

Northern Arizona University



Rendering Document

The Collegiate Wind Competition

Sponsored by the Department of Energy

Submitted towards partial fulfillment of the requirements for

The Design Review Subcontest

NORTHERN
ARIZONA
UNIVERSITY



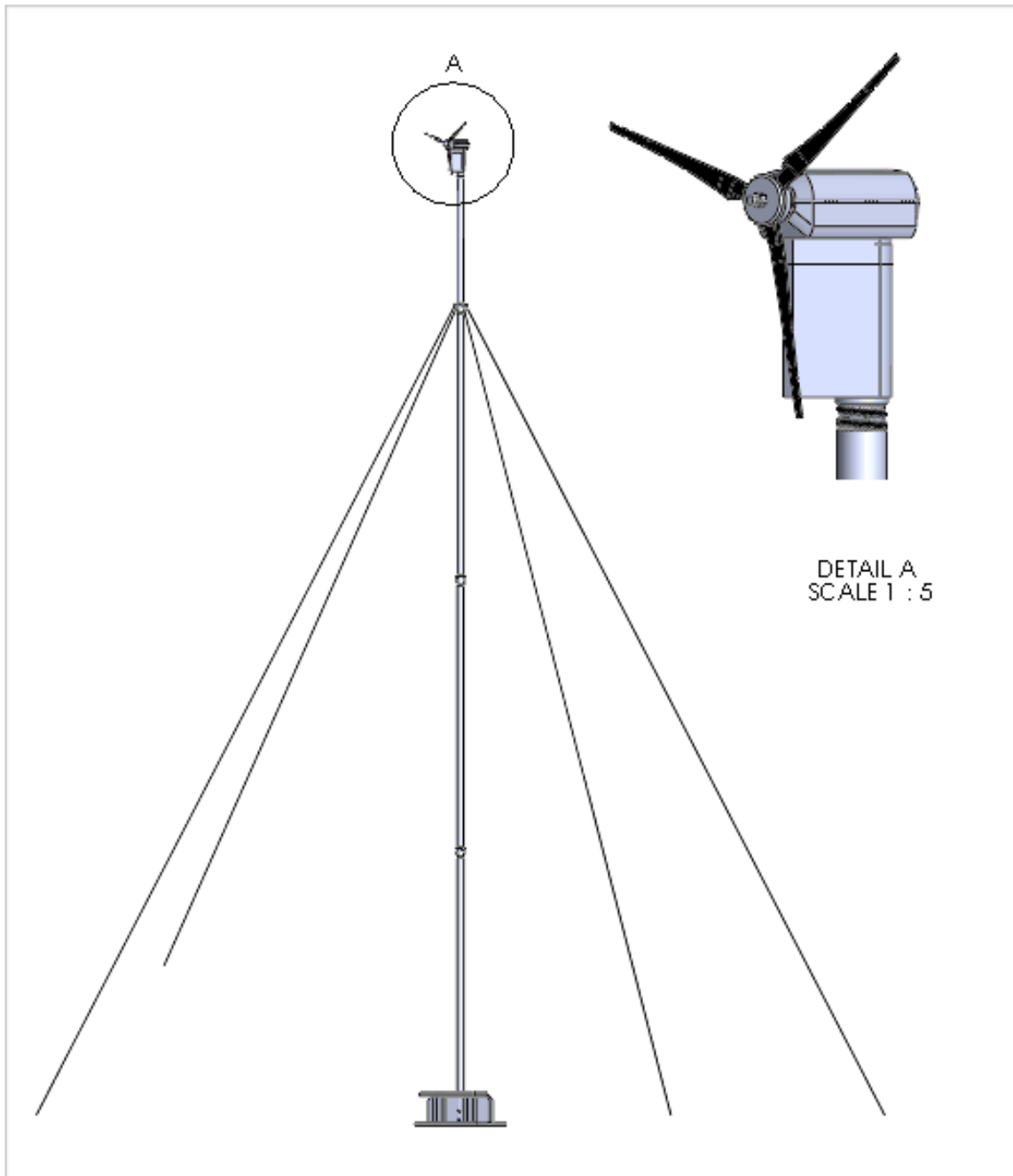
FLAGSTAFF

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Section 1: Engineering Drawings

