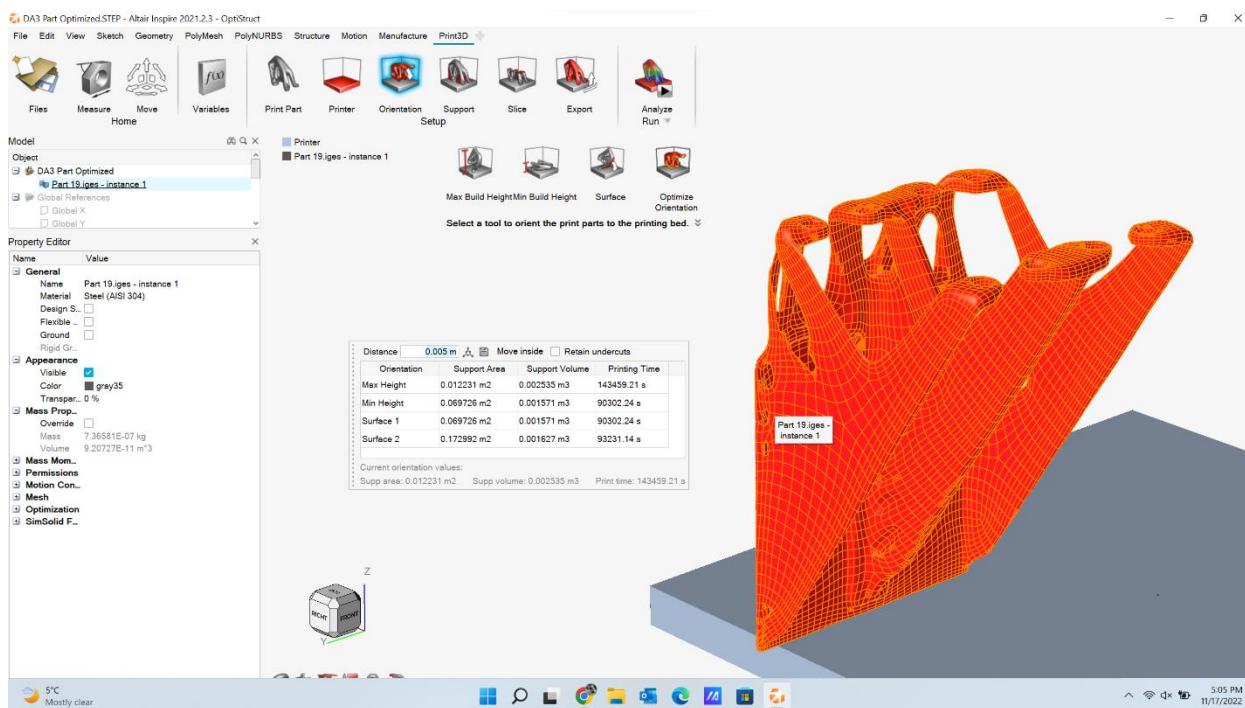


KALPAK R HEDAWOO

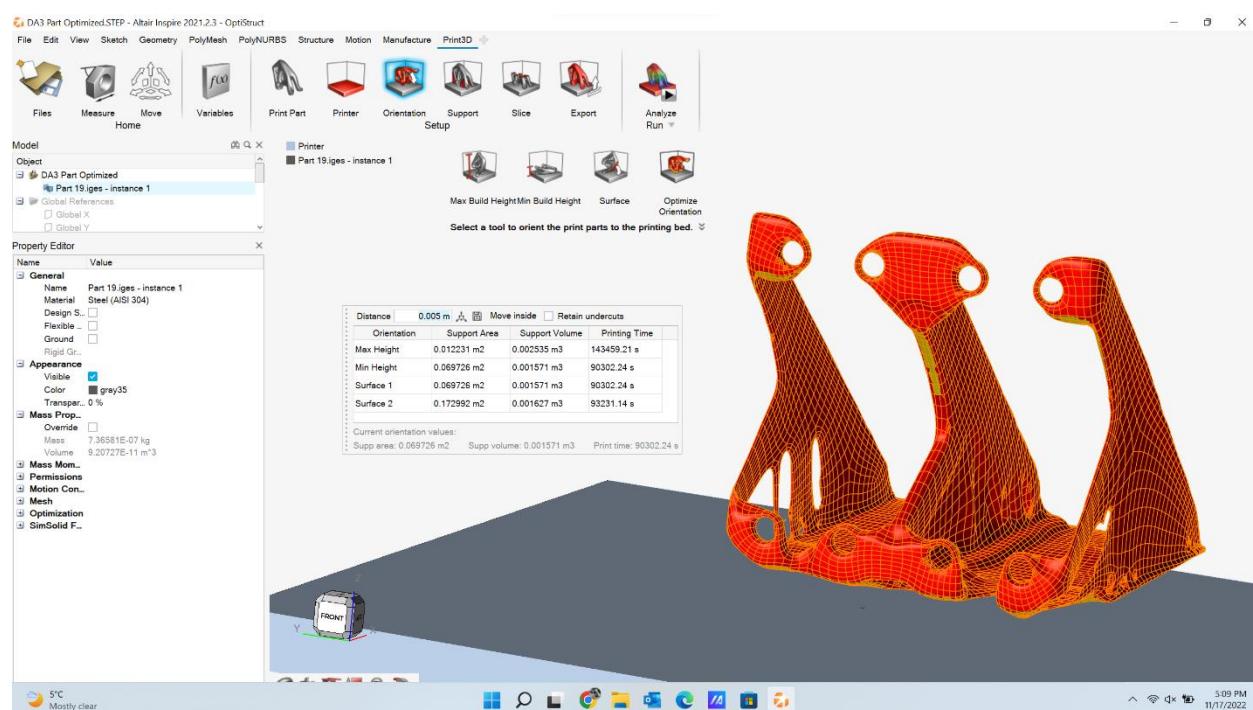
