



Manufacturers Alliance

Sharing Education & Resources Peer to Peer

EDUCATIONAL SEMINAR

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Manufacturing Engineer

Chasing Waste

Landscape Structures, Inc
Delano, MN



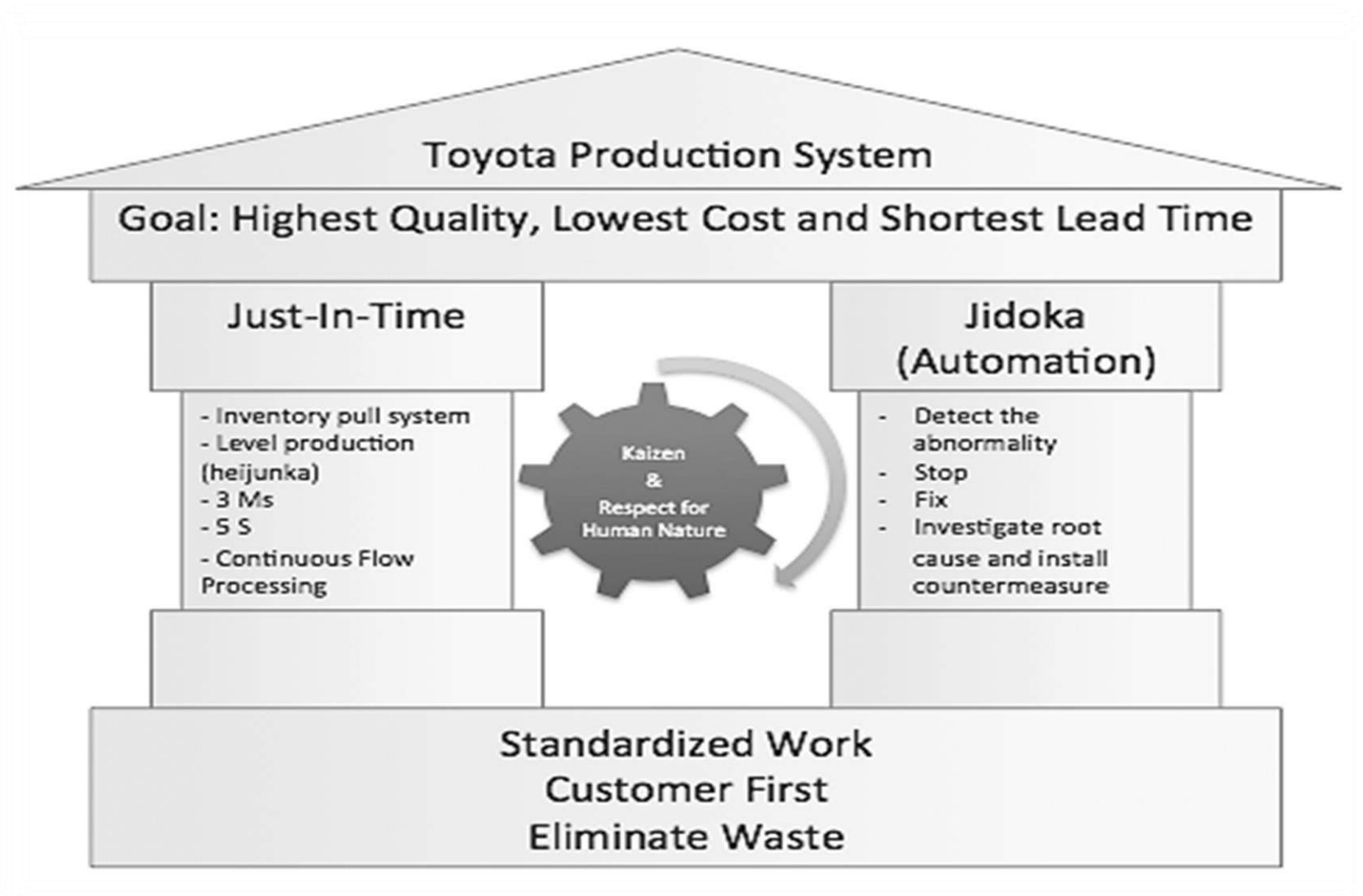
Company Overview



- Founded in 1971 by Steve & Barb King to design, produce & sell “Continuous Play” playground equipment (*no wasted play*)
- 1996 – ISO 9001 Certified
- 1998 – ISO 14001 Certified
- 1999 – Started the Continuous Improvement, Lean Journey
- 2012 – LSI becomes 100% employee owned
- 2019 – approx. 500 employees



Learning to See Waste





TIM WOODS



What is Value Added?

