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Introduction:

This document demonstrates tests that were done to ensure the Step Deck EOR Bricking Machine is safe to use up to 6000kg load on the platform with a safety factor of three. The working platform was analyzed with a finite element analysis tool on SolidWorks with 100% load and it was confirmed with a 200% weight load test before the machine was shipped to the customer.

Finite Element Analysis:

SolidWorks (SW) finite element analysis (FEA) was used to confirm tube sizes used were able to hold 100% of distributed load with a safety factor of more than three. The platform frame is in its largest configuration (4.8m) and is modeled as a solid body to simplify the analysis. The arch panels are removed and modeled as extra weight in the FEA model. A **total load of 22052 lbf** was distributed across the deck frame beam. Refer to f*igure 1* for the FEA analysis with the factor of safety results. Platform has a minimum **safety factor of (FOS) 7.4** with 100% of rated capacity.

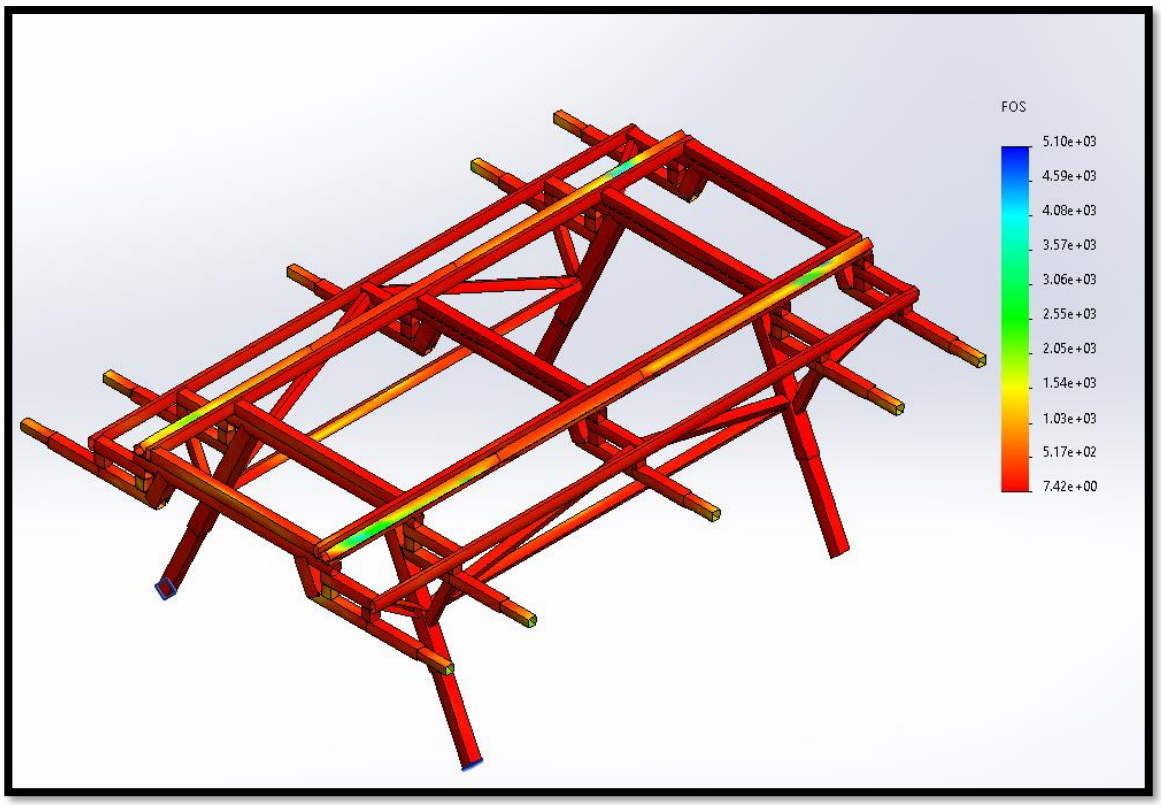

Figure 1. 21813-2 work platform factor of safety (FOS) results.

Load Testing:

The arch panel was removed to make room for the weight blocks. The work platform was loaded with weight blocks that are equal to 200% of the rated load. The test fixture shown in f*igure 3* was used to simulate the work platform sitting in a kiln. The weight blocks were loaded onto the work platform one by one, and the center beam deflection was measured after the blocks were put on the platform. f*igure 4 and figure 5* show weight blocks loaded on the work platform. A total of **6 blocks weighing 25876lbf** got loaded on the platform which is about twice the recommended load capacity.

