

Military Mobile Dog Kennel

Army Research Office

PROBLEM STATEMENT

Objective #1: Research current mobile kennels and kennel technology and present options that potentially satisfy the project requirements.

Objective #2: Design and prototype a collapsible, mobile, and portable kennel system capable of protecting and moving one MWD in a hospital/clinic setting.

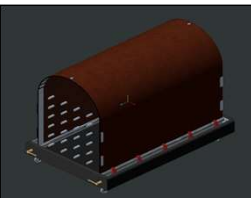
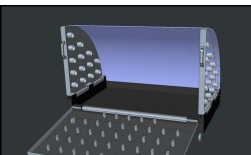
Objective #3: Determine possible materials that could be utilized in a manufactured version, focusing on cost, durability, and noise abatement.

REQUIREMENTS

#	Description
1	Kennel weight of around 50 lbs.
2	Kennel materials are dog safe.
3	Assembly and disassembly in less than 5 mins.
4	Reduces noise by at least 10%
5	Collapses to at least 50% of its size

CONCEPTS

- Created 12 concept designs
- Experimented with different materials such as: tear proof fabric, anti-microbial fabric, and engineering plastics to reduce kennel weight.
- Discussed design with sponsor and customer base to guide design decisions.



FINAL DESIGN, APPROACH, PLAN

- Top and bottom trays made of aluminum
- Walls made from Acrylic
- Side swinging door with a latch
- Folds up using hinges
- Walls lock with butterfly clips
- Dimension: W 34" x H 36.5" x L 43"



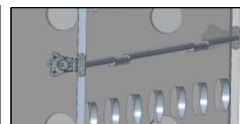
Kennel fully assembled



Kennel collapsing

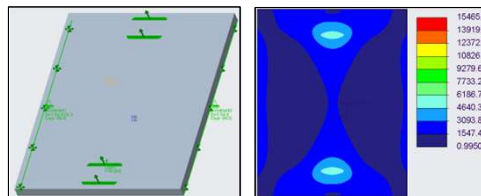


Kennel fully closed



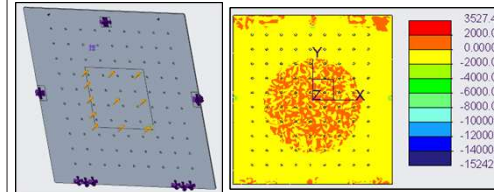
Side panel attachment

Aluminum Roof FEA:



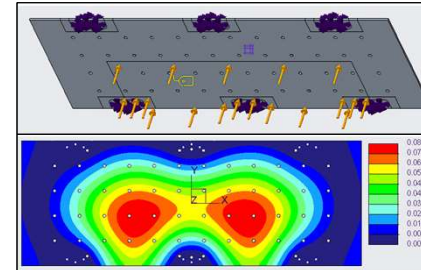
Roof Loading Conditions and Von Mises' Stress Distribution (psi)

Acrylic Rear Panel FEA:



Rear Panel Loading Condition and Minimum Principal Stress Distribution (psi)

Acrylic Side Panel FEA:



Side Panel Loading Condition and Displacement (inch)

FEA simulated the material response to expected loading cases of each kennel component. Results of FEA, aided in development of final design and ensure a safe kennel.

Kennel Fabrication:



RESULTS



FUTURE WORK

- Scaling: Work on the size of the kennel potentially making it smaller
- Materials: Different materials or different thicknesses of materials
- Loading Conditions: Current expected loading may be unrealistic and to large.
- Fabrication methods: Design for the process
- Remodeling: Size and amount of airholes
- Weight: Needs to weigh less, possibly by scaling it down, different materials for the walls, changing out some of the bolts with rivets, different wheels,

TEAM & ACKNOWLEDGEMENTS

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