

Eno Shira Pre Junior - Drexel University - Mechanical Engineering

Manufacturing Engineer
Eaton Aerospace
April 2019 – September 2019



Responsibilities at Eaton

- Develop floor plans for the 2nd floor assembly,
 1st floor shop and test labs
- Run time studies for cost-out justification for new assembly laser
- Design fixtures for use in the shop and assembly floors
- Use Vinyl Cutter for the creation of masking templates to be used in the Paint room



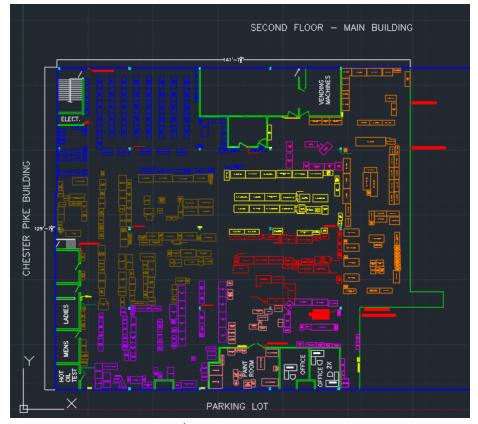
Responsibilities at Eaton

- Reverse engineer fixtures
- Participate in paint room, lubriclone packaging engineering and cell C RIEs
- Creation and revision of MIs
- 3D print designed fixtures for implantation and testing purposes
- Conduct 5S+ audit for manufacturing engineering



Project #1 – Floor Layouts

- Problem: More efficient way to conduct RIEs
- Solution: Develop floor plans for 1st and 2nd floor as well as the test labs





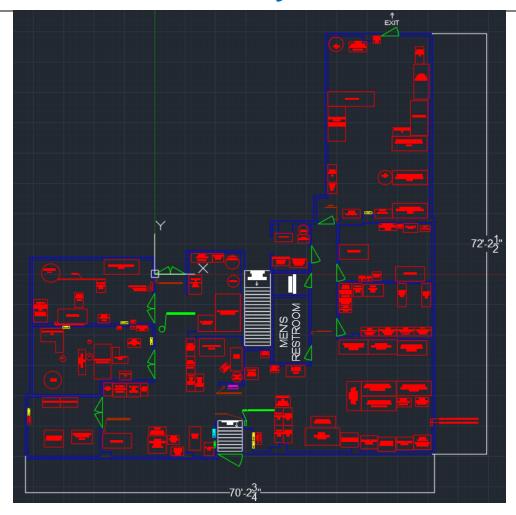
Project #1 – Floor Layouts



1st Floor Layout



Project #1 – Floor Layouts



Test Labs Floor Layout



Project #2 – Time Studies for Laser Assembly

- Problem: Cost-outs needed for new laser justification
- Solution: Conduct time studies for current assembly laser

