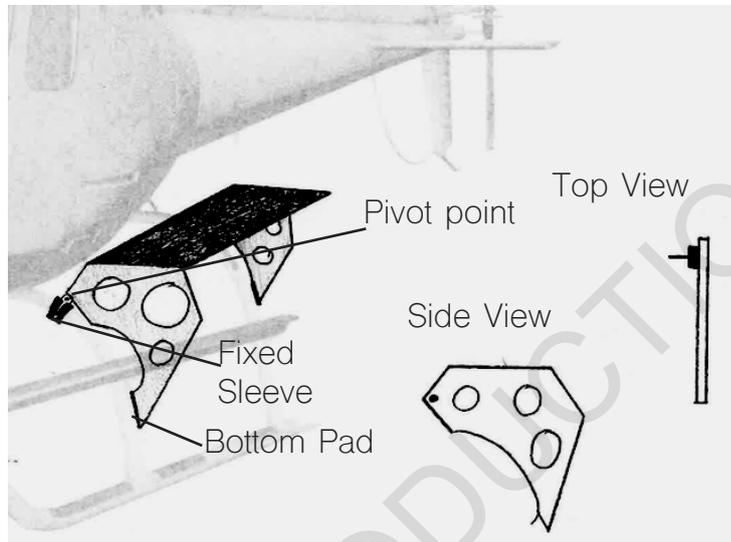
Ongoing Evaluation

This product addresses many points of the need by eliminating instability. Further evaluation of the product may be needed on its size and its attachment method. Upon reconsideration, the hooks like structures that hook around the cross tubes, allowing for the side structures to counter lever off the base of the cross tubes will not be effective in holding weight, as there is potential for the side structure to slip.

Ideas Generation: Initial Concepts

Initial Concept #4: Counter levering platform from fixed sleeve.

- The design will be stable and it provides a direct view to the engine bay
- This design can be further configured to be dismantled in parts. The side structures detach from the helicopter and the plank also detaches. This can increase the versatility.



- The design could be bulky if not refined further.
- It is unknown if the saddle clamp that will attach to the side of the helicopter will be strong enough to hold the weight of an engineer without slipping.
- It will have to be investigated if torsion will mean that the design breaks as its only attachment point is the pivot point on the sleeve.

- An improvement for the design will be investigating measures that will hold the design in a fixed position.
- The correct materials must be researched and chosen as there is a risk that the use of the product will result in the side structure bending.

Justification:

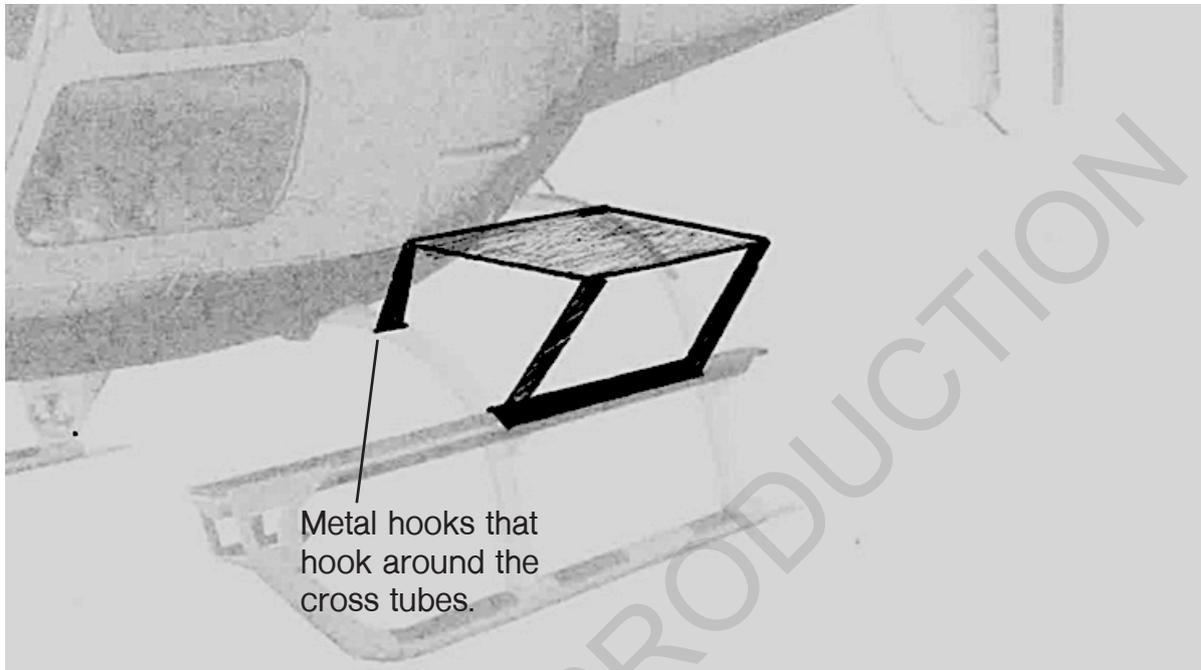
The off the ground design will increase the stability of the product which addresses the need. The product is held on the helicopter by counter-levering off the cross tubes via a fixed mount.