DESIGN ASSIGNMENT – 3

ME-653-DESIGN FOR ADDITIVE MANUFACTURING

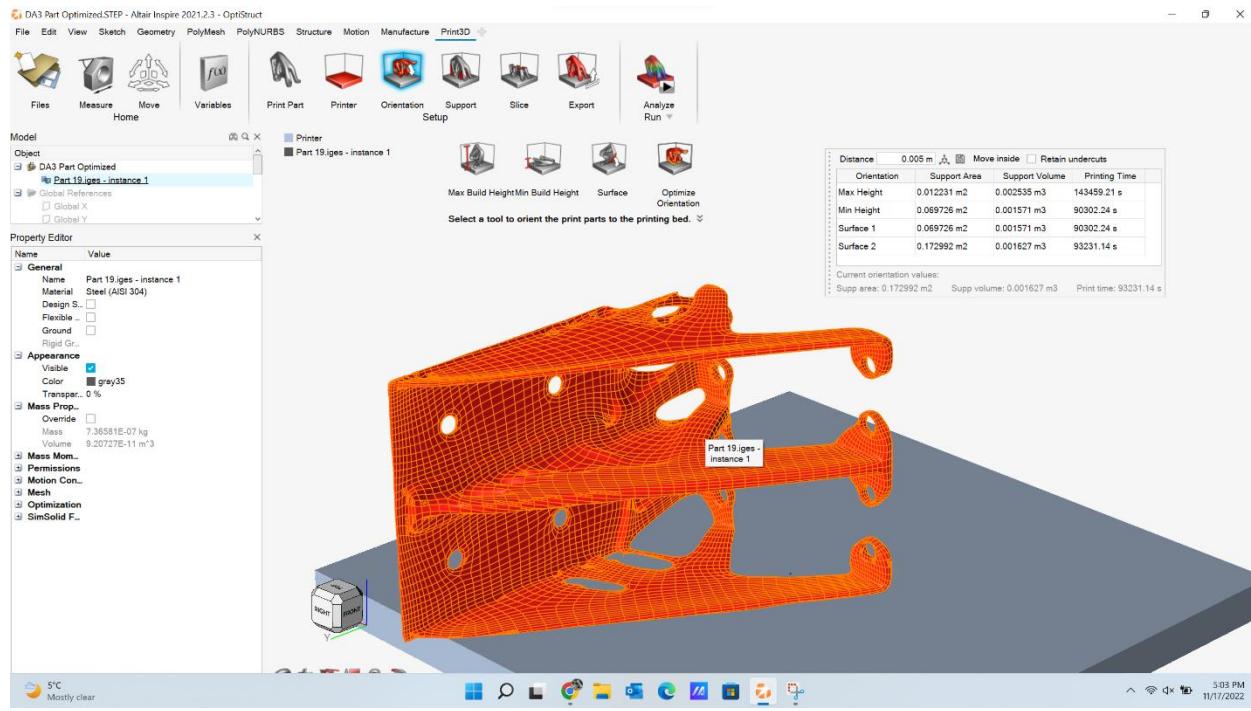
B]