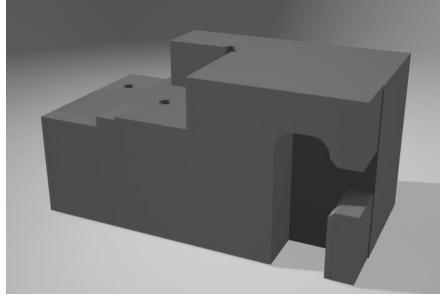
Time Observation Chart				Operator : Mike Valecce										
Process : Laser Marking	P/N :		OP:		Analyst:	Eno Shira	<u> </u>				Date :	7/29/2019		
Work Element	Lap Time Element	1	2	3	4	5	6	7	8	9	10	Task Time		Comments
1 Load Part Into Laser	Press Start Button	12	59	104	149	193	238	281	326	371	413	9		
			+			_								
2 Mark Part	Touch Door to Open Laser	42	89	133	179	223	267	311	356	400	442	30		
		30	30	29	30	30	29	30	30	29	29	00		
3 Unload Part	Touch Next Part	49	95	139	184	230	273	317	362	405	447	6		
		7	6	6	5	7	6	6	6	5	5			
Total Time		49	46	44	45	46	43	44	45	43	42	45		
Comments														
	Process: Laser Marking Work Element Load Part Into Laser Mark Part Unload Part Total Time	Process: Laser Marking Work Element Load Part Into Laser Mark Part Unload Part Touch Door to Open Laser Unload Part Touch Next Part	Work Element Lap Time Element 1 Load Part Into Laser Press Start Button 12 Mark Part Touch Door to Open Laser 42 Unload Part Touch Next Part 49 Total Time 49	Work Element Lap Time Element 1 2 Load Part Into Laser Press Start Button 12 59 Mark Part Touch Door to Open Laser 42 89 Unload Part Touch Next Part 49 95 Total Time 49 46	Work Element Lap Time Element 1 2 3 Load Part Into Laser Press Start Button 12 59 104 Mark Part Touch Door to Open Laser 42 89 133 Unload Part Touch Next Part 49 95 139 7 6 6 Total Time 49 46 44	Work Element Lap Time Element 1 2 3 4 Load Part Into Laser Press Start Button 12 59 104 149 Mark Part Touch Door to Open Laser 42 89 133 179 Unload Part Touch Next Part 49 95 139 184 7 6 6 5 Total Time 49 46 44 45	Process : Laser Marking	Process : Laser Marking	Process : Laser Marking P/N :	Process : Laser Marking	Note Process : Laser Marking P/N : OP : Analyst: Eno Shira	Process : Laser Marking P/N :	Process : Laser Marking P/N :	Process : Laser Marking P/N :



Project #3 – Reverse Engineering Fixtures

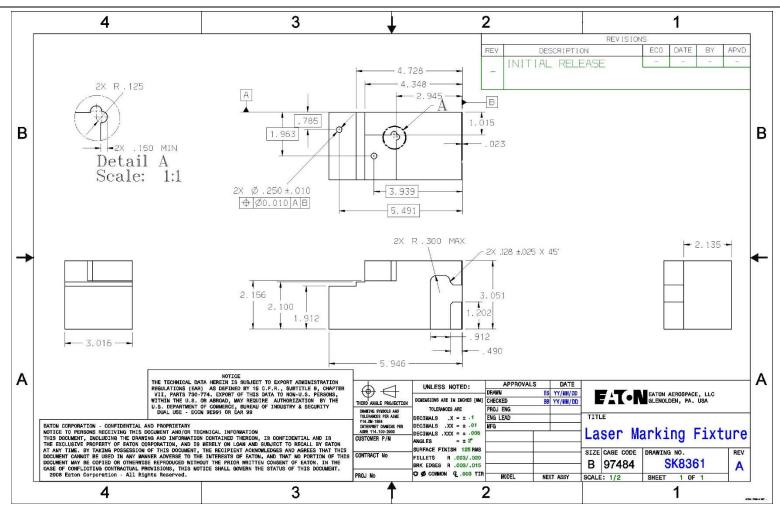
- Problem: Rofin Laser fixture needed model and drawing
- Solution: Reverse engineer existing fixture (SK8361) in CATIA and develop drawing







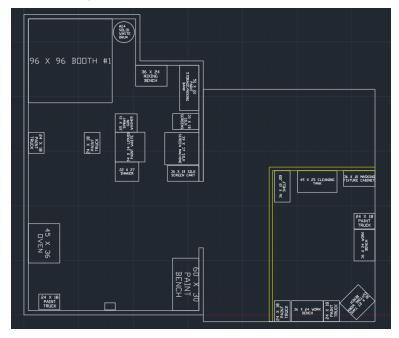
Project #3 – Reverse Engineering Fixtures

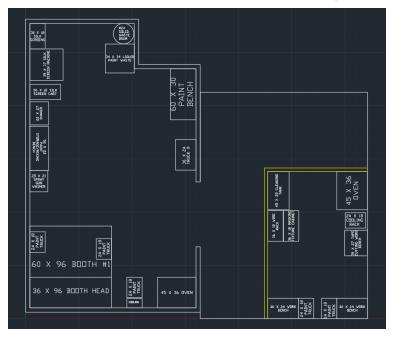


Engineering Drawing of SK8361



- Problem: Paint room workflow is inefficient
- Solution: Develop 7+ different potential layouts in AutoCAD to improve productivity