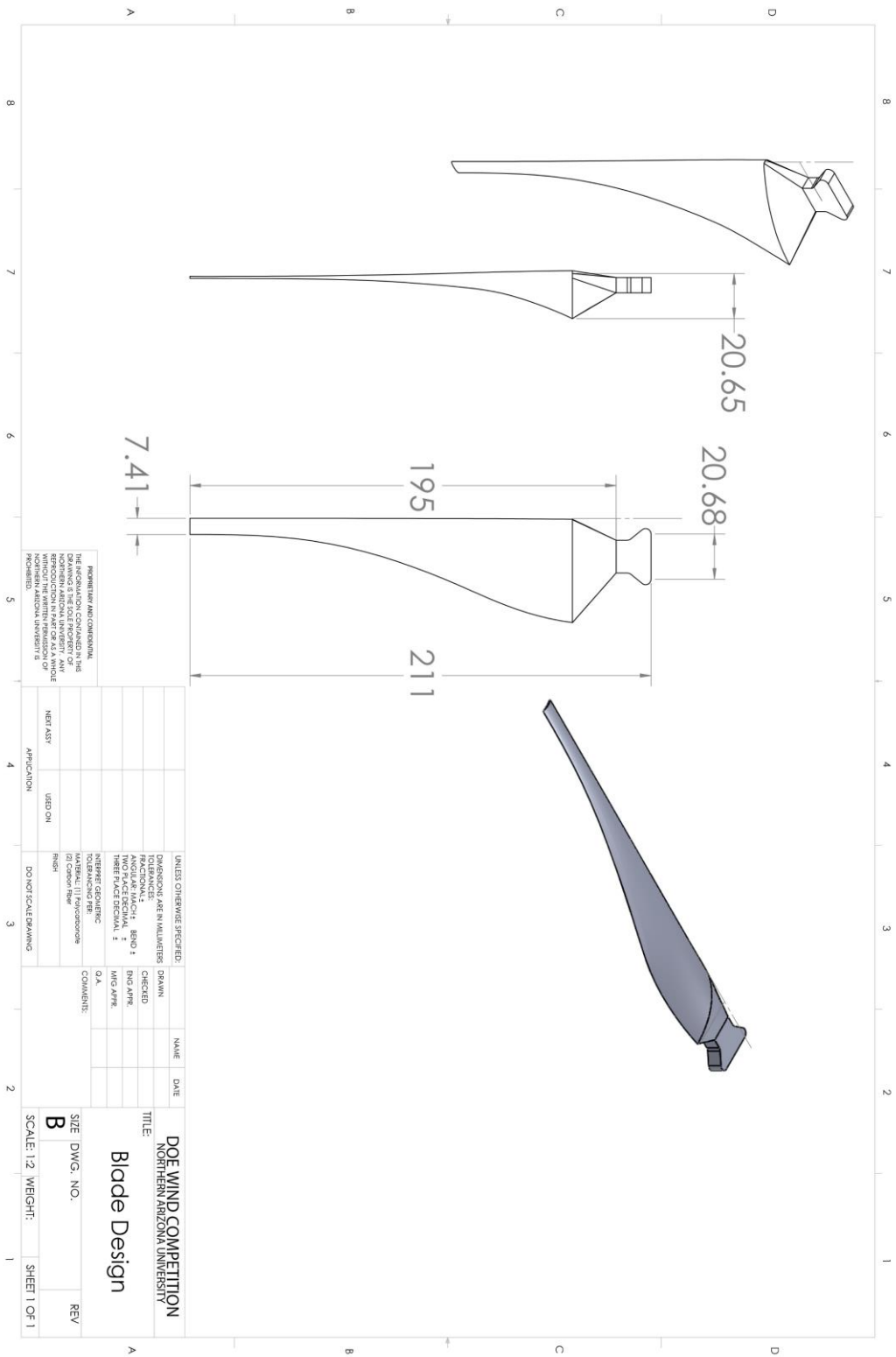
Turbine Assembly



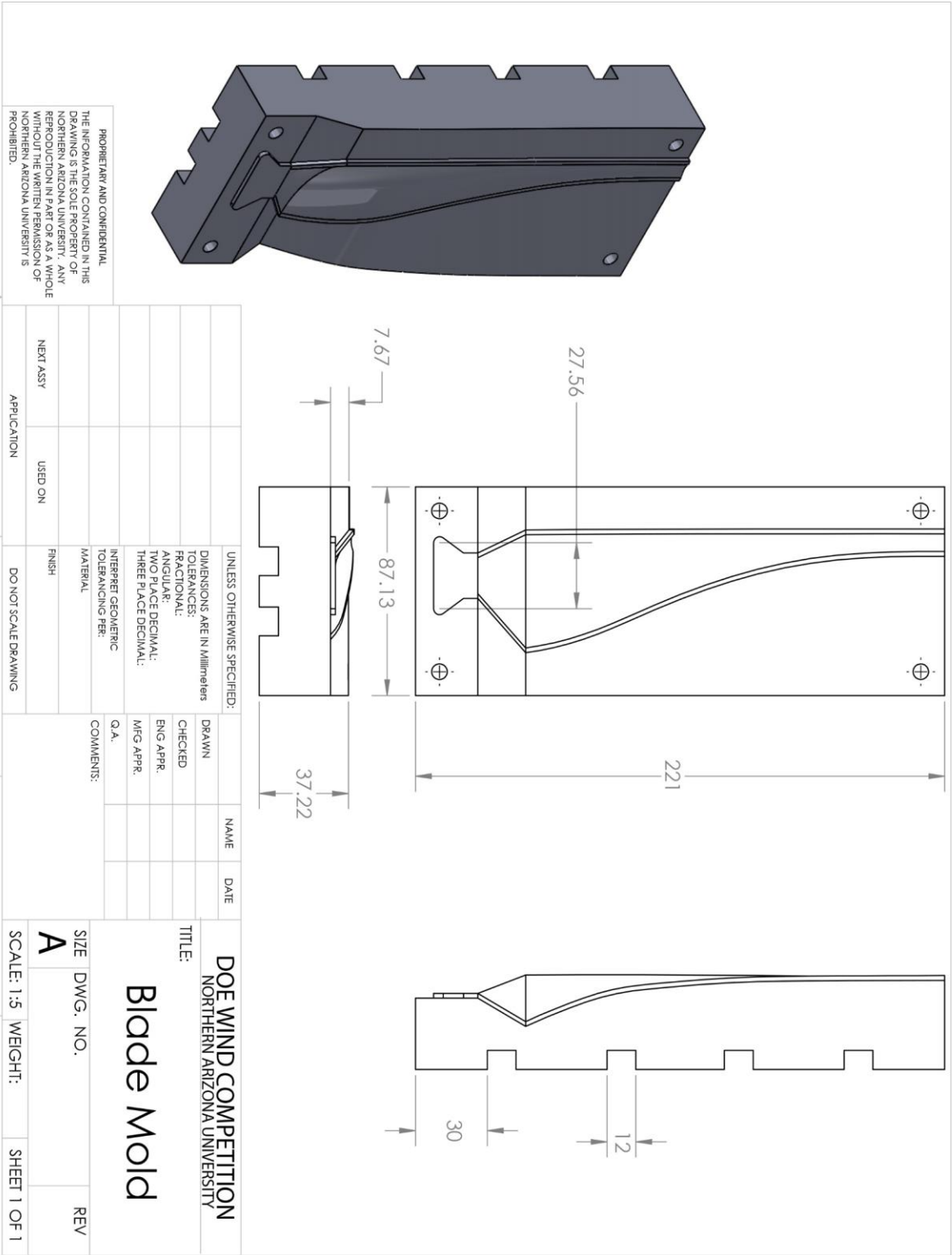
DETAIL A
SCALE 1 : 5

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	PART ASSY USED ON	NAME DO NOT SCALE DRAWING	D.A. EDU UNIT		Turbine Assembly
	APPROVAL				DR. D-NO. NO. A
					DRAWN BY: [] CHECKED BY: []

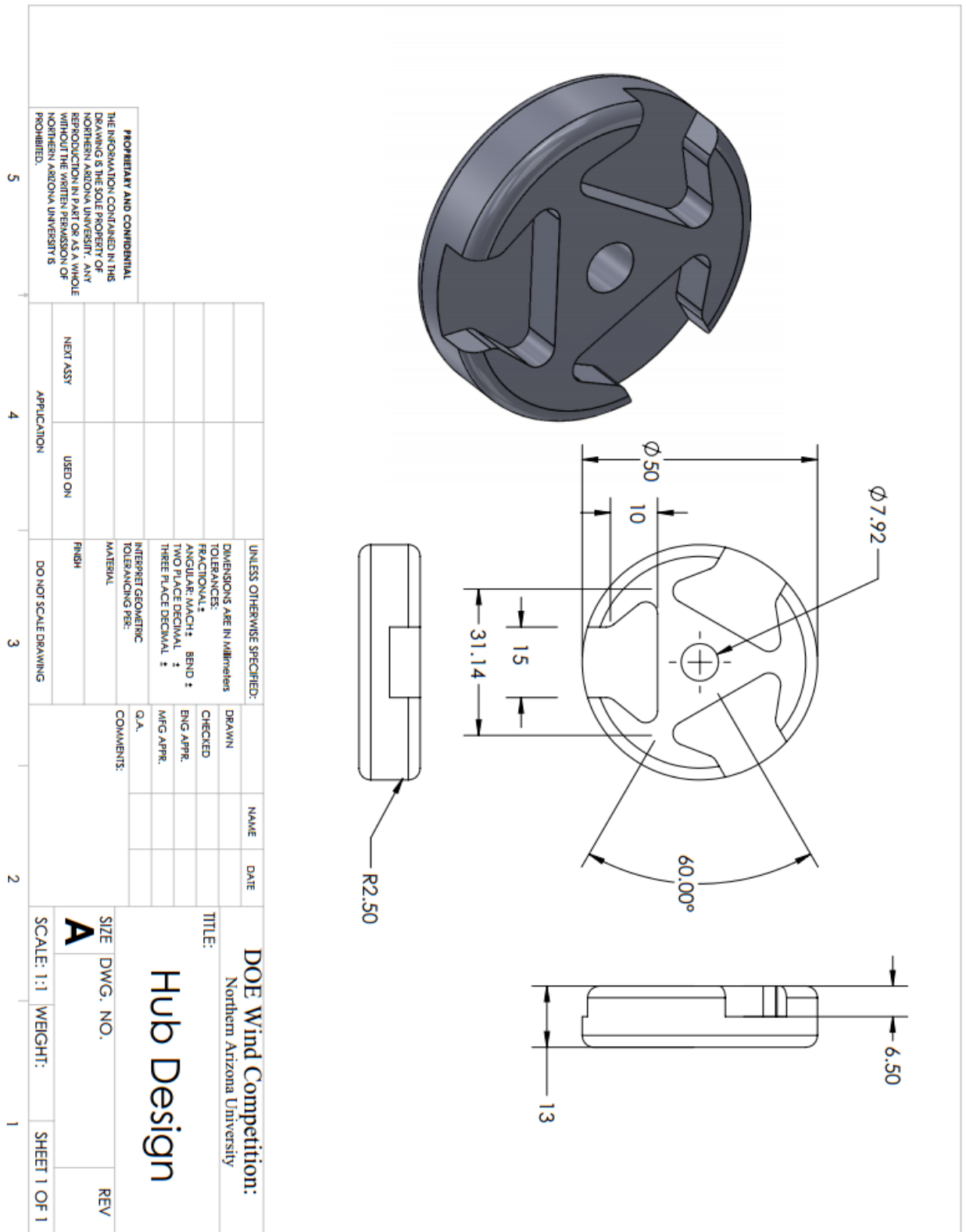
Blade Drawing:



Mold Design Drawing:



Hub Design Drawing:



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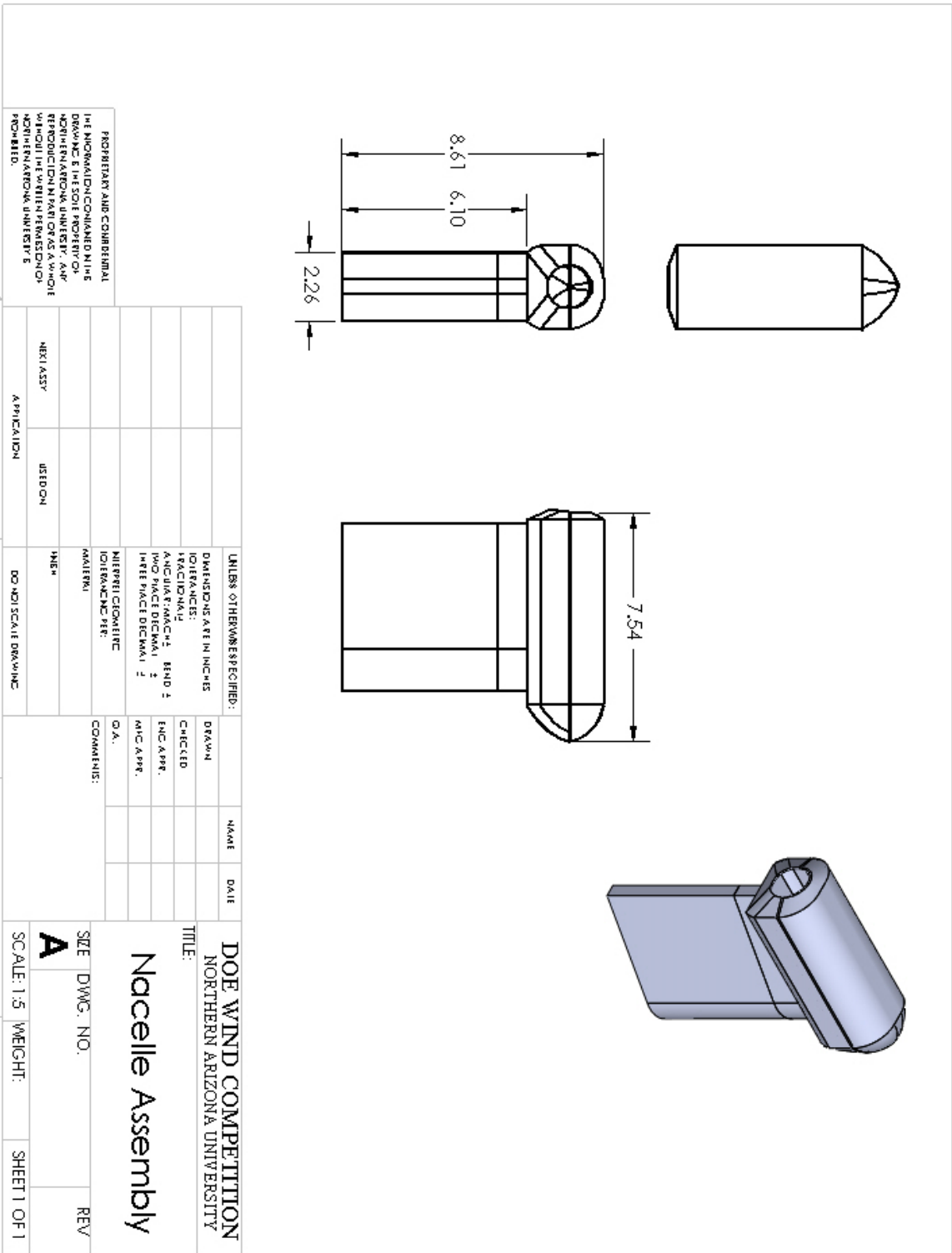
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN millimeters		DRAWN	NAME	DATE	DOE Wind Competition: Northern Arizona University Hub Design
TOLERANCES: FRACTIONAL: ±		CHECKED			
ANGULAR: MACH: ± BRND ±		ENG APPR.			
TWO PLACE DECIMAL: ±		MFG APPR.			
THREE PLACE DECIMAL: ±		Q.A.			
INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		COMMENTS:			
NEXT ASSY		USED ON	FINISH	DO NOT SCALE DRAWING	
APPLICATION					