O1-MAXIMUM HEIGHT ORIENTATION

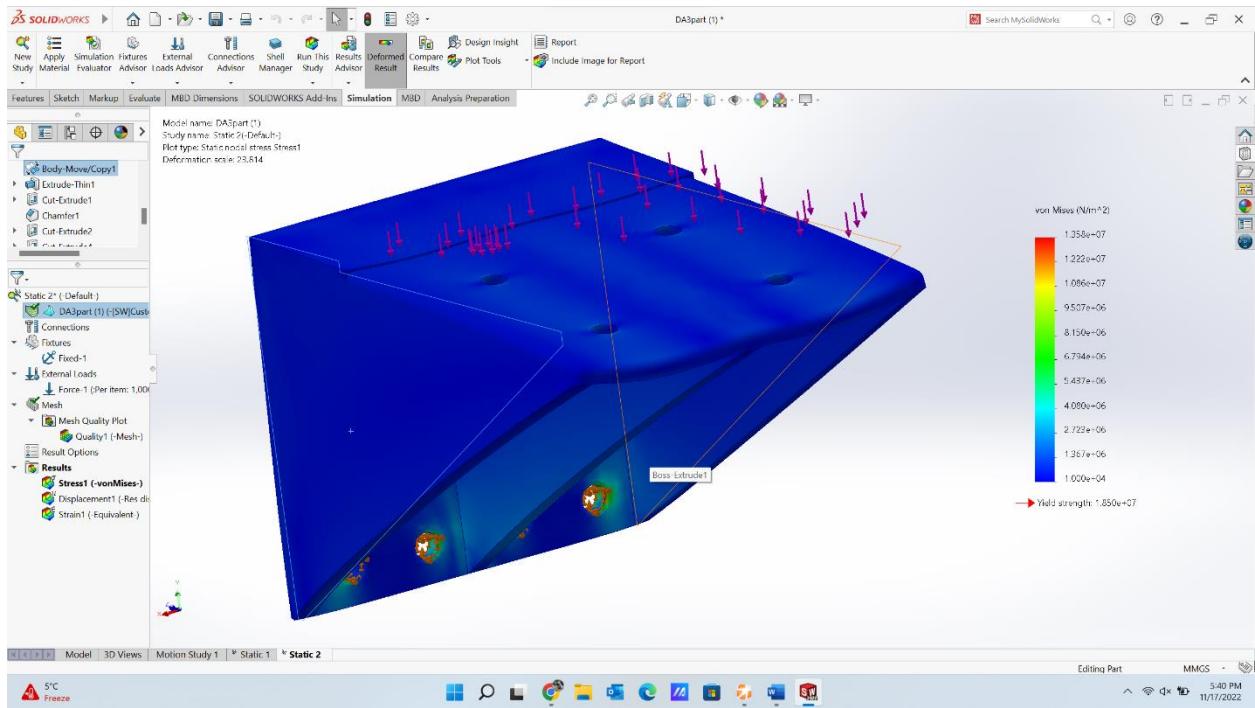


O2-MINIMUM HEIGHT ORIENTATION

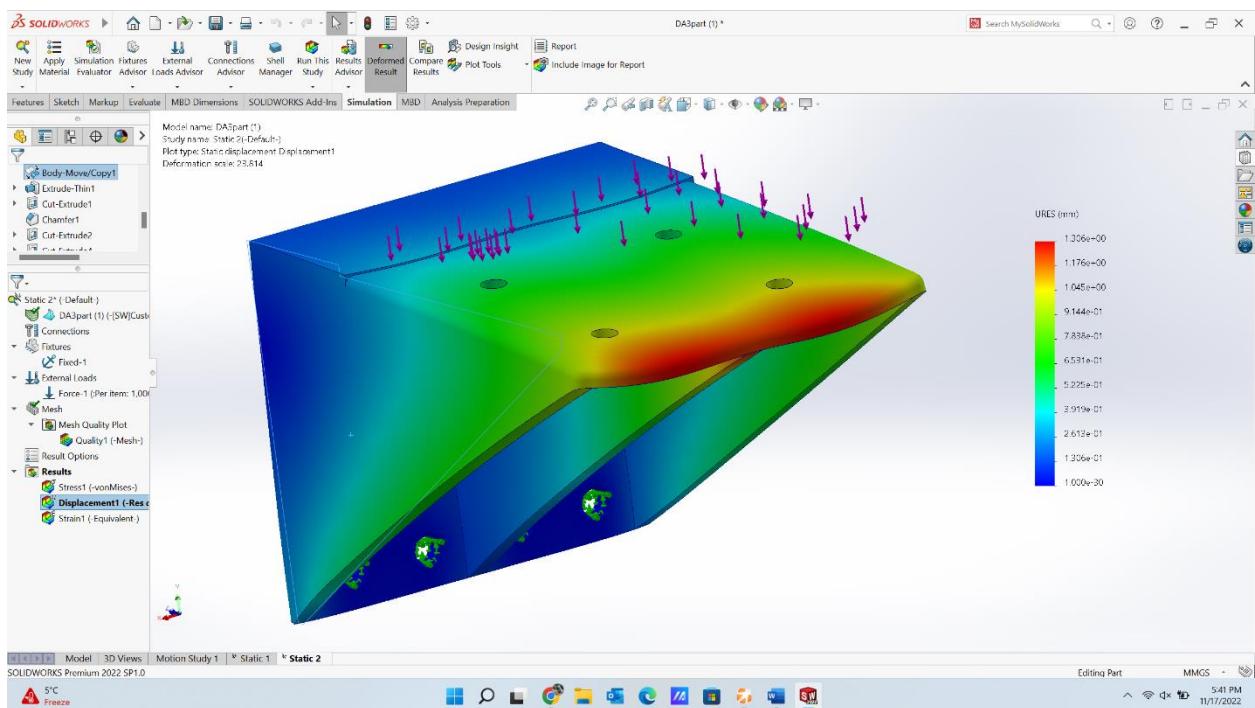


O3-ORIENTATION BASED ON A PARTICULAR SURFACE

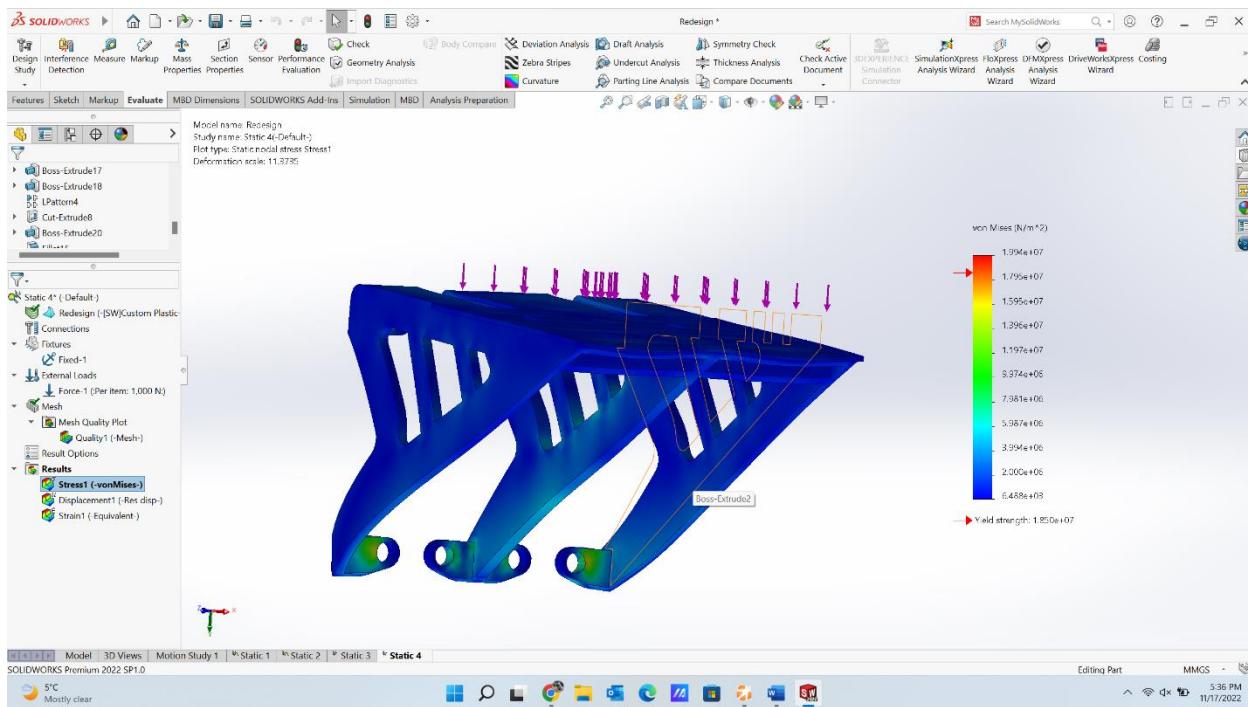
Category / Criteria	Orientation 1	Orientation 2	Orientation 3
Build time	143459.21 s	90302.24 s	93231.14 s
Support material	0.002535 m³	0.001571 m³	0.001627 m³
Surface quality	High	Medium	Low
Printing cost	High	Low	Medium
Mechanical Performance (Qualitative Assessment)	High	Medium	Low