Ongoing Evaluation

This product addresses many points of the need by eliminating instability. Further evaluation of the product may be needed on its size. Research into correct materials and further development of the pin locking system on the sleeve will be completed in the design direction stage.

Ideas Generation: Initial Concepts

Initial Concept #3: Self Counter levering platform with Safety bar



Justification:

The product is held on the helicopter by counter-levering off the cross tubes using metal hook structures.



It is unknown whether the unfixed, curled metal bar will stay in the correct position or whether it will slip. Thus the design is very prone to slipping,



- It does not require a fixed piece of equipment on the helicopter.
- The design can be attached to the aircraft simply and easily.

Ongoing Evaluation

This product addresses many points of the need by eliminating instability. Due to the size of this product, it will not be further developed. As the product cannot be minimized in size it will not be further explored as this inhibits the design from fulfilling the criteria of being versatile.

Ideas Generation: Initial Concepts

Initial Concept #5: Movable stairs that brace off helicopter.



● This design shows increased accessibility and stability as it attaches to the helicopter itself. The large wheels enable it to be moved over most surfaces.

● The design is very large meaning the versatility is very low. This design cannot be transported easily from place to place.

Justification:

This design shows a set of movable stairs with large wheels making it easier to move over rough terrain. The stairs then attach to the cross tubes of the helicopter which increases the versatility and fulfills part of the criteria.

Ongoing Evaluation

While this design does increase safety and stability it does not fulfill the criteria of being versatile. Therefore this design will not continue to be developed in later stages of ideas generation.

Ideas Generation

Initial Concept #6: Raised Platform Structure



This design has focused on improving the stability of the work platform. It is stable due to the large spread out support struts.

- This design may still be unstable if the ground it is sitting on is unstable. The design is also difficult to set up as it involves placing the legs close to the helicopter which may result in damage if it gets hit.

Justification:

This design shows a ladder like structure held by legs. There is a large platform that was designed to give the engineer increased access which conforms with the criteria. The structure is free standing meaning it may be able to fold, increasing versatility.

Ongoing Evaluation

Because of the design's instability as it is supported by legs which may not be situated on even ground, this design will not be continued to be developed in later stages of ideas generation.

Evaluation of Initial Concepts.

