

2013 NAU ASCE Concrete Canoe

Night Fury



Naser Aljaberi

Jonathan Brusnahan

Elise Cheever

Kelli Rider

Sara Watts

Overview

- Introduction
- Project Management
- Analysis
- Technical Design
- Construction
- Conclusion



Introduction

- Our team
- History of NAU in PSWC
- Theme



Project Management



Project Manager/
Reinforcement Lead:
Sara Watts



Concrete Design
Lead:
Naser Aljaberi



Structural Design
Lead:
Kelli Rider



Hull Design Lead:
Jonathan Brusnahan



Documentation Lead:
Elise Cheever

Project Management

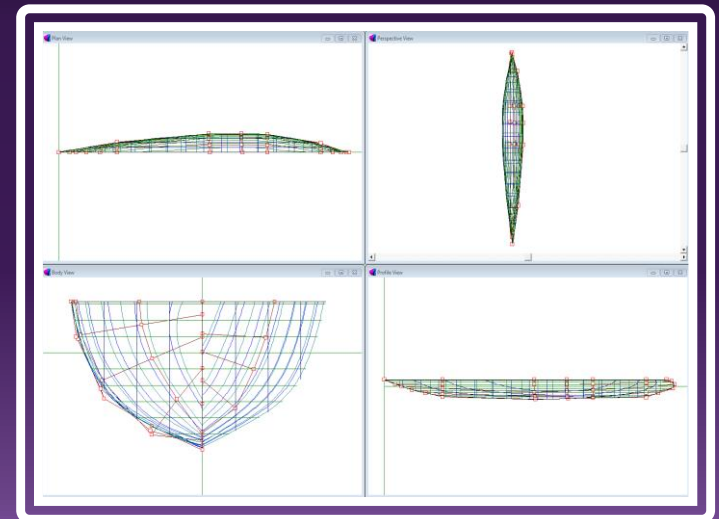
- Team Meetings
- Documentation
 - Meeting Minutes
 - Expenses
 - Materials
- Scheduling
- Allocation of man hours and resources

Project Summary	
Total Cost of Construction	\$1450
Man Hours Spent	1875
Major Milestones	
Start of Mold Construction	12/1/2013
<i>Night Fury</i> Pour Date	2/1/2013
PSWRC	4/4/2013

Analysis

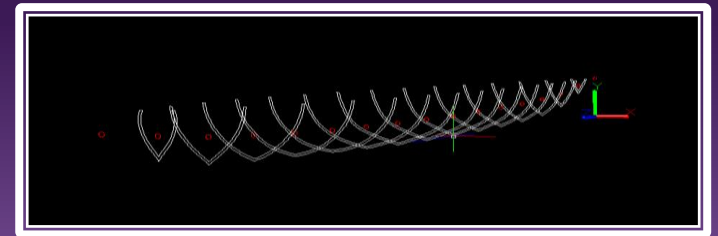
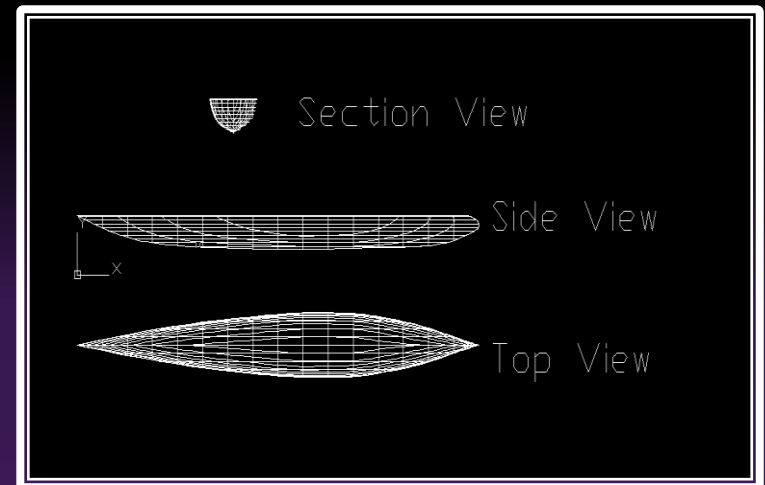
- Hull analysis using Prolines7
 - Water elevations for different load cases, freeboard = 4.4inches
- Structural Analysis
 - Hand Calculations
 - Finite Element Analysis using SAP2000 and RISA for beam model

Final Hull Design	
Wetted Surface Area (ft ²)	33.6
Beam width (ft)	2.28
Displacement- Length Ratio	53.8