D]

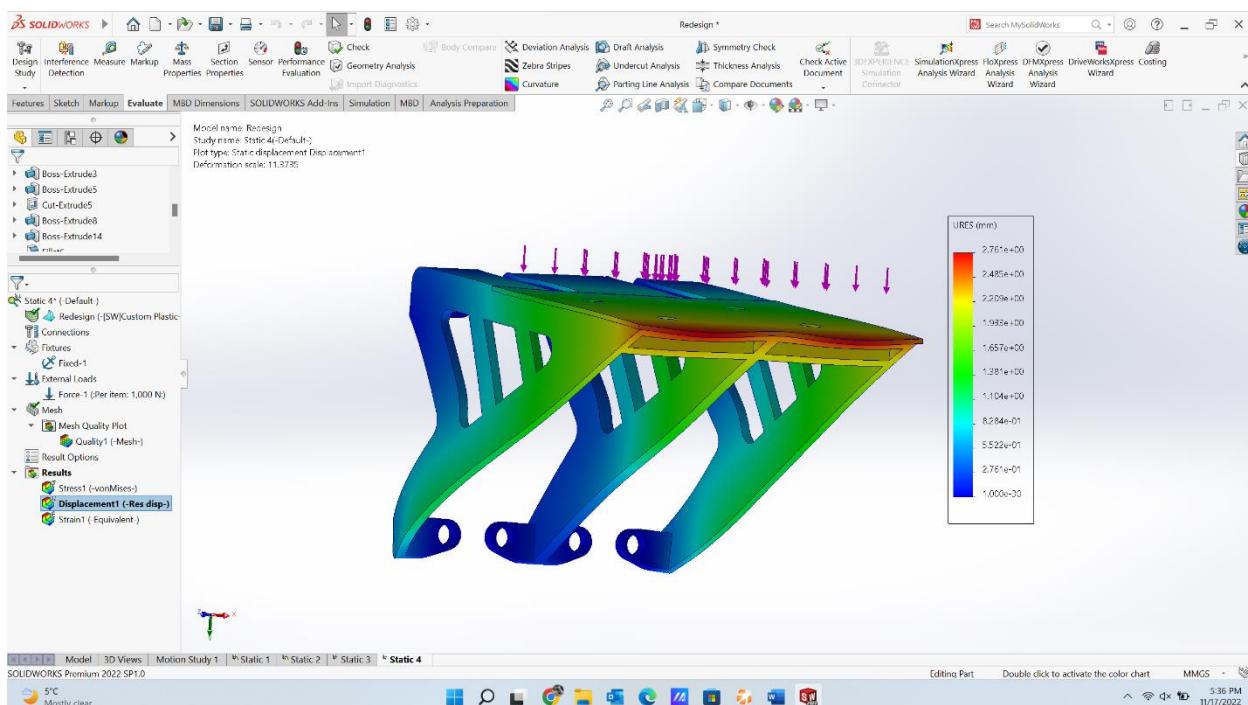
ORIGINAL DESIGN VON MISSES STREES ANALYSIS