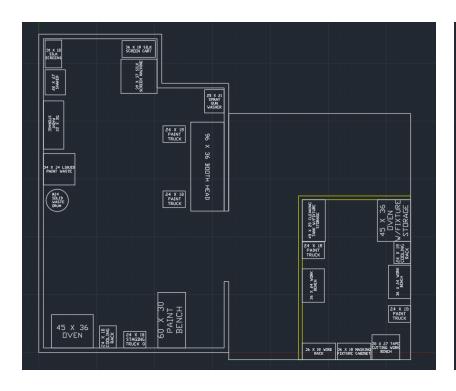


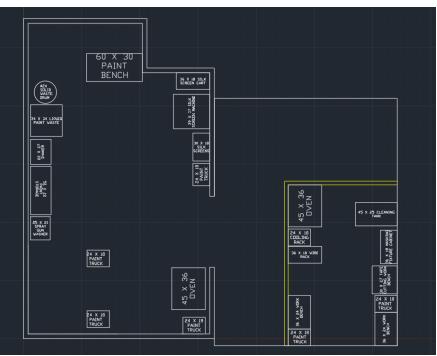


Layout A

Layout B

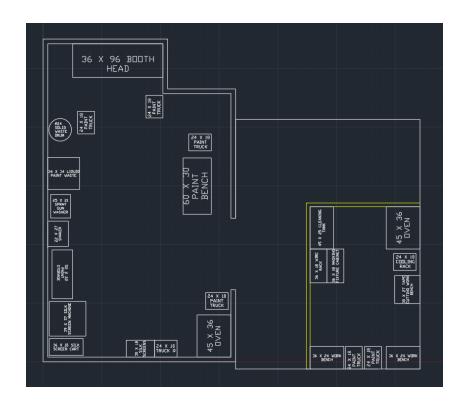


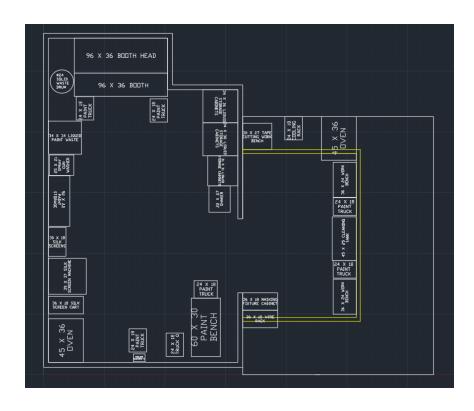




Layout C Layout D

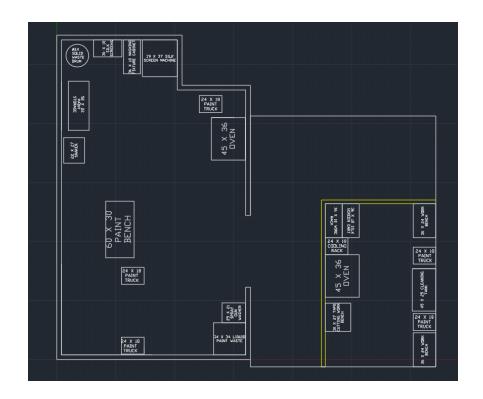


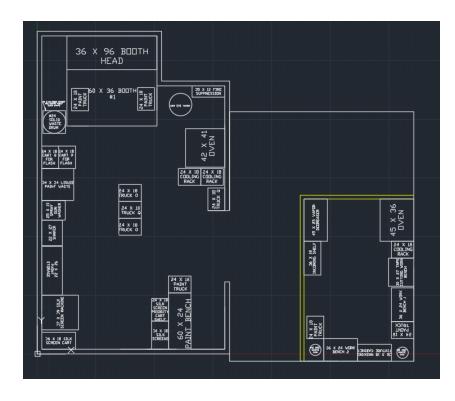




Layout E Layout F

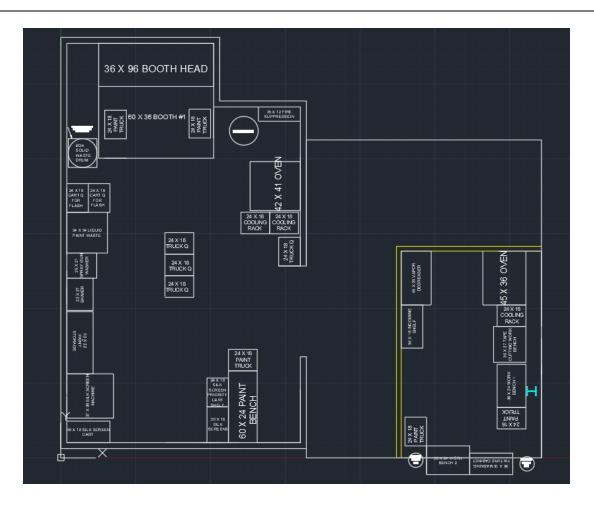






Layout G Layout H



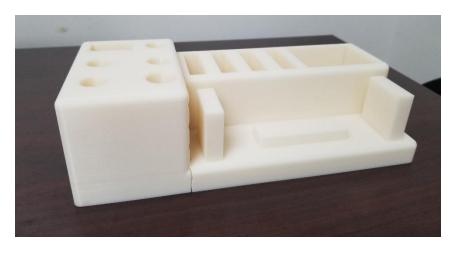


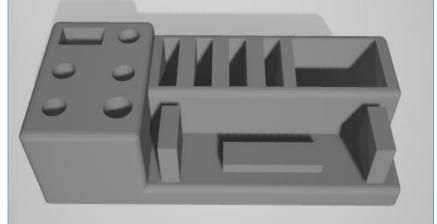
Final Layout



Project #5 – Tool Caddies

- Problem: Lack of organization of tools for SCU and Cable Lines