5 4 3 2 1

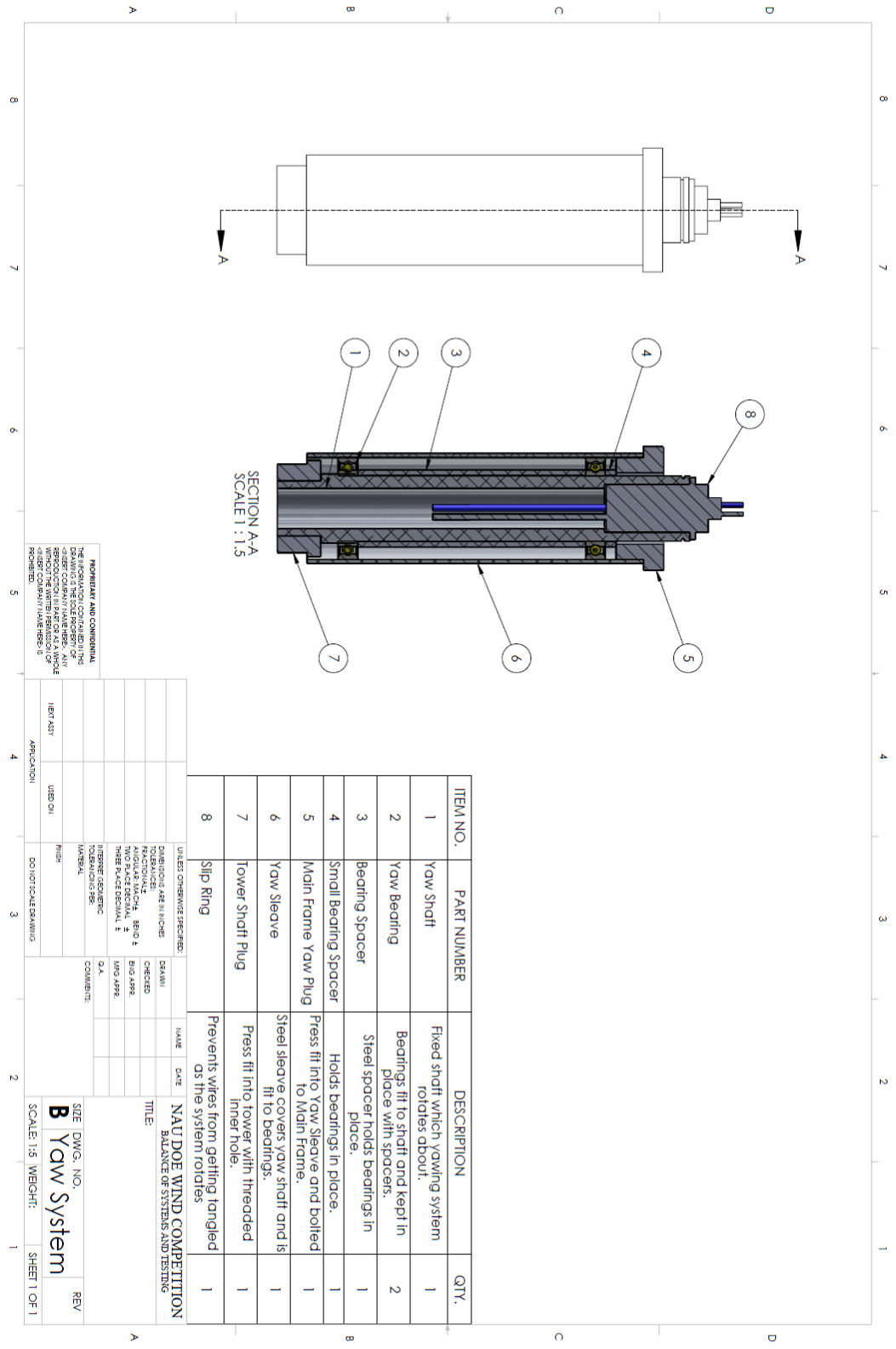
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SIZE DWG. NO. REV

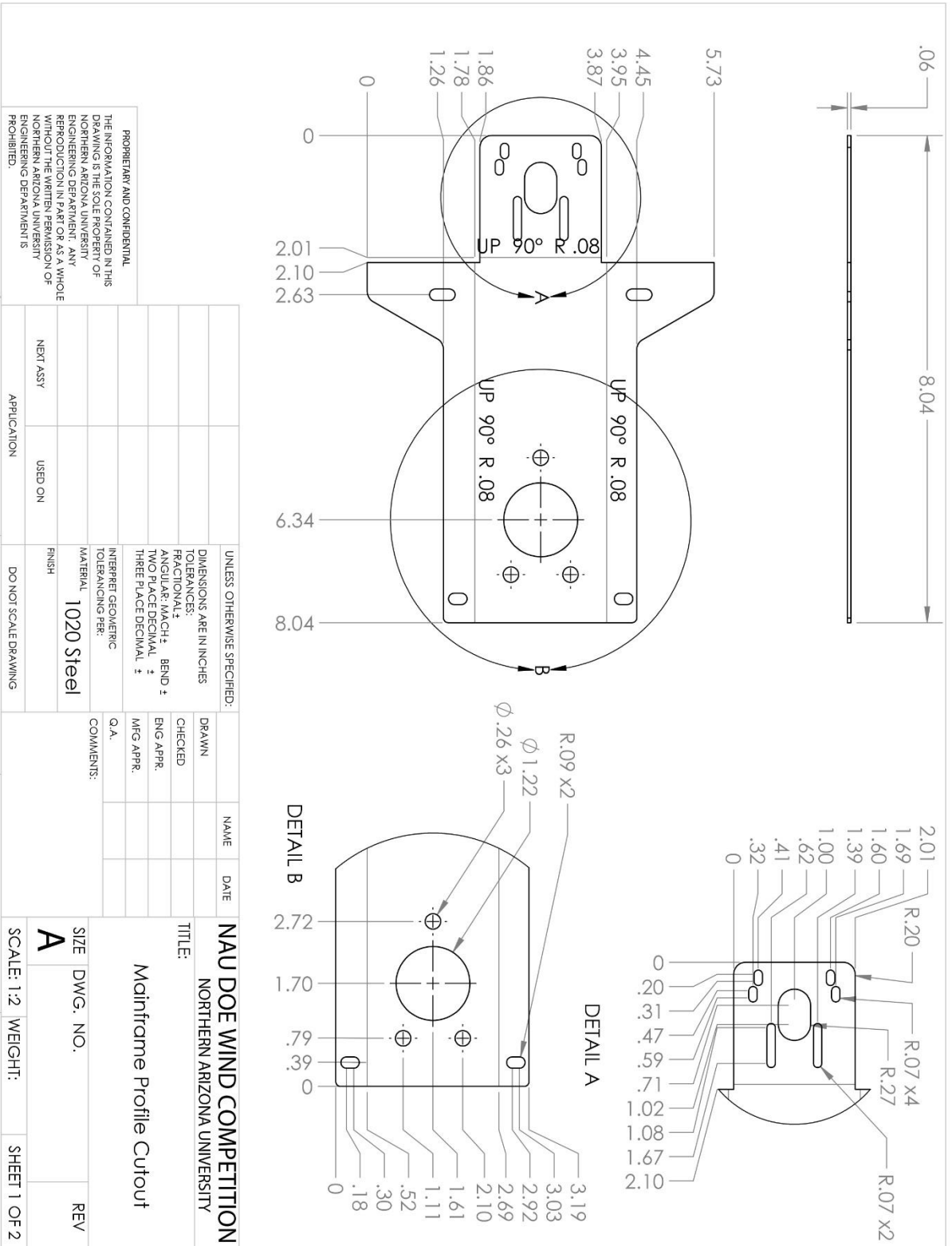
Nacelle Assembly Drawing:



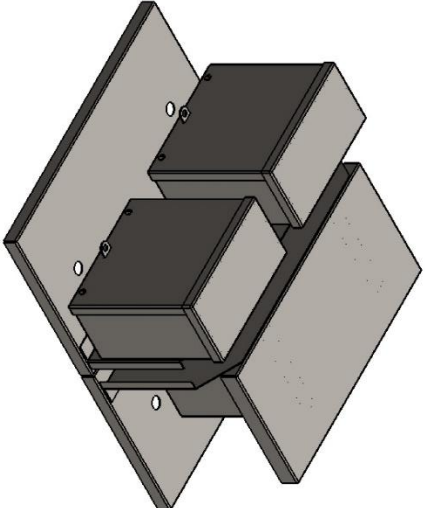
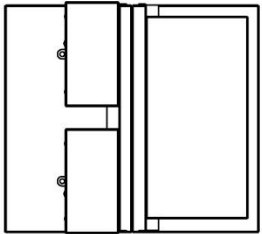
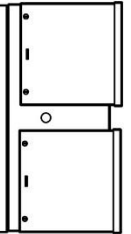
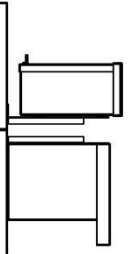
Yawing System Sectional View Drawing:



Mainframe Drawing:



Base Assembly Drawing:

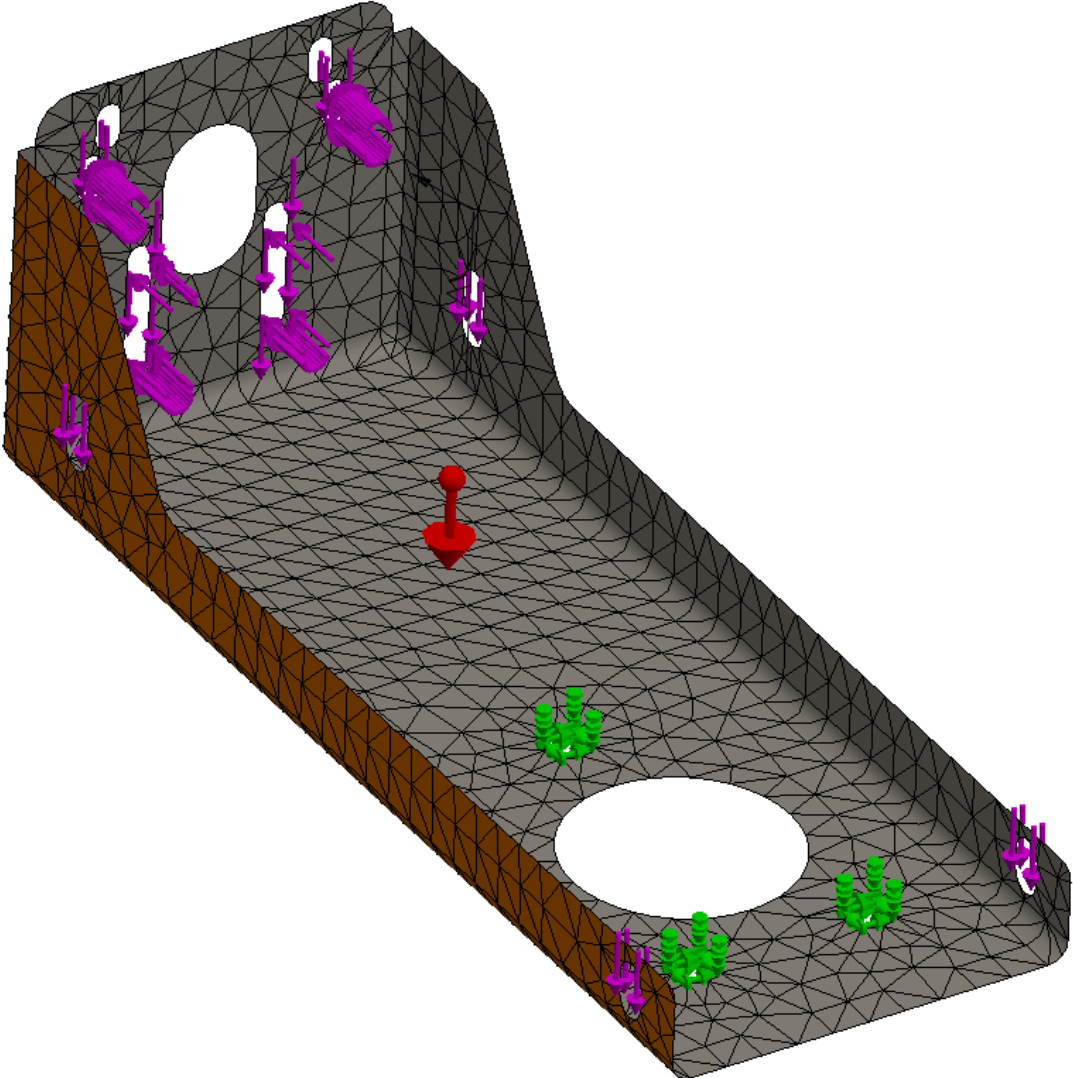





UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL: ± THREE PLACE DECIMAL: ± INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL FINISH		DRAWN	NAME	DATE	DOE WIND COMPETITION NORTHERN ARIZONA UNIVERSITY TITLE: Base Assembly w/ Electrical Enclosure SIZE DWG. NO. REV A	
DO NOT SCALE DRAWING	USED ON	CHECKED			SCALE: 1:12 WEIGHT:	SHEET 1 OF 1
APPLICATION	NEXT ASSY	MFG APPR.				
		Q. A.				
		COMMENTS:				

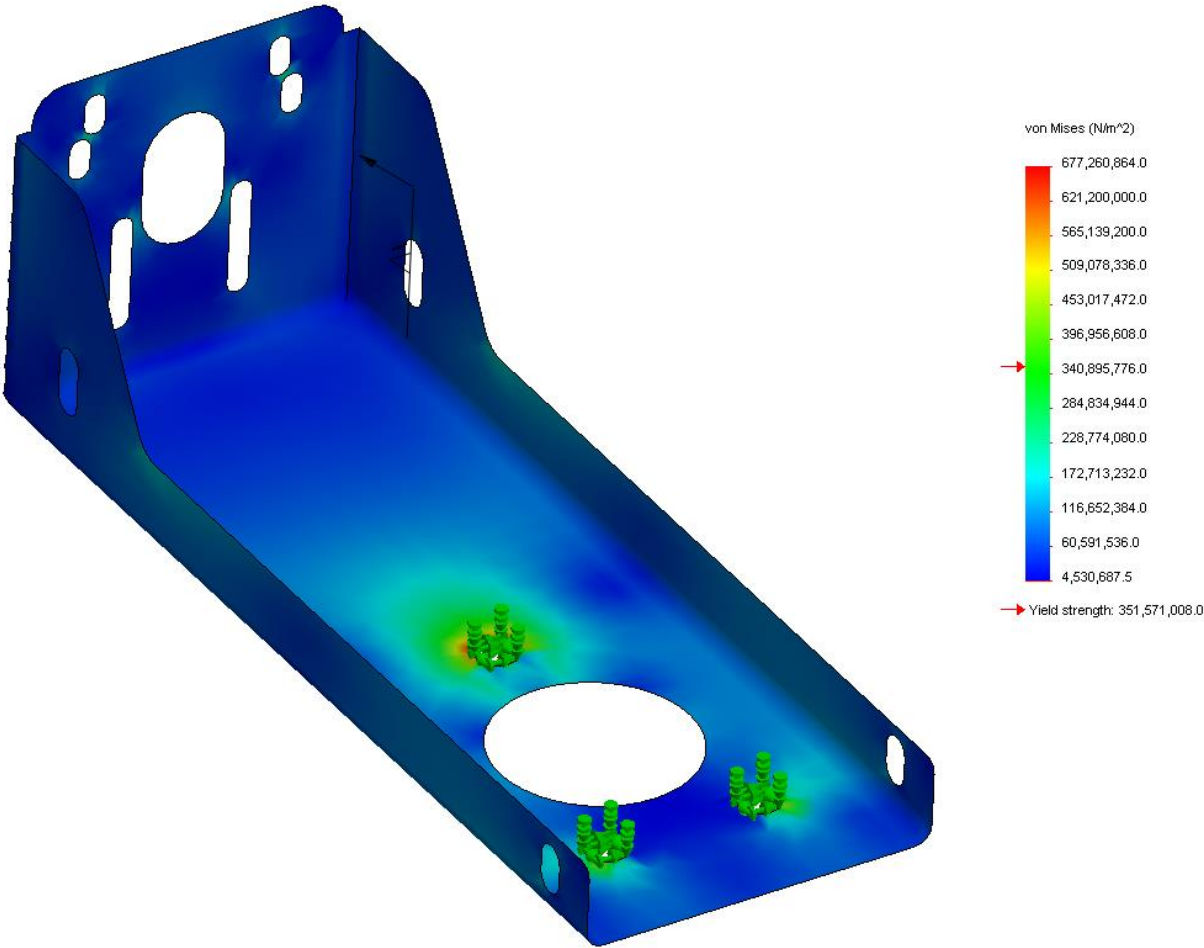
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Section 2: FEA Analysis