Ongoing Evaluation

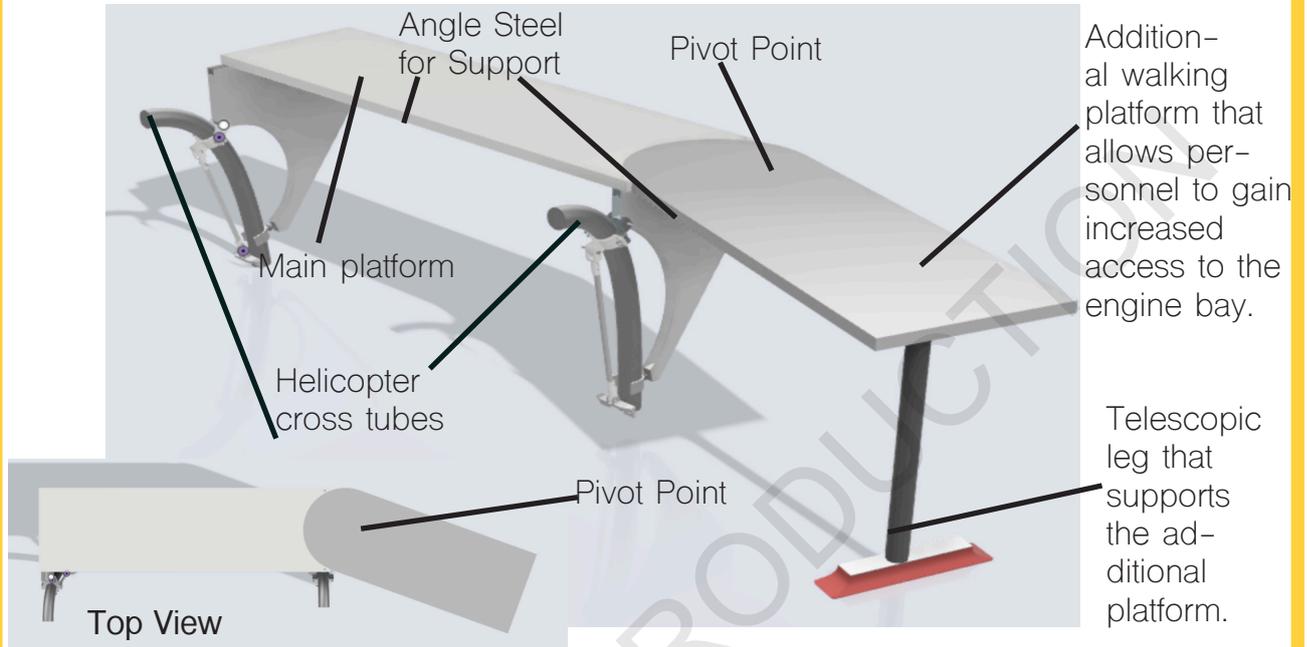
It can be noted that the most effective design style in complying with the criteria to evaluate success is the self counter-levering design. This includes designs 2 and 4. This method of attachment to the aircraft utilizes the helicopter as a stable base from which a platform can be attached. This form of design is most effective in mitigating risk to the engineer and being a versatile and move-able product. Research will need to be taken in order to determine the most effective attachment method to determine whether the fixed sleeve of design 4 or the self countering hook design of design 2 will be used. An improvement for both of these designs will be an increase in the versatility to better address the criteria to evaluate success.

Application of Conclusion:

Further investigation into initial concept designs 2 and 4 will occur in the design direction phase of the ideas generation section to determine the most appropriate design that will be used in the final design. The fixed sleeve/saddle design and the self countering hook design will be investigated in order to produce a product that will maximize its ability to mitigate risk to the engineer and increase the versatility of the product.

Ideas Generation

Design Direction #2: Pivot design



Justification

The purpose of this design direction was to allow an extra plank that attaches to the main plank to pivot and rotate, allowing the extra plank to fit the profile of both sides of the helicopter. From research #1, it was found that the engine is situated at the base of the helicopter tail. The extra plank needs to follow the profile of the helicopter as it is a tear drop shape (top view of helicopter is a tear drop shape) on both sides interchangeably and the pivot of this design allows the extra plank to swing to fit both sides.

Ongoing Evaluation

This design is an effective concept in allowing the personnel to access the engine. However there are concerns over the strength of where the extra plank attaches to the main plank.

Positives:

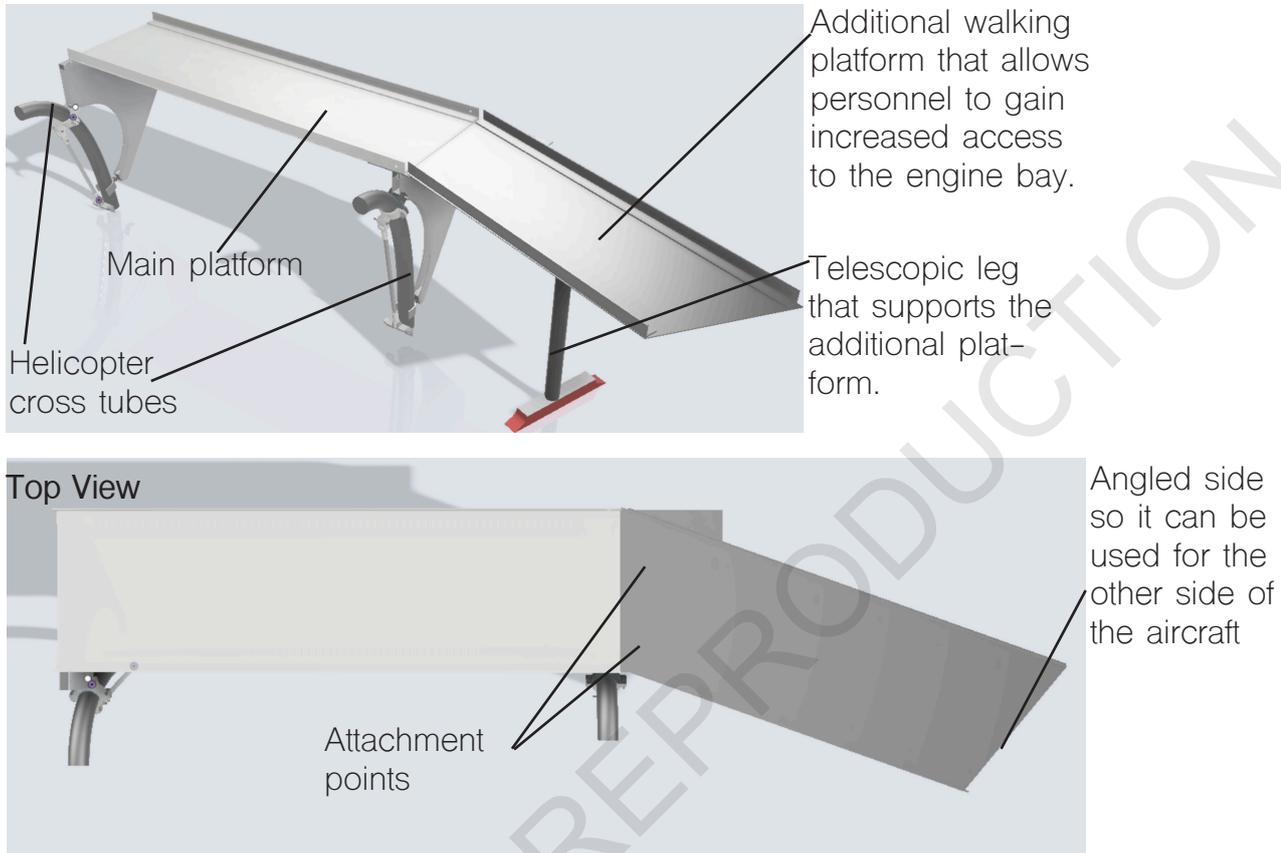
- This design allows for a high level of access to the engine situated past the rear cross tube.
- The pivot allows for the necessary degree of rotation of the extra plank which is beneficial to the type of task that is needed to be completed on the engine.

Negatives:

- It has been found that there is a weakness in this design where the extra platform attaches to the main platform. It has been identified that there is a risk for plank to bend as the majority of the weight of the personnel will be distributed onto the aluminium platform and not the right angle supports.

Ideas Generation

Design Direction #1: Fixed Plank design



Justification

This design was developed following on from initial concept #4. It uses a fixed mount design that is used to attach each side structure to the cross tubes. There is a main plank and an additional plank that is fixed to the main plank. This additional plank is quick release, notice that the end of the plank is angled in so when this is needed on the other side of the helicopter, the plank is simply turned around and the other end of the plank is used to attach to the main plank.

Ongoing Evaluation

This design gives a promising solution to the problem by allowing increased access to the engine bay. However, it is not as streamlined a design as Design Direction 1 and so the development of this design solution will stop at this point.

Positives

- Provides an additional plank for personnel to have increased access to the engine bay.
- The design is quick release and is able to be flat packed.

Negatives:

- The design is not refined and there may be a strength issue regarding the telescopic leg which has had to be placed in the center of the additional plank as the plank must be turned around to fit both sides.