- Solution: Develop Tool Caddies to free up workbench space

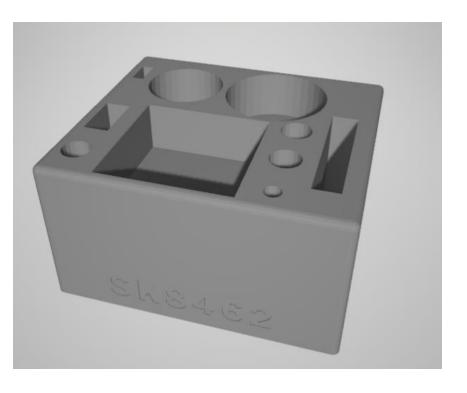


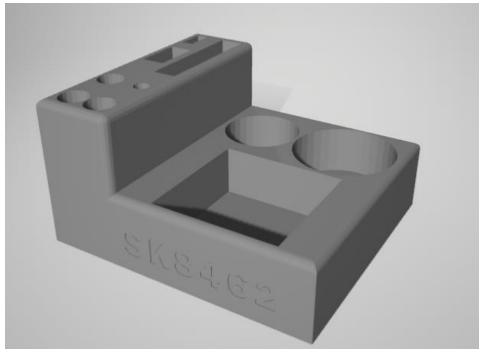


SCU Caddy 3D Print

SCU Caddy 3D Model

Project #5 – Tool Caddies





Cable Caddy 3D Model

Cable Caddy Economic Design 3D Model



Lean Tools used during my Co-op

- Standard Work
 - MI
- Time Studies
- 3P
- 5S+ Audit



What I learned

- Fixture design
- CATIA
- MI creation and revision
- How to conduct a time study
- 3D Printing
- Vinyl Cutter program usage
- How a RIE is done and its purpose



What would make this Co-op Better?

More direct mentoring of the co-op