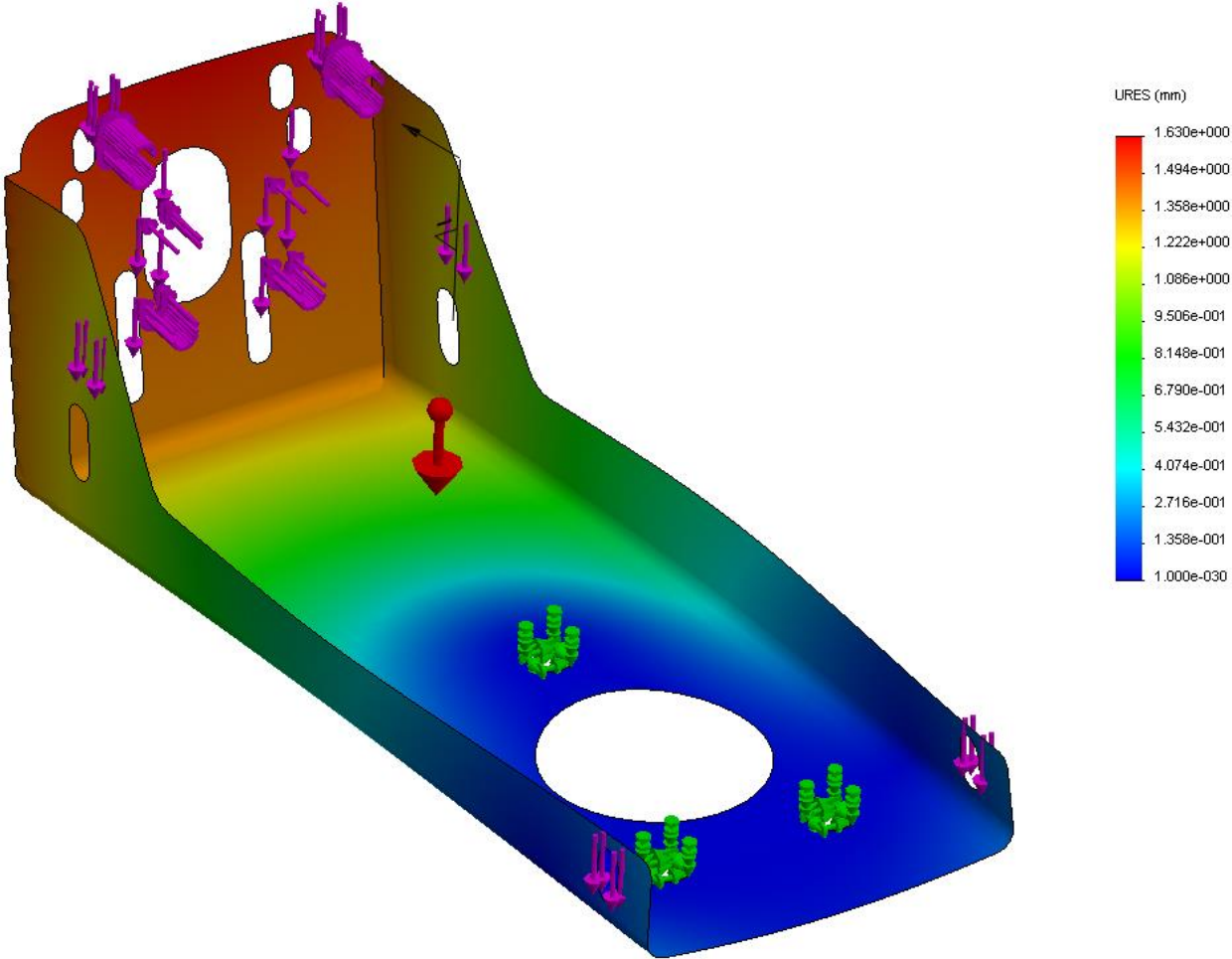
Mesh used for Mainframe Analysis:



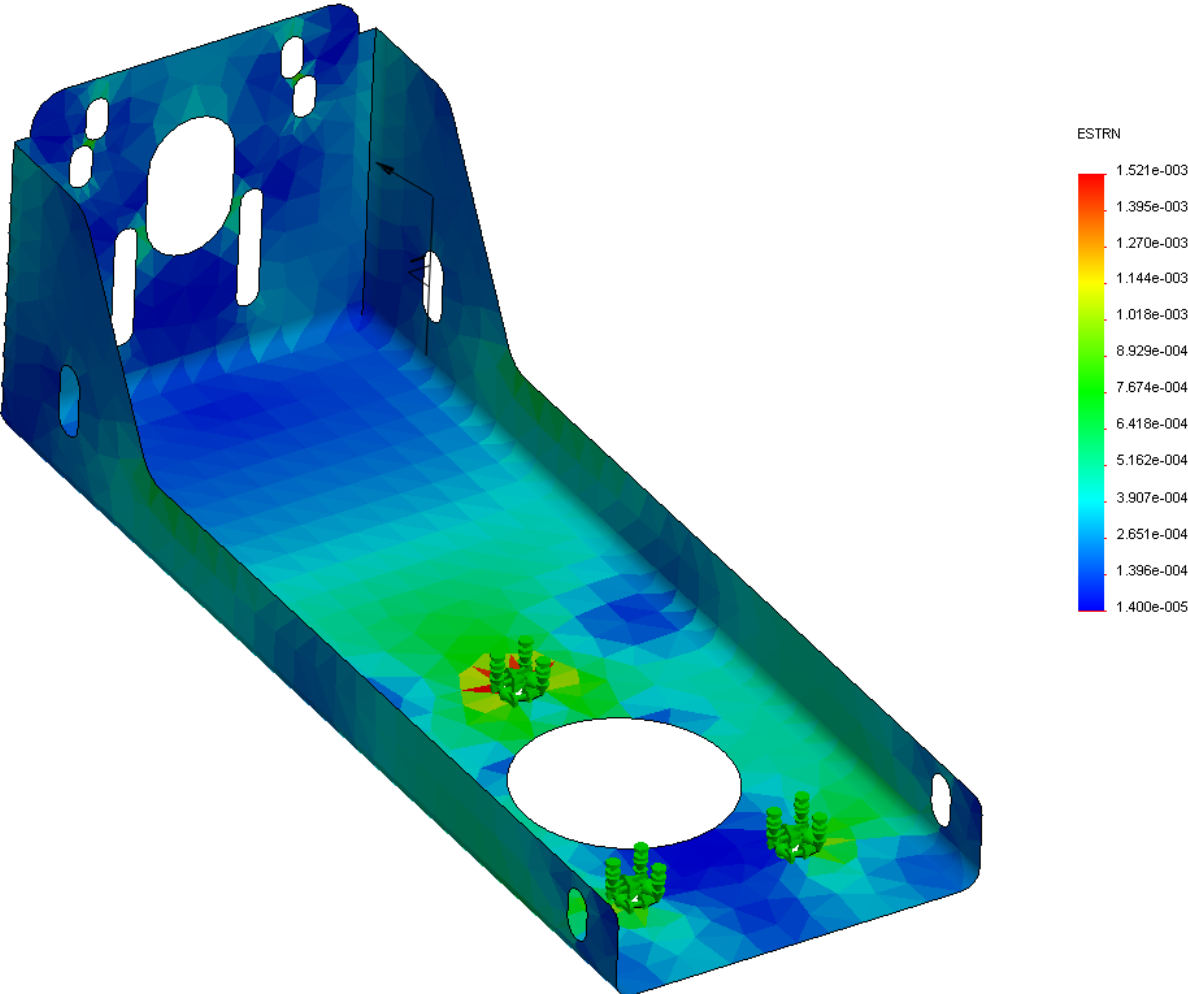
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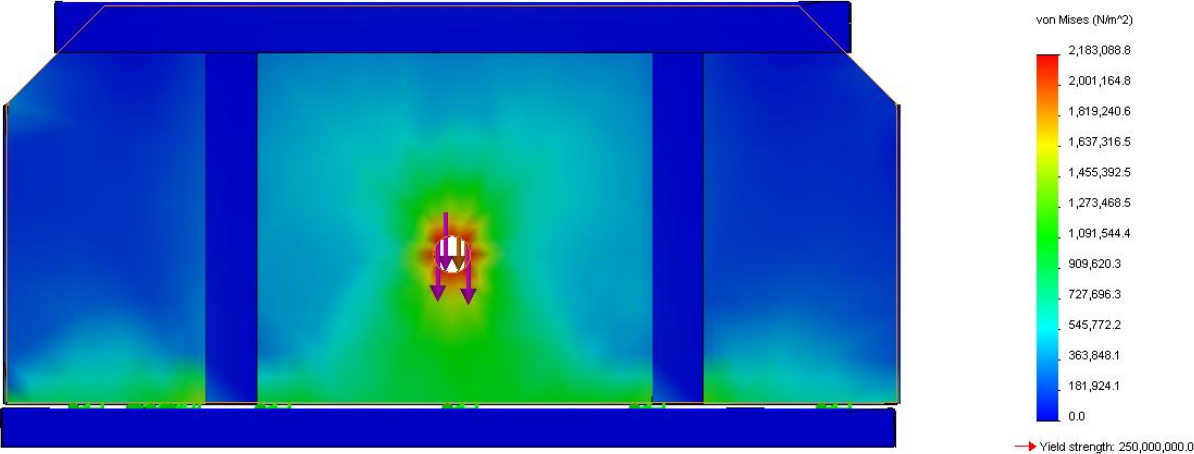
Mainframe Deflection Analysis:



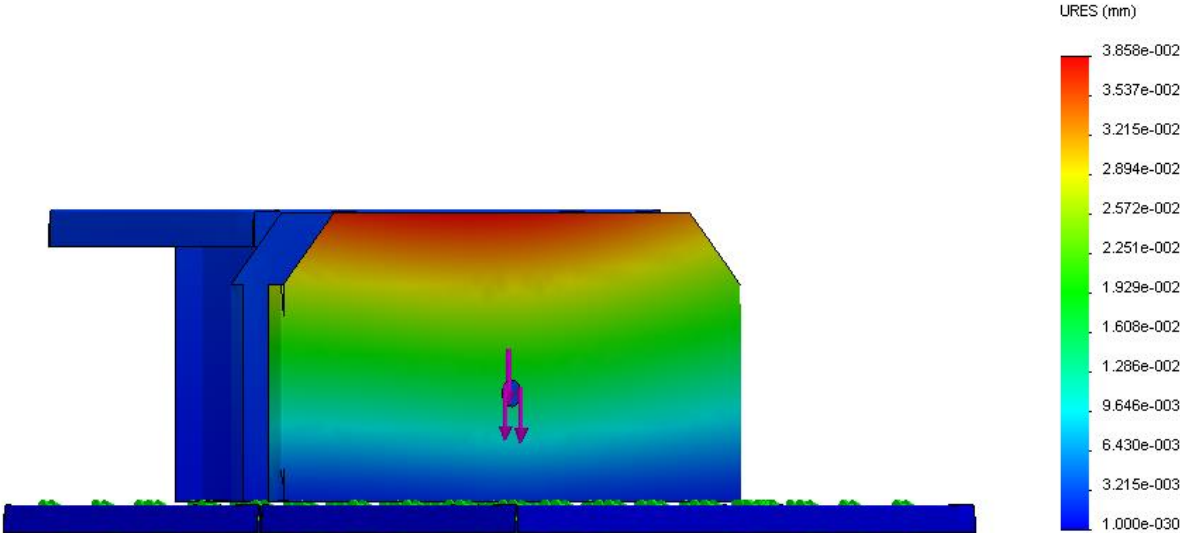
Mainframe Material Strain Analysis:



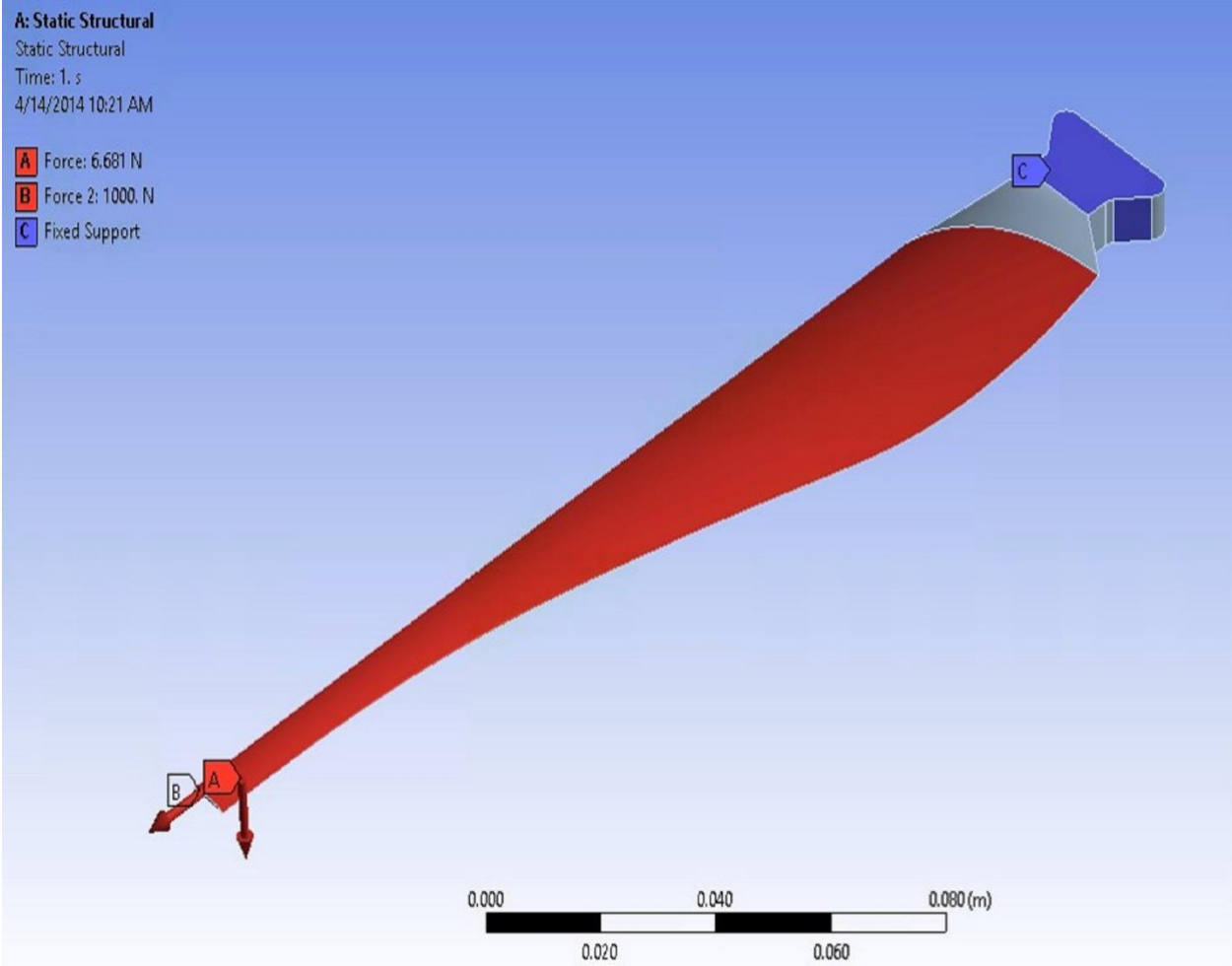
Base Von-Mises Stress Analysis:



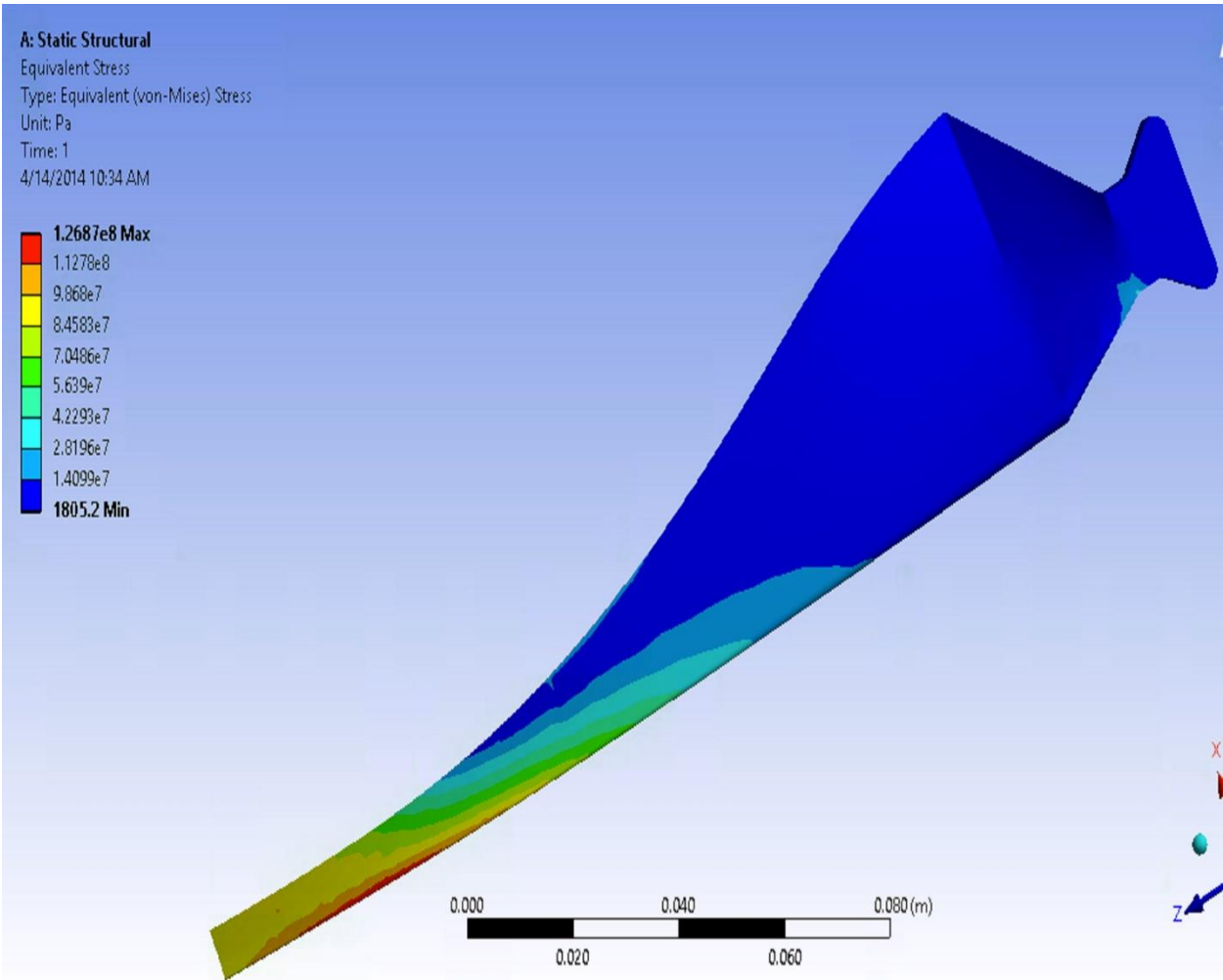
Base Deflection Analysis:



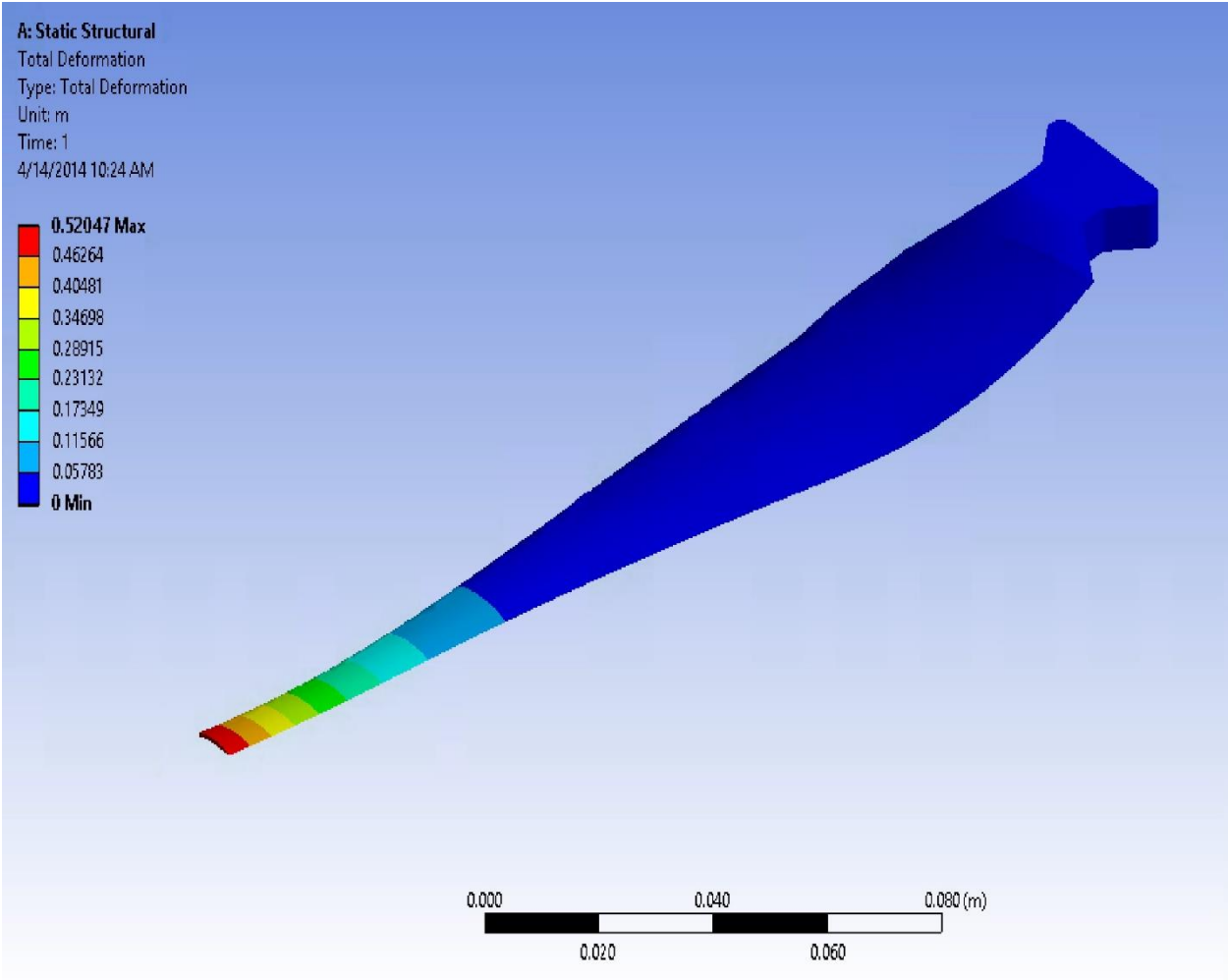
Blade Force Magnitudes and Directions:



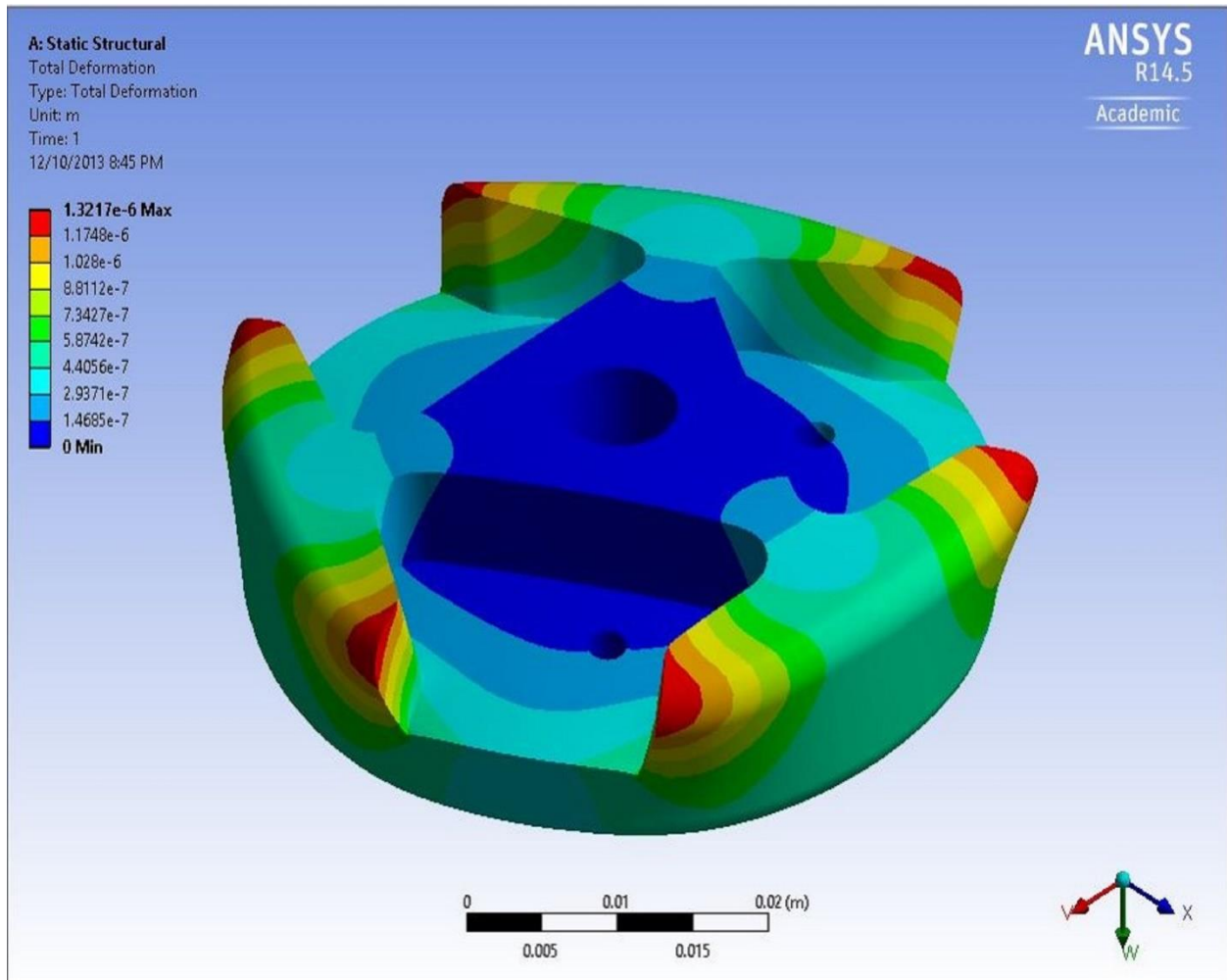
Blade Von-Mises Stresses:



Blade Deformation:

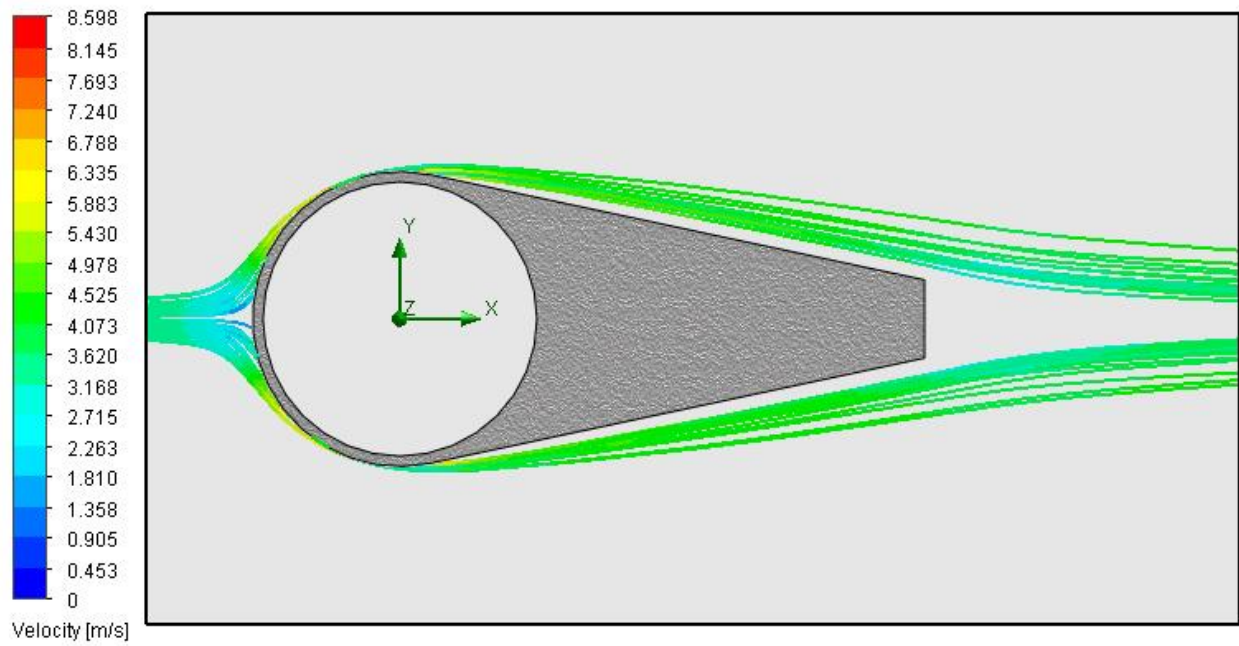


Hub Deformation:

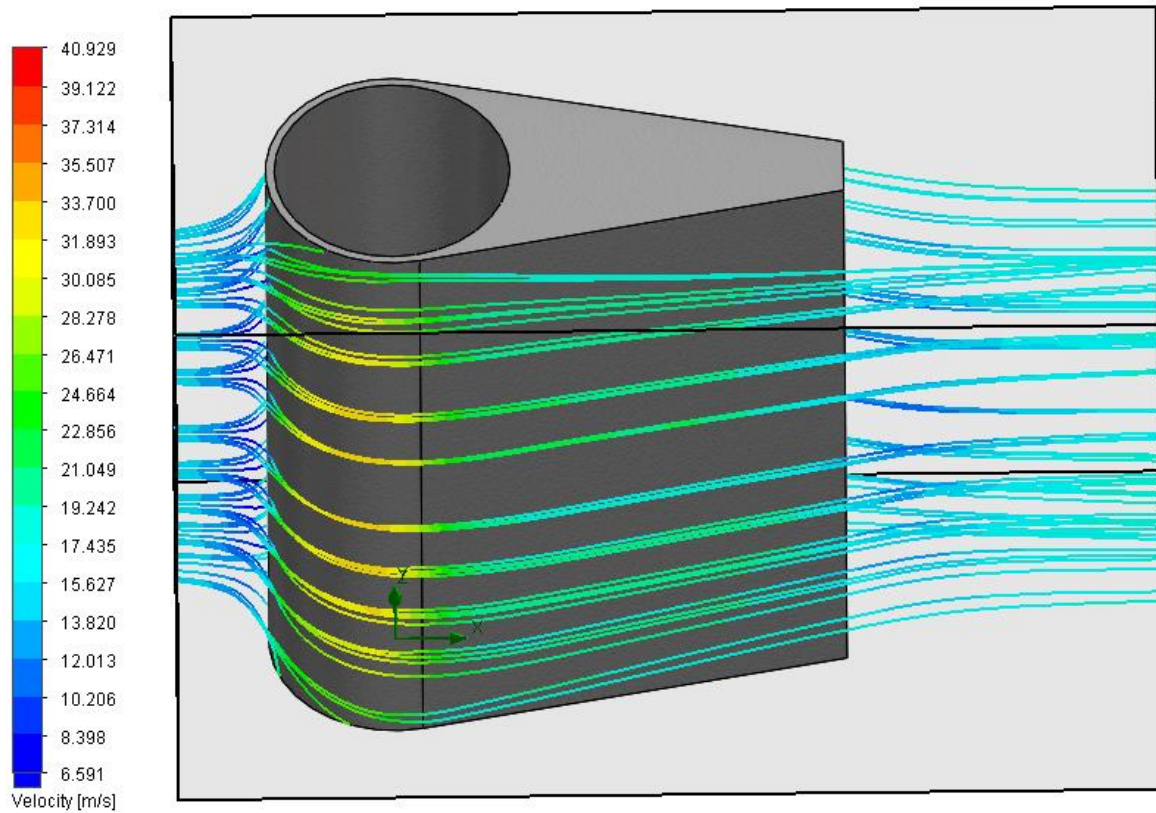


Section 3: Flow Analysis

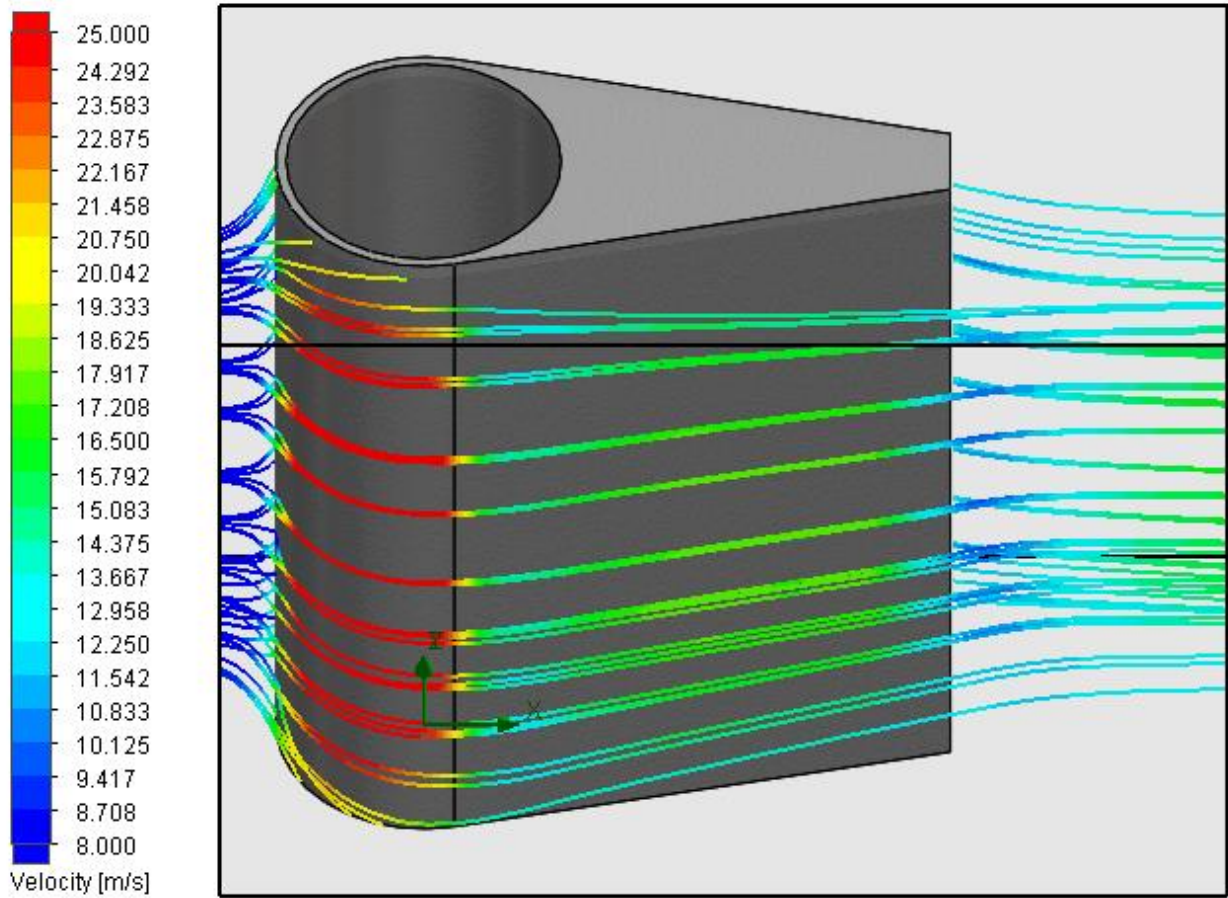
Flow Trajectories/Velocity Profile for 4m/s:



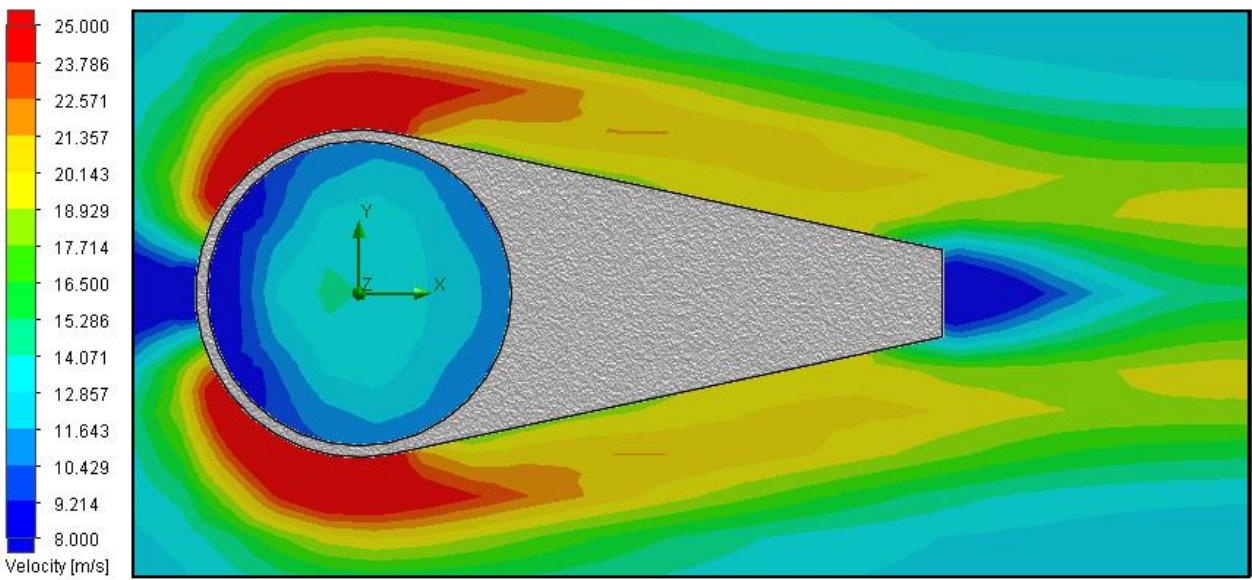
Flow Trajectories/Velocity Profiles for 17m/s:



Flow Trajectories/Velocity Profiles for 12m/s:



Velocity Contour Plot 12m/s:



Section 4: Electrical Diagrams

PCB Diagram:

