

Final Design Details

NAU Concrete Canoe 2015-2016
Polaris

Canoe Parameters

- Max Length: 21 *ft* (252 *in*)
- Max Width: 2-3 *ft-in* (27 *in*)
- Max Depth: 1-2 *ft-in* (13.5 *in*)
- Overall Thickness: .5 *in*
- Overall Weight: 175 *lbs*

Structural Capacities

- Limiting Transverse Compressional Stress: 1715.9 *psi*
- Limiting Transverse Tensile Stress: 1715.9 *psi*
- Limiting Longitudinal Compressional Stress: 917.5 *psi*
- Limiting Longitudinal Tensile Stress: 1319.5 *psi*

Concrete Characteristics

- 28-Day Compressive Strength: 1950 *psi*
- 28-Day Tensile Strength: 190 *psi*
- Plastic Unit Weight: 66.1 *pcf*
- Oven-Dry Unit Weight: 59 *pcf*

Concrete Mix Percentages

- Flyash: 21.2 %
- BASF MasterAir AE 90: 3.5 %
- EkkoMAXX: 1.6 %
- BASF MasterColor: 5 %
- Poraver: 36 %
- 3M Glass Bubbles: 23.7 %
- Water: 9 %

Post-Tensioning

- Applied Tension: 85 *lbs*
- Percentage of Loss: 30 %
- Total Tension after Losses: 59.5 *lbs*
- Type of Tendon: 1/16" Galvanized Steel
- Type of Tubing: 1/8" Nylon
- Number of Tendons: 6

Bulkheads

- Length of Bow Bulkhead: 35 *in*
- Length of Stern Bulkhead: 29 *in*
- Type of Material: Styrofoam

Reinforcement Mesh

- Tensile Strength: 756 *lbs*
- Percent Open Area: 62.6 %
- Type of Material: SpiderLath Fiberglass