Project Development and Realisation

Evidence of Creativity: Logo Development

Initial Research



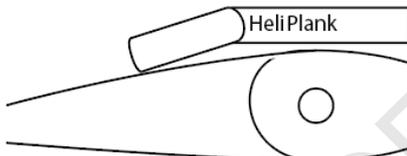
Ongoing Evaluation

It can be seen that most of the logos in the industry include a reference to a helicopter image or the rotor head and blades of the aircraft. This may be a good thing to include in my own design as it is relevant in the industry.

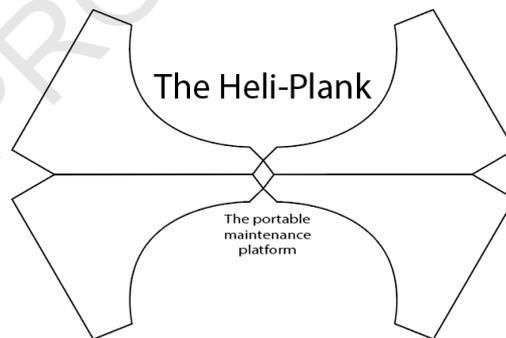
Initial Concepts



1



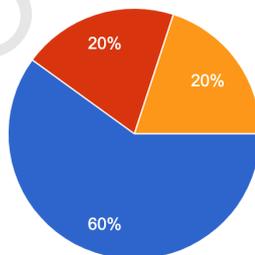
3



Survey results

Which Logo do you think is the most appropriate for the Heli

15 responses



- Option 1
- Option 2
- Option 3

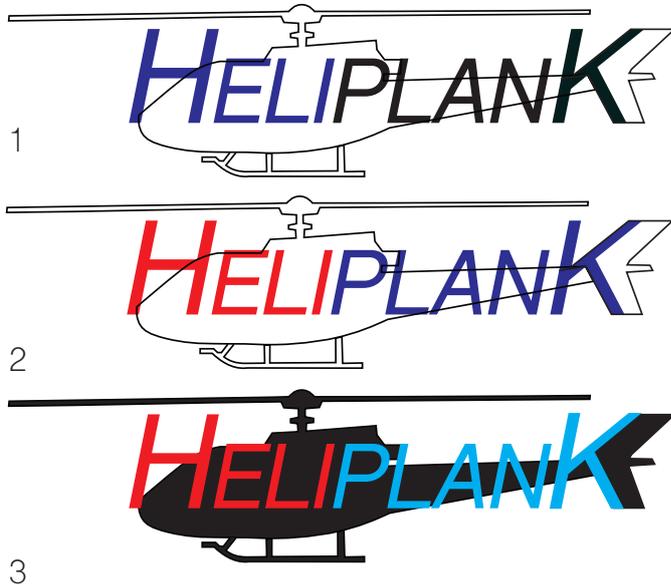
From the survey, it can be concluded that option number 1 is the most popular among the people surveyed. This design clearly shows what the product is related to. Option 2, was designed to reflect the unique shapes of the side structures, and this was equally liked as option 3 which is a birds-eye view of the helicopter with the heli-plank attached.

Ongoing Evaluation

By using a survey sent to the engineers and pilots of Sydney helicopters, I was able to effectively analyze the target market and determine which logo was the most popular.

Evidence of Creativity: Logo Development

Variation of the Initial Concepts:

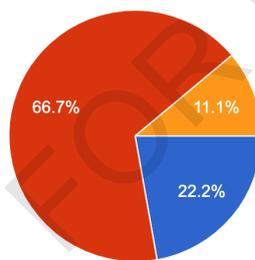


Upon the selection of the first logo design, 3 variations of the design were created and are shown to the left. This was only completed for the chosen design to save time, hence the survey was completed in two steps, the first to determine the design, and the second to determine the colours and other aspects.

Survey results

Which Variation of this logo is the most appropriate?

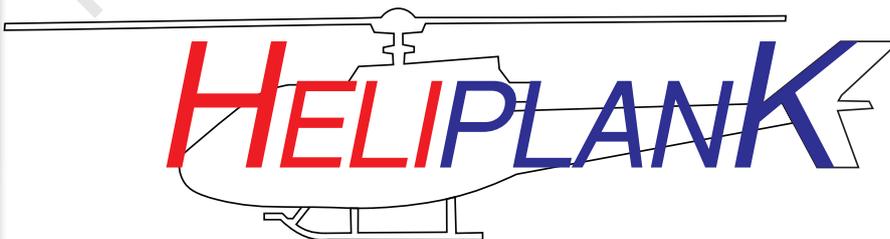
9 responses



● Option 1
● Option 2
● Option 3

It can be seen that, from the survey, the most popular design was the 2nd option. This design shows a simplistic design, however it is eye catching due to the bright red and blue letters, while still being professional.