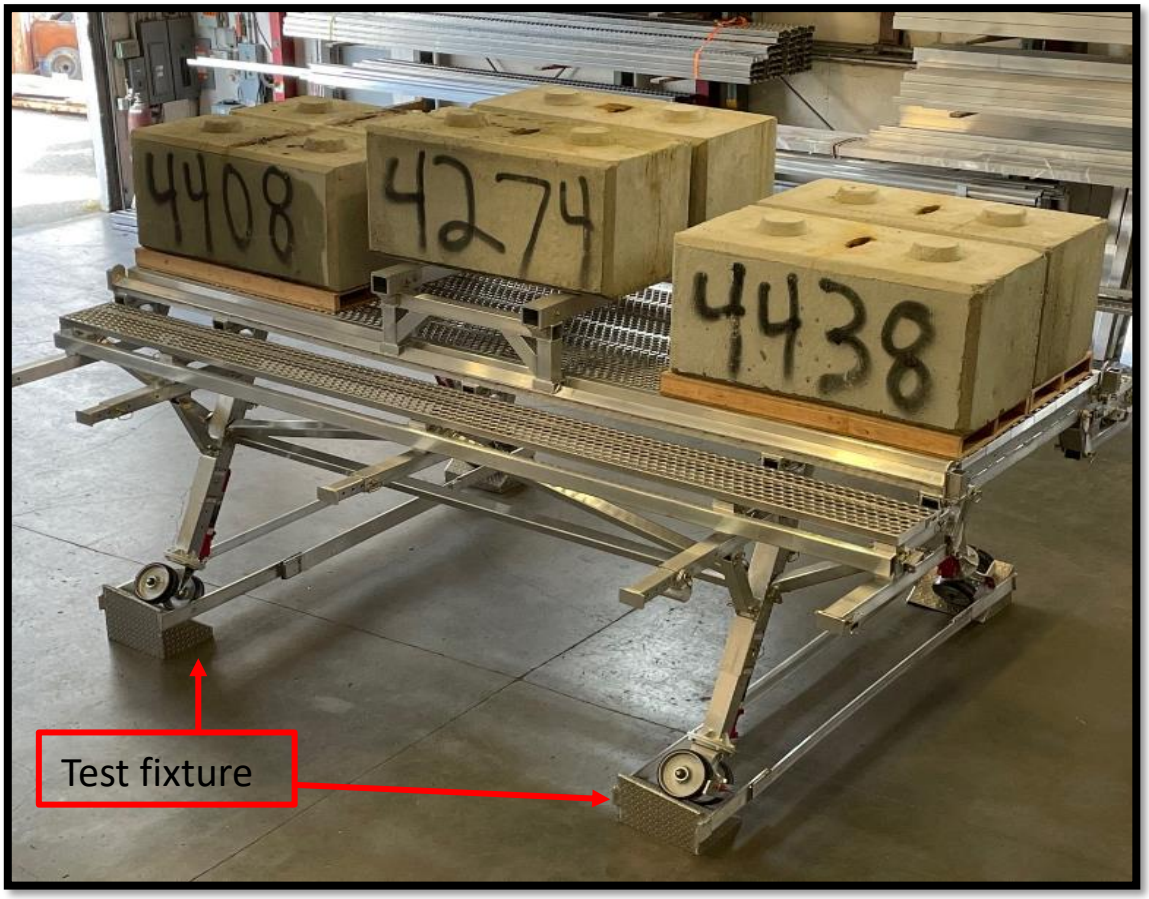

Figure 4. work platform frame with weigh blocks

Figure 5. work platform frame with weigh blocks

Collected Data:

Beam deflection was measured from the bottom of the deck support beam to the floor refer to *figure 6*. Refer to *Table 1* for collected beam deflection that shows measured deflection after weight blocks are loaded on the platform. This deflection is not a concern because the material did not yield.

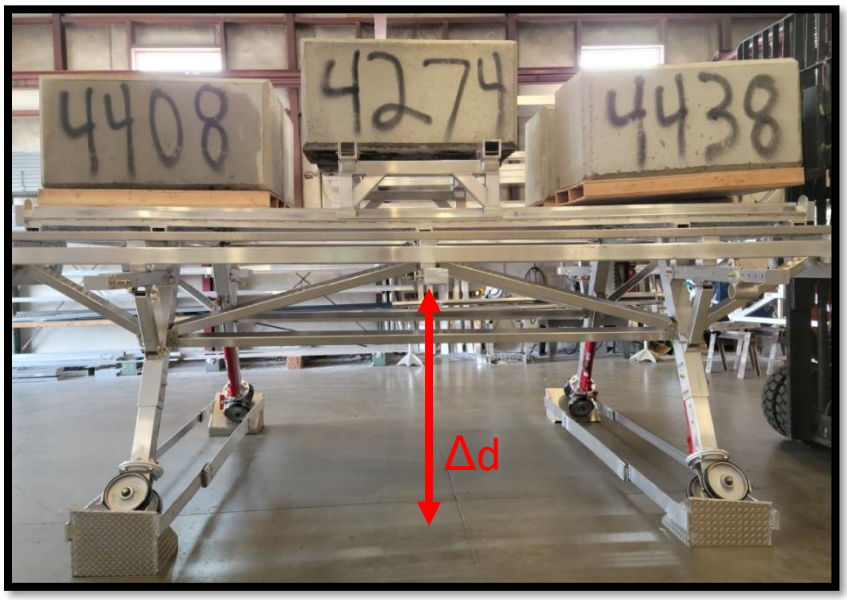

Figure 6. Deflection measurement point

Figure 7. Deflection measurement point

#	LOAD (LBf)	Δd (inches)
1	4408	0
2	4344	0.3
3	4274	0.7
4	4196	-
5	4438	-
6	4344	~1.5

Table 1. deflection measurements

Conclusion:

SolidWorks FEA estimation proves the selected tube sizes for this machine are capable to withstand 100% load with a minimum **safety factor of 7.4**. In-house 200% weight loading test confirmed that the machine is **safe to use for the specified capacity of 6000kg.**