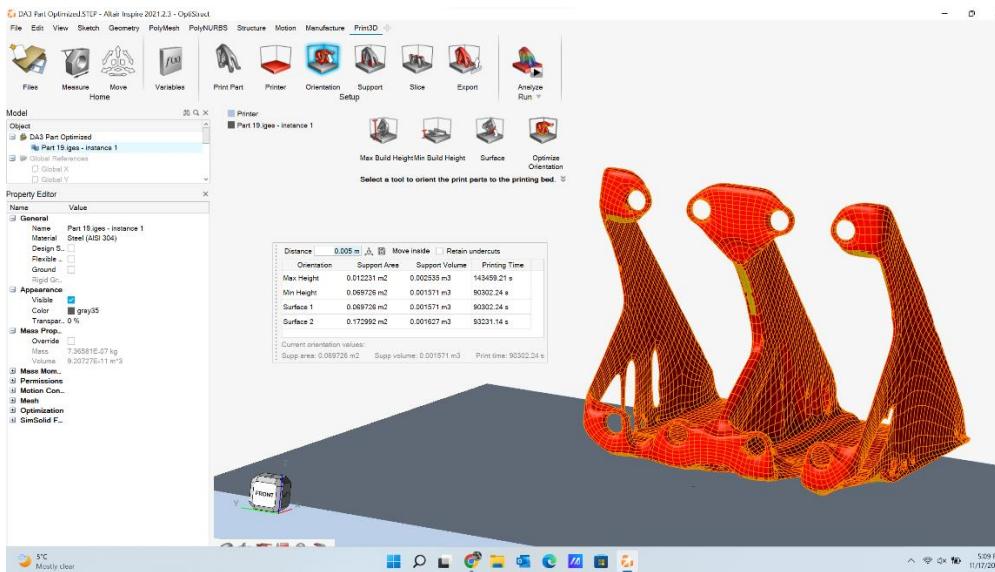
ORIGINAL DESIGN DISPLACEMENT ANALYSIS



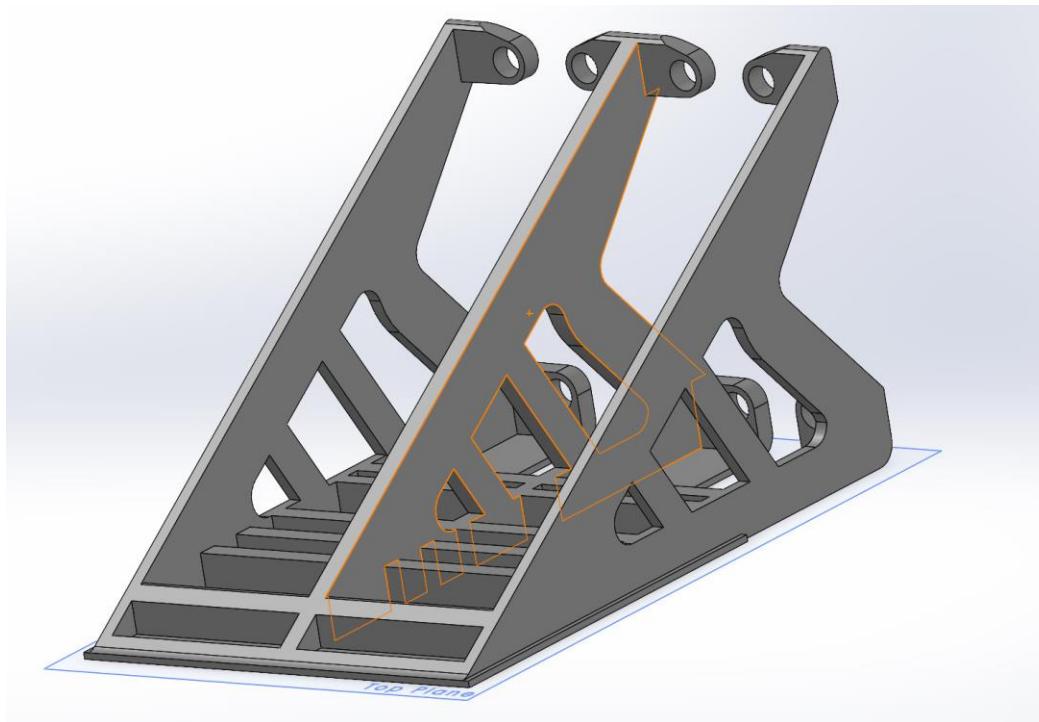
RE-DESIGN VON MISSES STRESSES ANALYSIS



RE-DESIGN DISPLACEMENT ANALYSIS



ORIENTATION SELECTED



RE-DESIGN

Category / Criteria	Original Design	Topology Optimization	Redesign for AM
Weight (grams)	1842.89	1234.36	890.18

Max Von-Mises Stress (N/m ²)	1.334x10 ⁷	1.765x10 ⁷	1.994x10 ⁷
Max Displacement (mm)	1.304	2.913	2.761