Final logo Design



Ongoing Evaluation

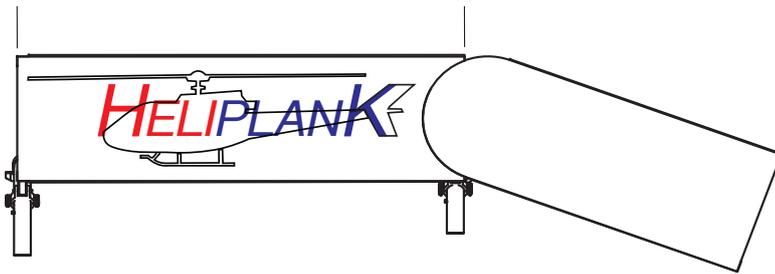
After asking peers and people in the industry, it has been determined that this design is the most aesthetically appealing. The positioning of the name references the product. This will be used on the product in some form.

Evidence of Creativity: Logo Development

Positioning of the Logo

Purpose: The positioning of the logo on the product will influence how the logo is seen and therefore the brand awareness of the product. Effective placement will ensure that viewers and spectators have a clear view of the product name, capturing attention which leads to increased interest in the product.

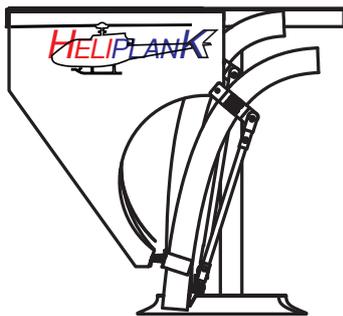
Initial Ideas for Logo positioning:



This idea shows the logo positioned on the walking plank of the Heli-plank.

- The logo is very large and readable.

- The logo would be difficult for viewers to see once the plank is set up

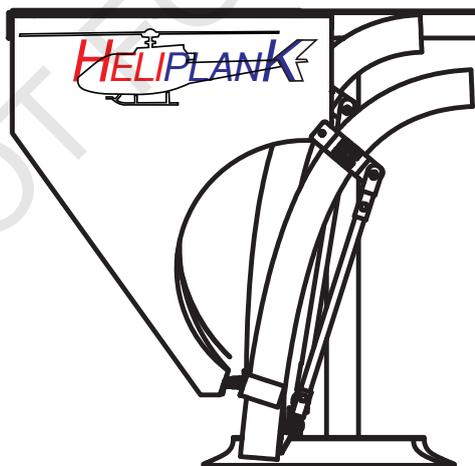


This design shows the Logo positioned on the front side structure.

- The logo would be very readable and visible to viewers when it is set up on the aircraft.

- When dismantled, this logo would be difficult to see.

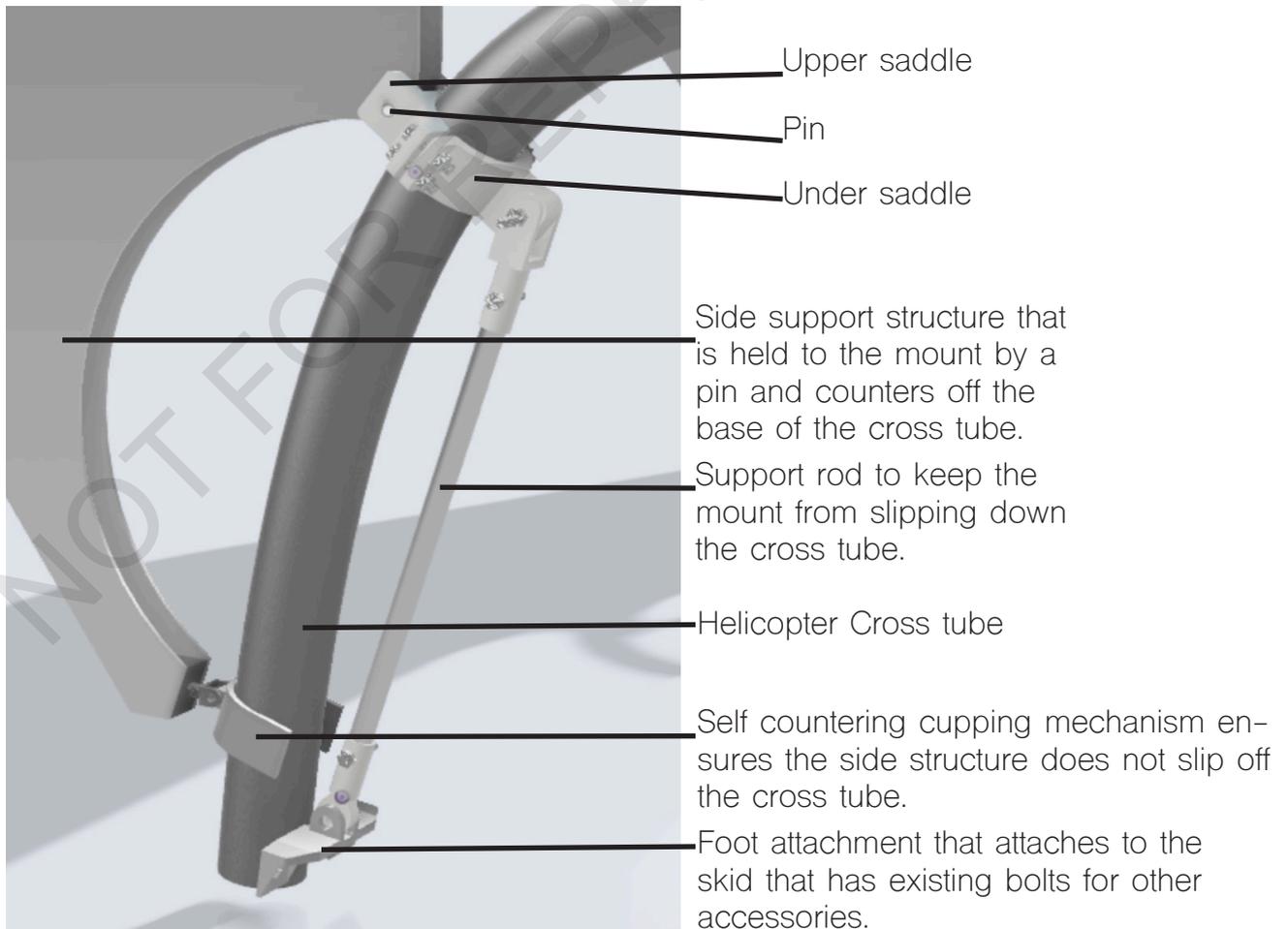
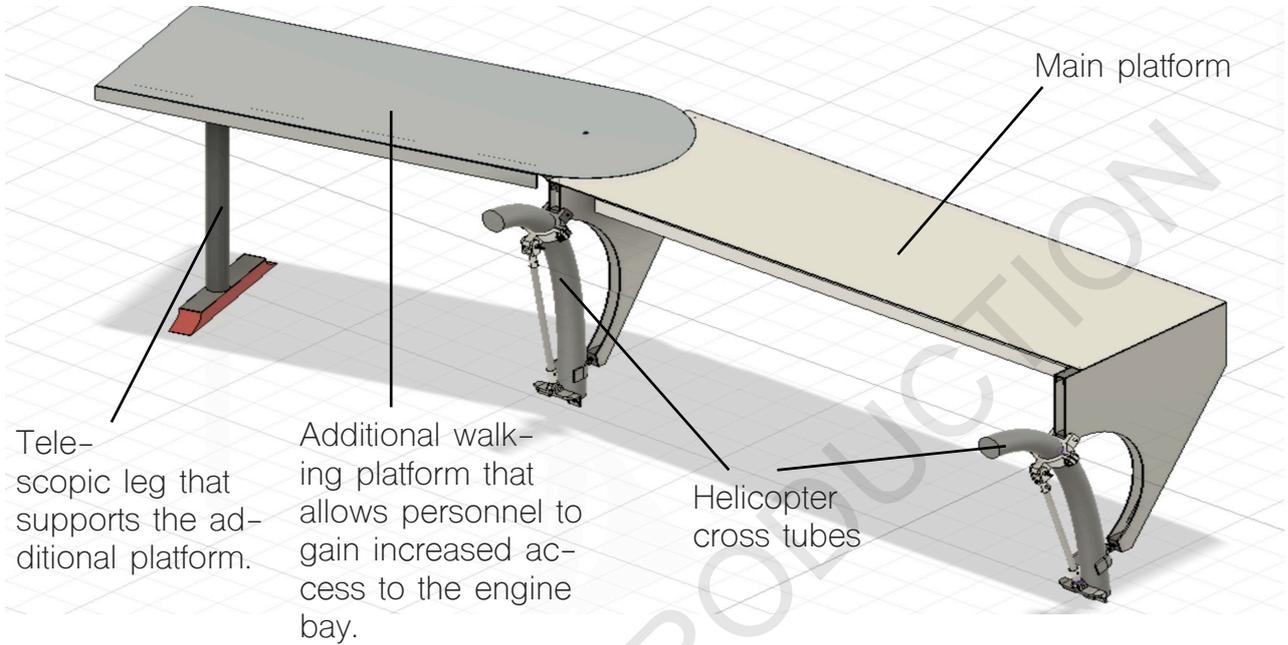
Final design