- Meets *Customer* need, willing to “pay”
 - Must *transform* form, fit, function of product or information
 - Must be done right the *first* time
-
- Non Value Added is anything the customer is not willing to pay for
 - Non Value added, but currently required

Training/Teaching











- Everyday Events
 - Safety, Quality, Velocity, Cost
- EMPLOYEE PARTICIPATION & OWNERSHIP
- Kaizen Events
- Product Design Review (DFMEA)
 - Standard & Custom Design
- New Equipment Purchases

Waste Walks

Waste Identification Worksheet

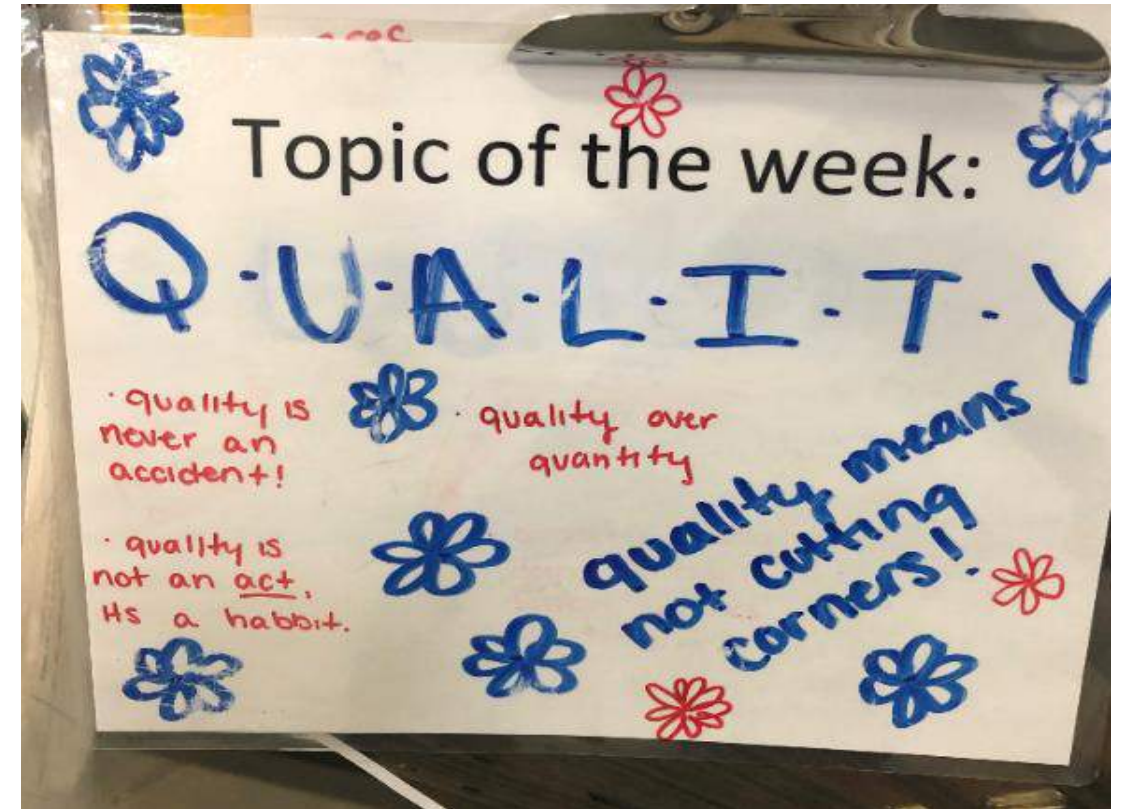
Area: _____

Date: _____

The Wastes	Definition	Examples	Observations
 Transportation	Physical or Electronic Movement of product/documentation/information from place to place	<ul style="list-style-type: none"> • Parts in and out of storage • Handoffs • To and from quality inspection • Physical delivery of information • Email 	1. 2.
 Inventories	Idle "product". Material or information not being currently processed	<ul style="list-style-type: none"> • Raw material, finished goods • Work in process • Document storage (physical or electronic) • Phone queue, voicemail, email • Purchased components • Maintenance supplies 	1. 2.
 Motion	Movement of people, information, or equipment not necessary to produce the product	<ul style="list-style-type: none"> • Searching for parts, tools, prints • Sorting through materials • Bending, reaching, twisting • Meetings 	1. 2.
