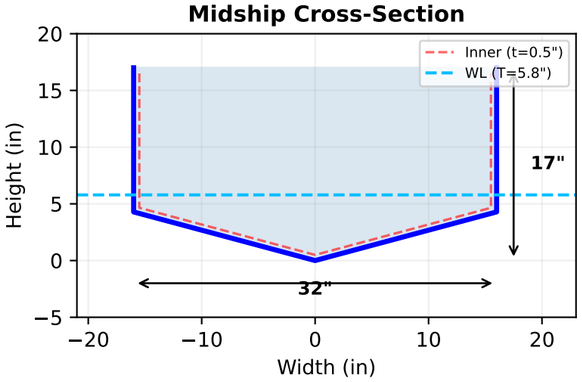
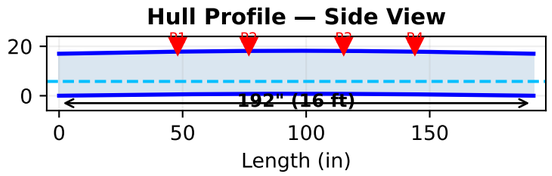
NAU Concrete Canoe 2026 — Visual Calculator Dashboard

192" × 32" × 17" | 225 lbs | FB=11.2" | GM=7.1" | SF=22.5

Midship Cross-Section



Hull Profile — Side View



Design Parameters

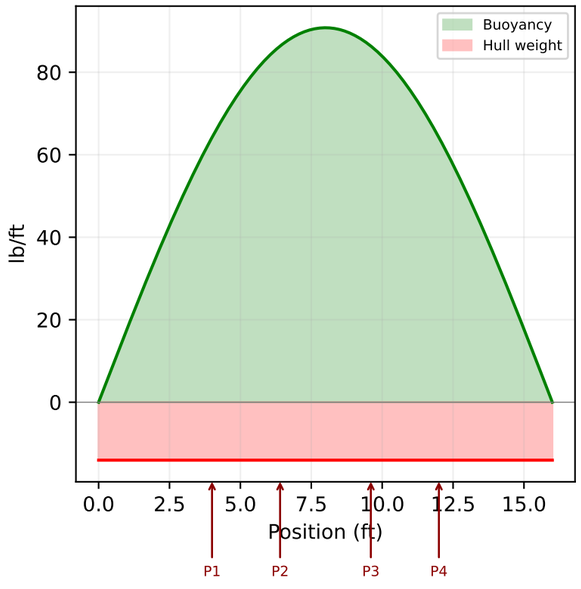
Length	192" (16 ft)
Beam	32"
Depth	17"
Thickness	0.5"
Concrete density	60 PCF
Flexural strength	1500 PSI
Hull weight	224.8 lbs
Crew weight	700 lbs
Total loaded	924.8 lbs
Draft	5.79"
Freeboard	11.21"

ASCE Requirements Check

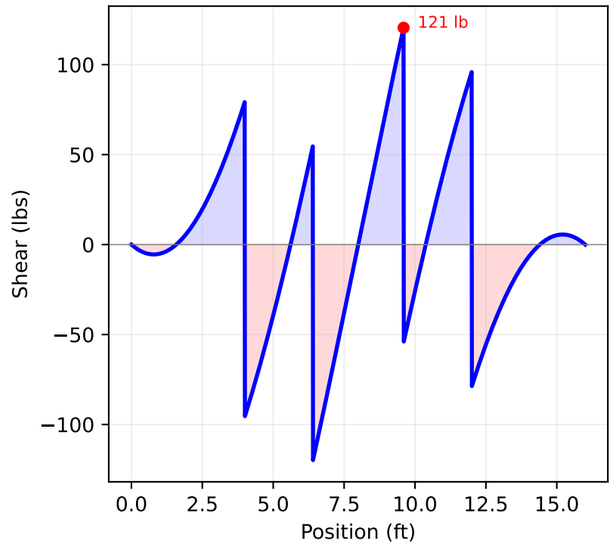
Requirement	Limit	Actual	Status
Freeboard	≥ 6.00"	**11.21"**	✓
Metacentric Height	≥ 6.00"	**7.06"**	✓
Safety Factor	≥ 2.0	**22.5**	✓
Cement/cementitious	≤ 0.40	**0.35**	✓
Portland + lime	≤ 40%	**35%**	✓
Lime content	≤ 5%	**3%**	✓
Reinforcement POA	≥ 40%	**42%**	✓