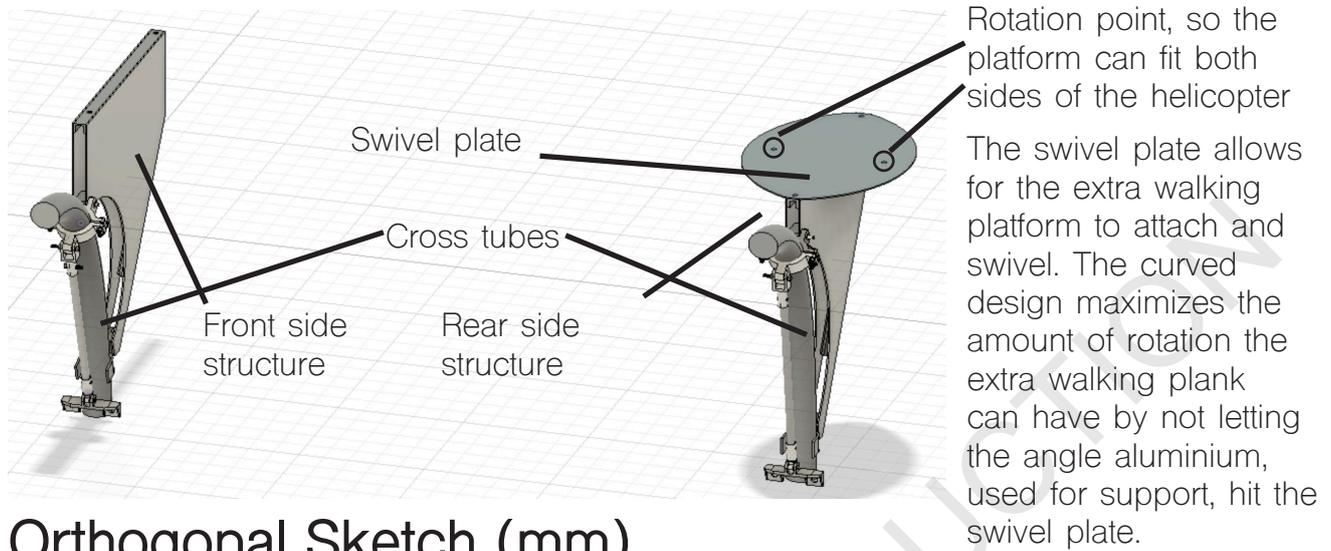
This design was chosen from the two concept ideas above. This is because, the logo is clearly represented to viewers, promoting the product. As the primary use of the product will be when it is assembled, the lack of logo presentation when the product is disassembled, will not harm the promotion of the product.

Final Design Drawings

Rendered Drawings



Final Design Drawings



Orthogonal Sketch (mm)