 Waiting	Any time the product is not able to move immediately to the next process	<ul style="list-style-type: none"> • Waiting for parts, prints, or information • Approvals (internal or external) • Inspections • System or machine • Interruptions (fire-fighting) 	1. 2.
 Overproduction	Producing more than needed or before it is needed	<ul style="list-style-type: none"> • Batch processes • Producing to avoid set-ups • More than standard WIP • Building ahead of schedule • CC emails / FYI 	1. 2.
 Overprocessing	More work done or higher quality than customer requires	<ul style="list-style-type: none"> • Multiple cleaning or handling • Over-tight tolerances • Awkward tool or part design • Multiple copies or approvals • Added features or documentation 	1. 2.
 Defects	Work that contains errors, rework, mistakes or is missing necessary items	<ul style="list-style-type: none"> • Scrap / Rework • Corrections • Design Errors • Missing information • Missing parts 	1. 2.
 Skill	Not fully utilizing the talents and knowledge of employees	<ul style="list-style-type: none"> • Boring/tedious work • Not involved in decisions • No training or advancement • Inadequate business tools 	1. 2.

Employee Participation, Empowerment & Ownership

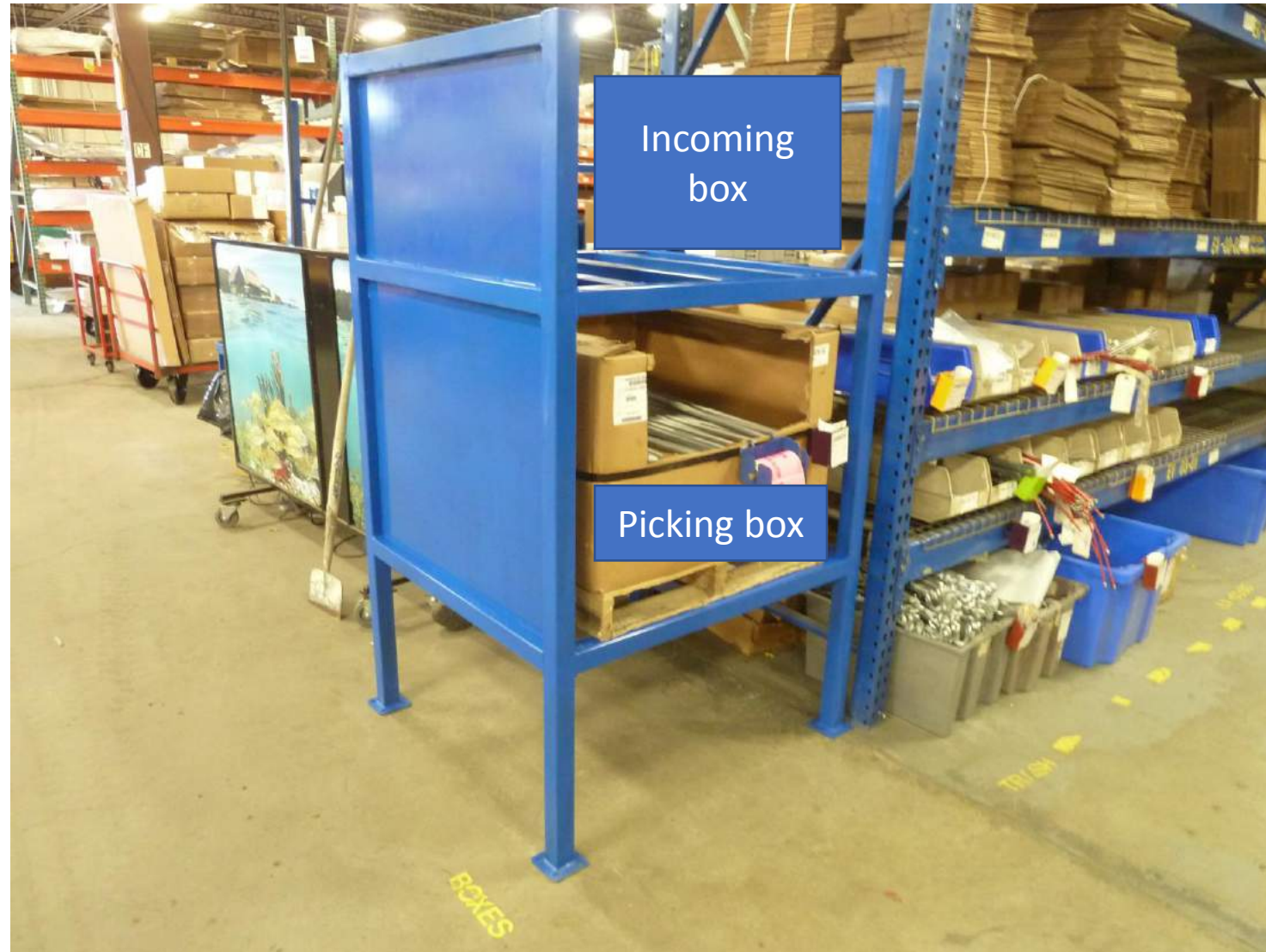
- Kaizen events
- Control Plans
- Monthly Team Production update reports
- CI Newspapers
- Topic of the week
- 5S
- 2 Second Lean