✓ ALL PASS

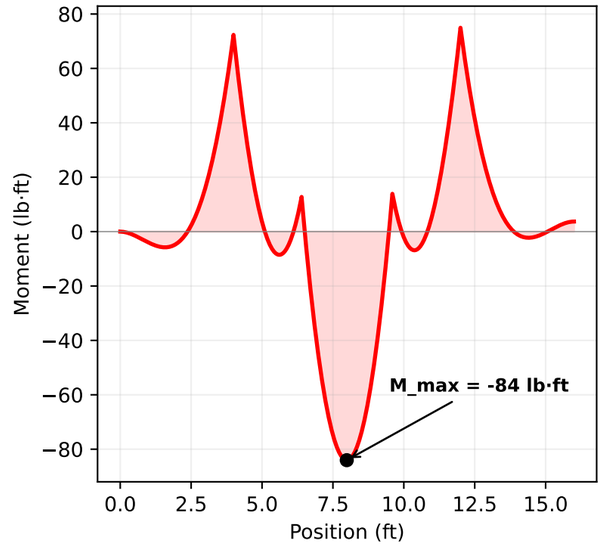
Load Distribution (Equilibrium)



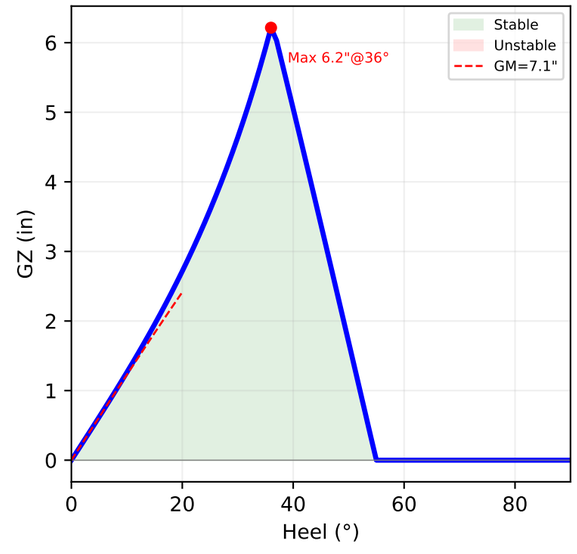
Shear Force Diagram



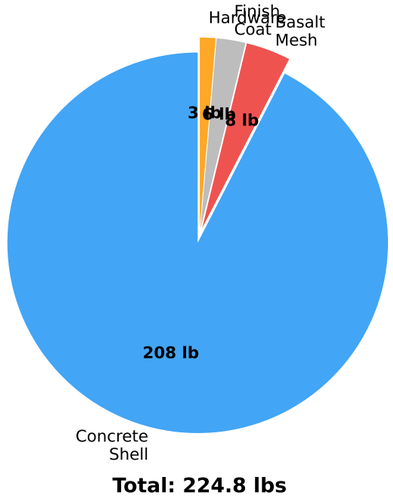
Bending Moment (Free-Floating)



Righting Arm (GZ) Curve



Weight Breakdown

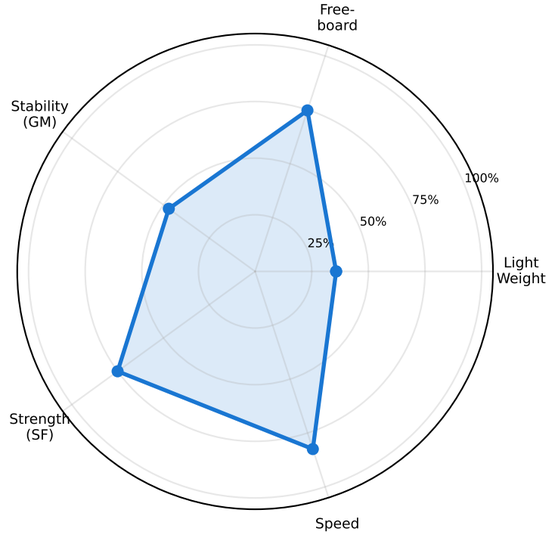


Total: 224.8 lbs

Material Quantities

Concrete volume (net)	**3.46 ft³**
+ 40% waste factor	**4.85 ft³**
Batches (5-gal)	**8**
Batch weight	**40.1 lbs**
Basalt mesh (2 layers)	**55 ft²**
Mesh POA	**42%**
CNC mold sections	**32**
Mold cost estimate	**$850**

Performance Profile



Project Summary

NAU CONCRETE CANOE 2026

Hull: 192" × 32" × 17"

Weight: 225 lbs (target 237)

STATUS: ALL ASCE REQS PASS ✓

Weight savings vs original: 51 lbs

Key: wider beam (32" vs 30")

→ fixed GM stability

NEXT STEPS:

1. Present to faculty advisor
2. Build SolidWorks model
3. CNC-cut mold sections
4. Order basalt mesh + materials
5. Schedule pour date

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