

ABSTRACT

While relaxing on a beach or at a public pool, there is no commonly accepted solution to the lack of secure storage for phones and wallets that is both highly convenient and sufficiently secure. The Portable Charging Unit now referred to as the Secure Resort Table is a solution to this problem that can be implemented by resorts with either beach front or pool side options.

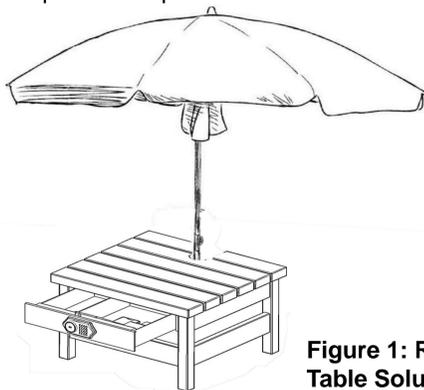


Figure 1: Resort Table Solution

CUSTOMER NEEDS/SPECS

As the design process went on some design refinements were needed and not every specification was able to be met. Table durability was well above expectations and the weight exceeded the 40 lb limit set earlier in the year.

Needs	Specifications
Storage	Storage space can be locked
Weather Resistance	Fixed pole diameter (between 1.5"-3")
Security	Lock durability (> 7 lbf)
Durability	Table durability (> 200 lbf)
Ease of Maintenance	Weight (> 40 lbs)
Ease of Use	Storage size (at least 200 cubic in)
	Installation time (< 2 minutes)

DESIGN CONCEPTS

The hinged box was an outdoor-weather safe that can be accessed by entering a keypad code. The back section hinges to secure around an umbrella pole.

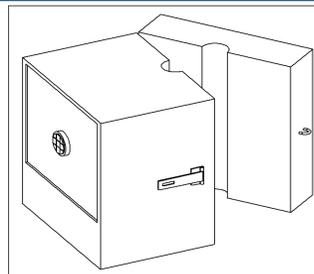


Figure 2: Design Concept Hinged Box

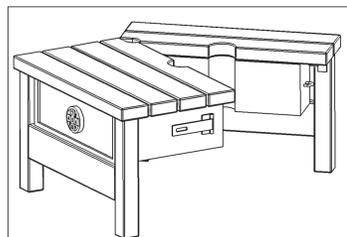


Figure 3: Design Concept Hinged Table

The wooden hinge table utilizes a back weighted section that clamps around a beach umbrella pole.

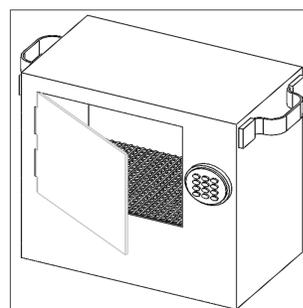


Figure 4: Design Concept Portable Safe

The portable safe design had handles to be portable and was intended for individual use.

FINAL DESIGN



Figure 7: Final Design 3-D Model

Features:

- Keypad lock operation
- Ergonomic handles to open/close drawer
- Umbrella clamp latch to easily attach or remove table from umbrella pole
- Umbrella table slot to hold umbrella in place
- Various heights/colors available

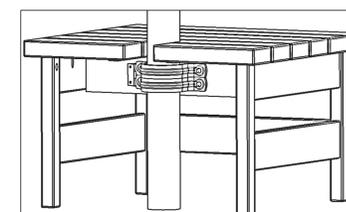


Figure 8: Umbrella Latch Closed

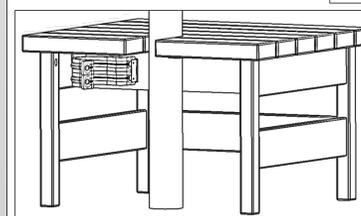


Figure 9: Umbrella Latch Open



Figure 10: Medium/Red Variation



Figure 11: Tall/Green Variation

CONCLUSION

Over the six phases of the project, the team researched existing patents, brainstormed ideas, created concepts, revised designs, and built the final design that accomplished the needs given to the team from the sponsor. The goals were changed from a portable charging storage solution to creating a secure storage option for customers while relaxing at the beach resort that was aesthetically pleasing and fit in the environment.



Figure 12: Final Design Mock Set-up

LESSONS LEARNED

This project gave the team perspective on project management as well as practice in a design project. Team roles and communication were two things the team quickly realized needed to be solidified. The team also experienced challenges with time management and how to get back on schedule to meet deadlines. Finally, the team learned that it's easy to overcomplicate a solution to a problem and that sometimes the best solution is a simple one.

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TESTING

Simulations were used to create a couple studies in SolidWorks. The studies conducted would test if a leg would buckle when kicked and if the tabletop could withstand a person standing on it.

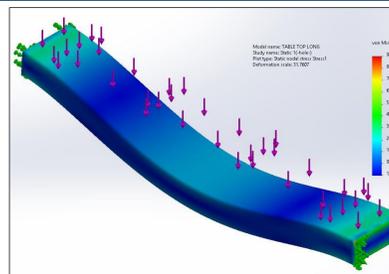


Figure 5: Von Mises Plot on Tabletop

Physical testing was also completed, such as standing on the table, to verify that the Resort Table design was durable and met the established needs the team set.

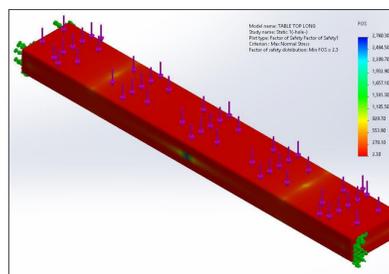


Figure 6: Factor of Safety Plot on Tabletop