

ASEN 2004: Vehicle Design and Performance

*Aero Lab Milestone 2 Individual Glider
Design Concept*



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Aircraft Design Geometry and Key Parameters

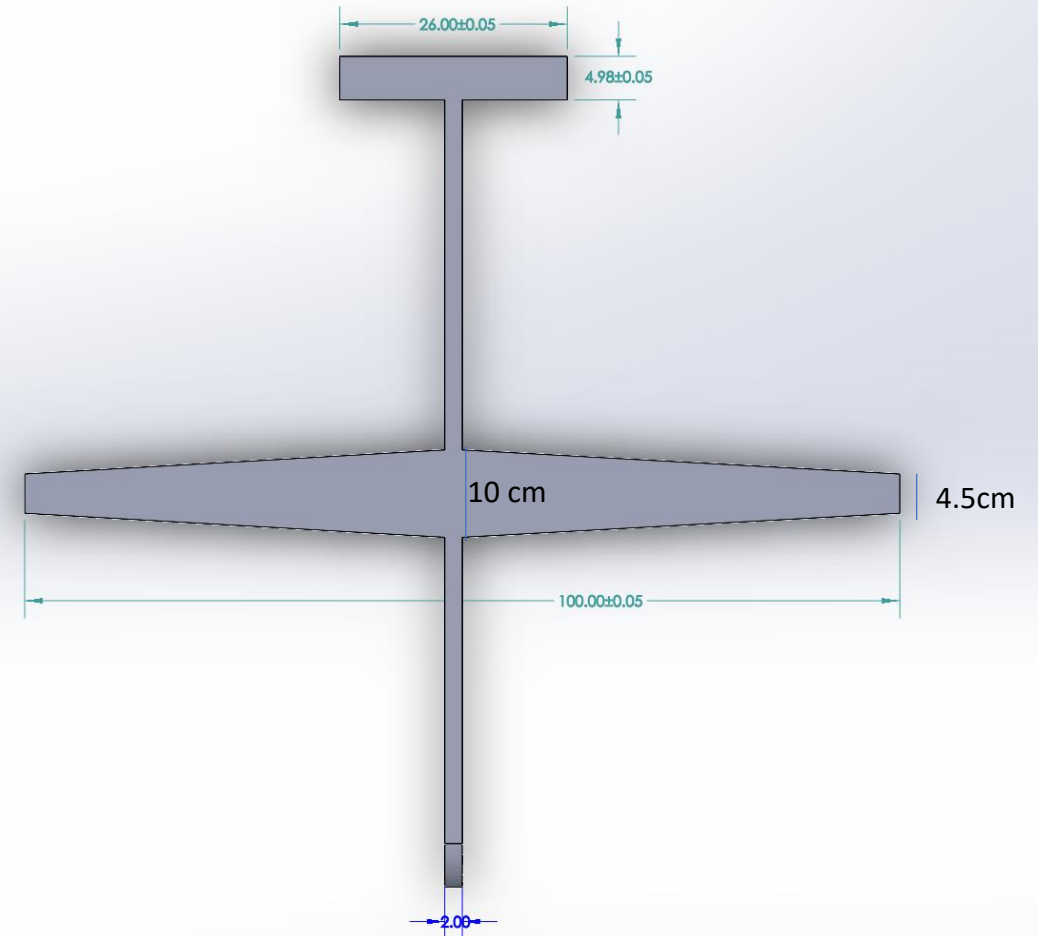
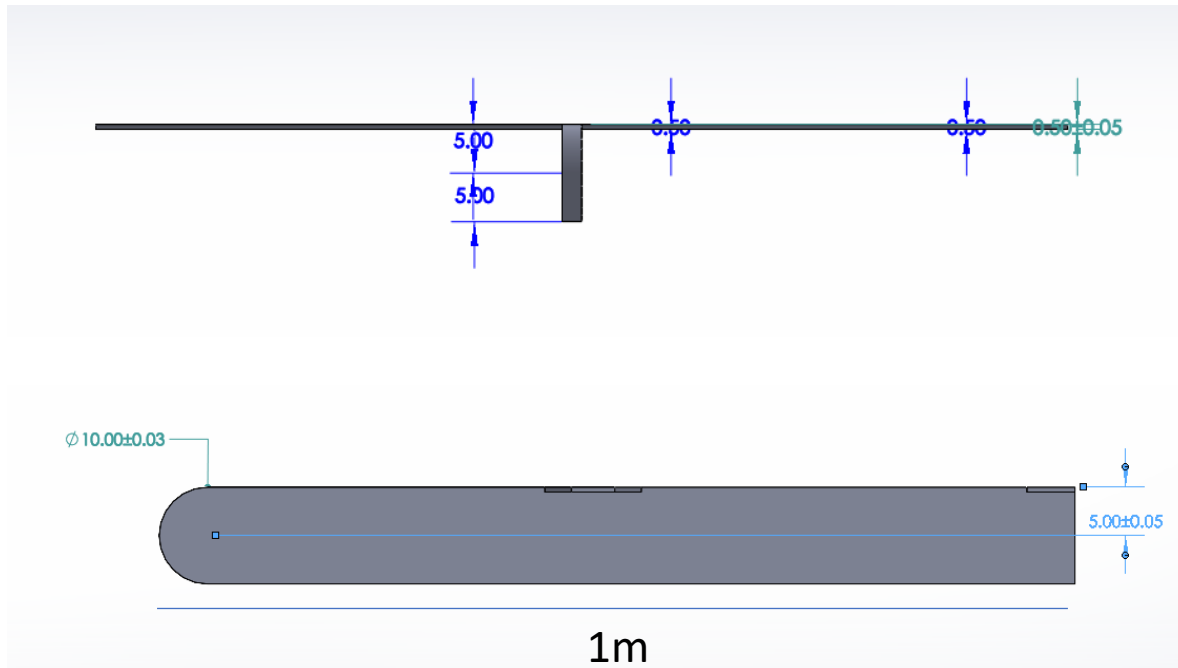


$$S_{ref} = .0725 \text{ m}^2$$

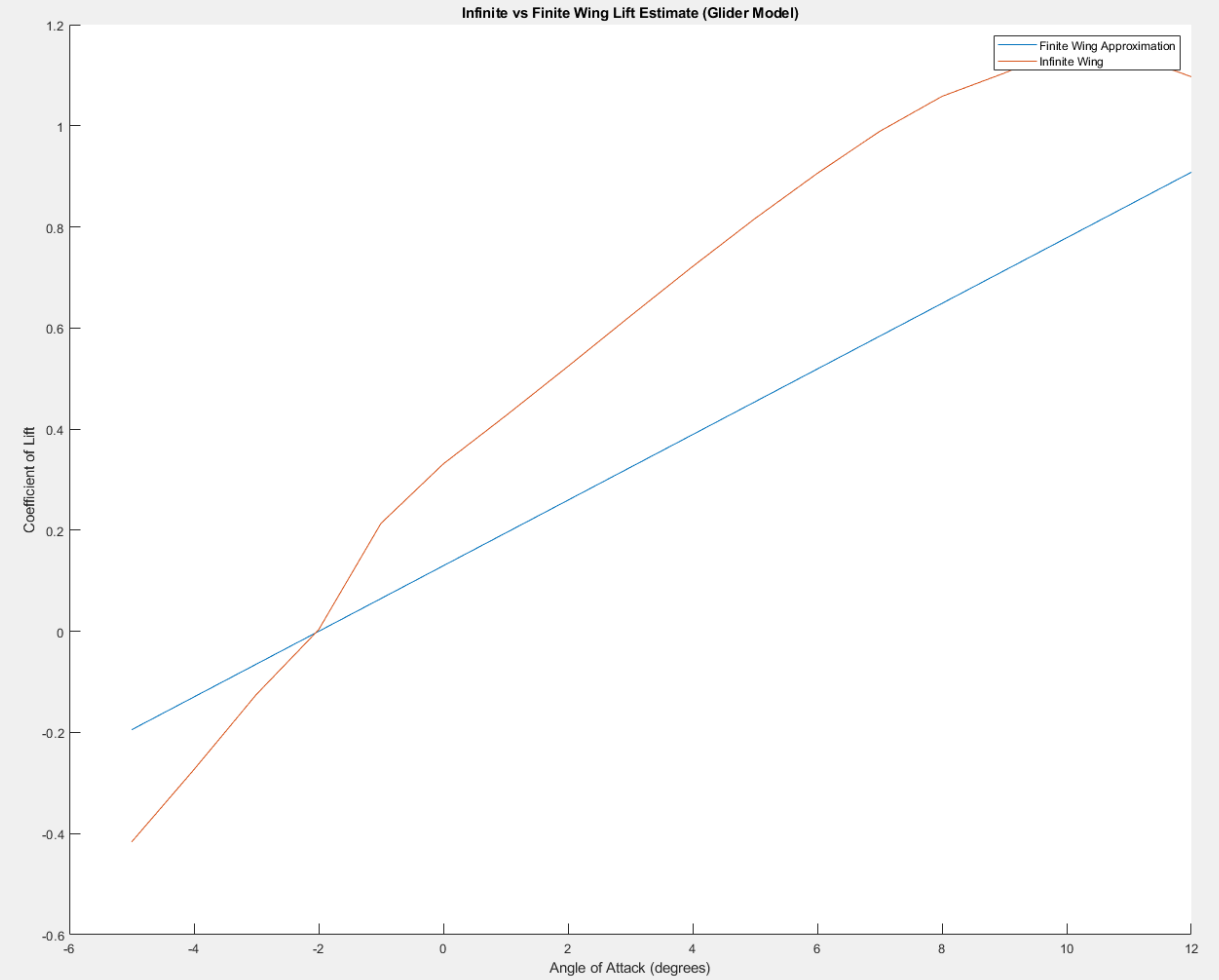
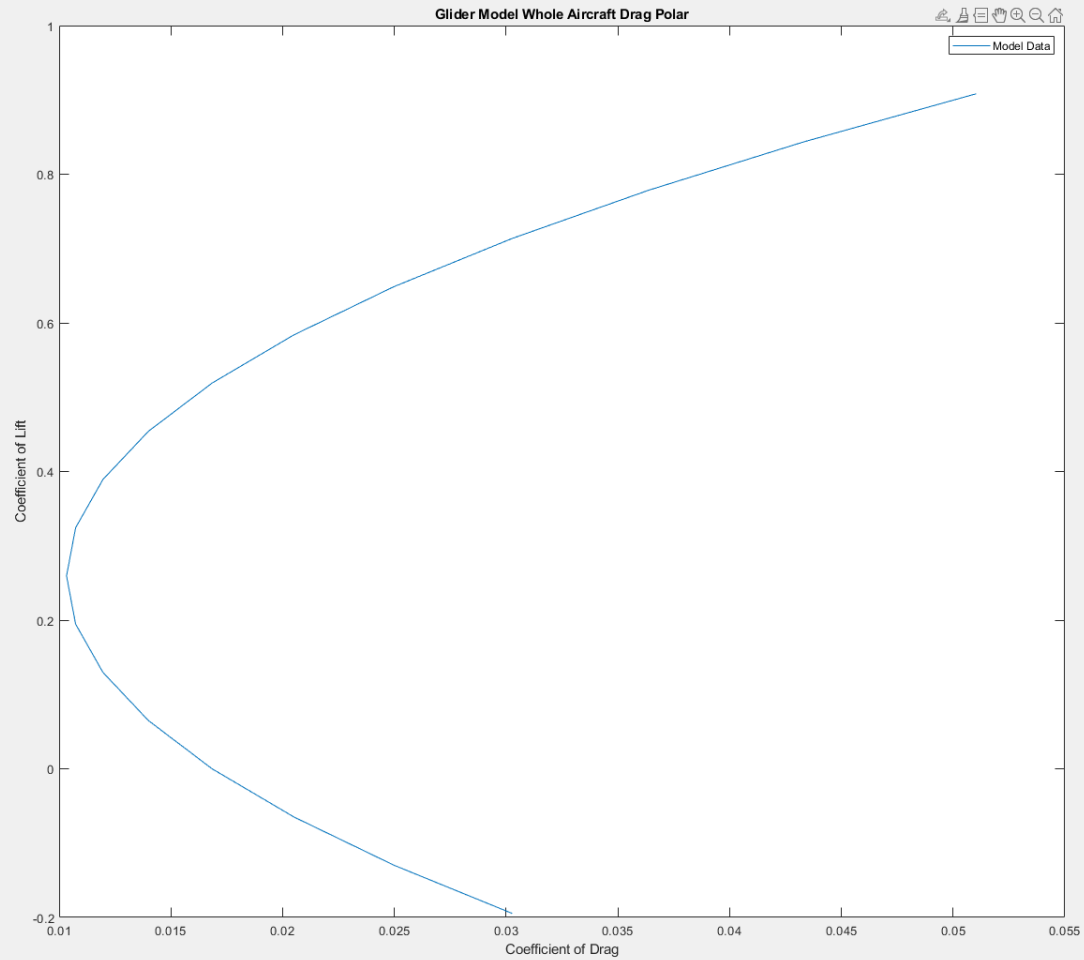
$$S_{wet} = .407 \text{ m}^2$$

$$\text{Weight} = 115 \text{ g}$$

$$AR = 3.45$$



Aircraft Estimated Lift Curve and Whole Aircraft Drag Polar Analysis



Aircraft Performance Initial Estimates vs Requirements



Table 1. Summary of Glider Prototype Requirements
(7 m launch height, 1.5 km Standard Atmosphere)

System Requirements	Threshold	Objective	Min or Max	MY DESIGN
Max Glide Range (meters)	70 m	100 m	Max	74 m
Max Glide Range Velocity (meters/second)	12 m/s	7 m/s	Min	2.4 m/s
Max Glide Endurance (seconds)	7 sec	10 sec	Max	39 sec
Maximum Wingspan (meters)	1.0 m	N/A	Max	1.0 m
Unit Cost (Fake dollars) using the formula: Empty Weight (in grams) * \$1 = Cost	No “limit”, but will be used as a discriminator between designs.		Min	\$115