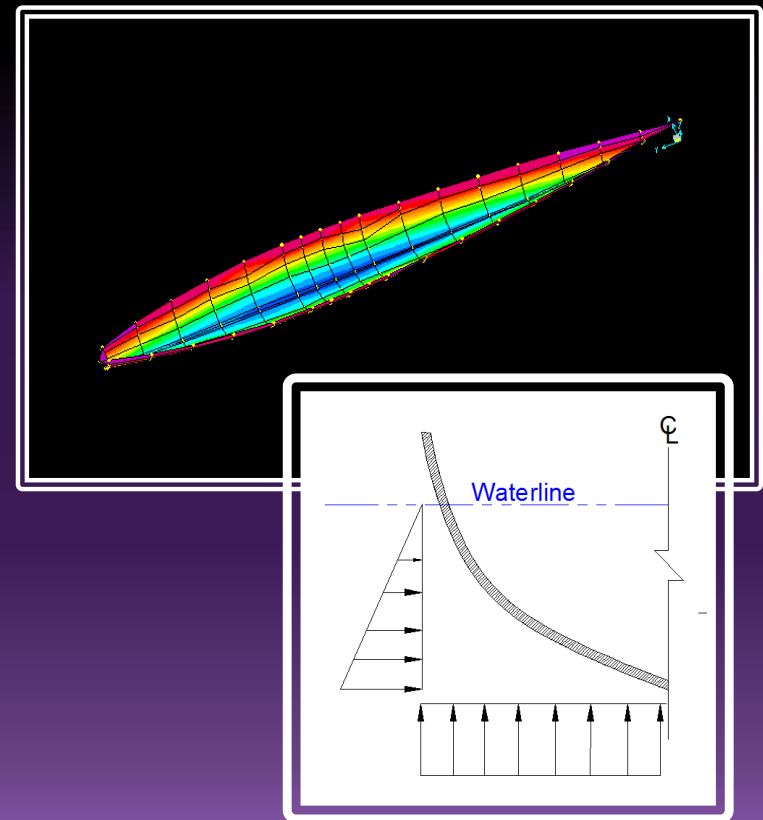
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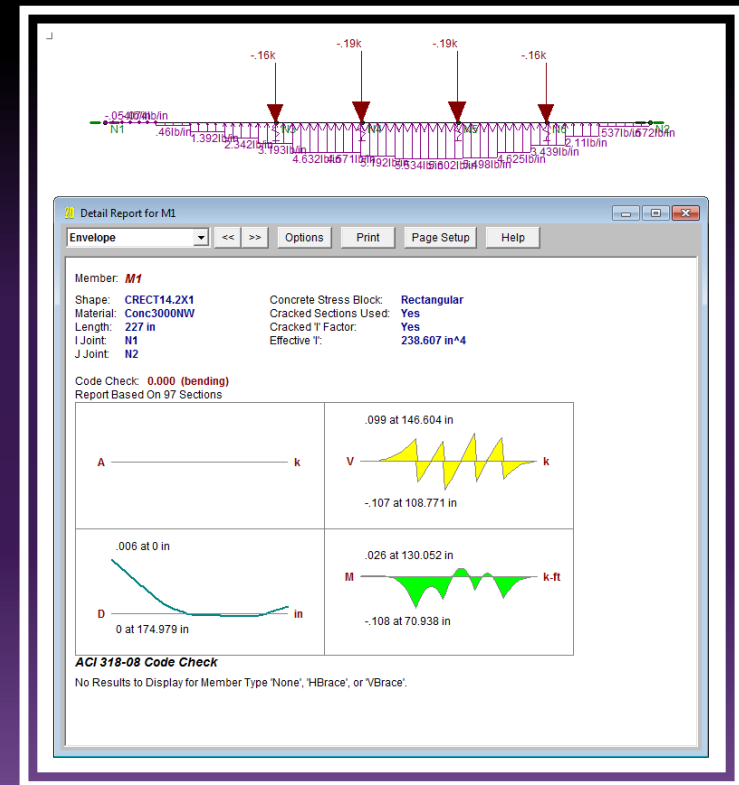
Analysis

- Hull analysis using Prolines7
 - Water elevations for different load cases, freeboard = 4.4inches
- Structural Analysis
 - Transvers Direction
 - Longitudinal Direction



Analysis

- Hull analysis using Prolines7
 - Water elevations for different load cases, freeboard = 4.4inches
- Structural Analysis
 - Transverse Direction
 - Longitudinal Direction



Technical Design

- Concrete mix design
 - Focuses: strength and weight
 - Testing of mixes: compression, split cylinder
- Reinforcement design: based on ASD
 - Fiberglass mesh
 - Secondary for longitudinal and primary for transverse
 - Longitudinal post-tensioning
 - Addition of P/A, P is about 150 lbs
 - P_{xe} effect

Plastic Unit Weight	61.5 lbs/ft ³
Dry Unit Weight	52.7 lbs/ft ³
Compressive Strength	1,570 psi
Tensile Strength	237 psi



Construction

- Strongback
- Mold
- Concrete pour
- Curing
- Finishing



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Conclusion

- Produce quality product
- Set standard for future

canoe teams

- Process
- Organization
- Innovative design ideas



Questions