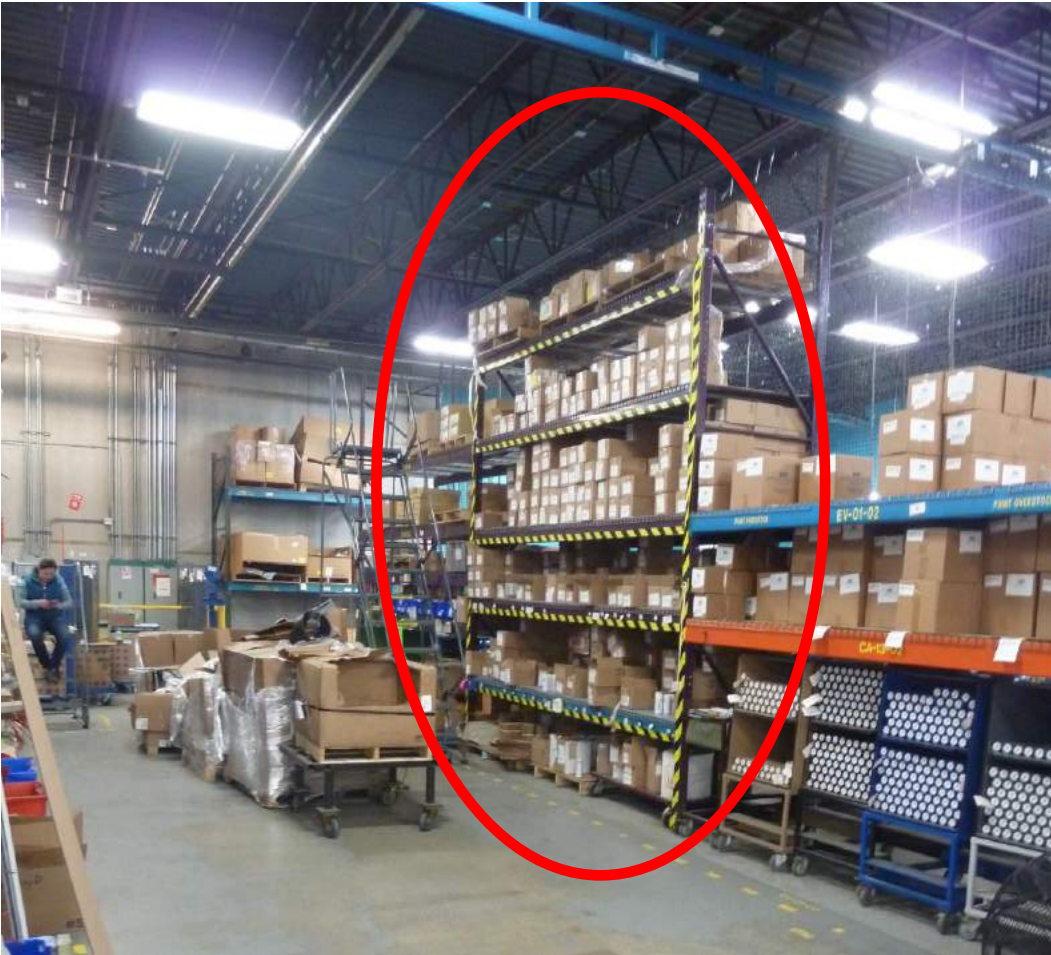
2 Second Lean



Transportation – Safety Stock Storage



Inventory



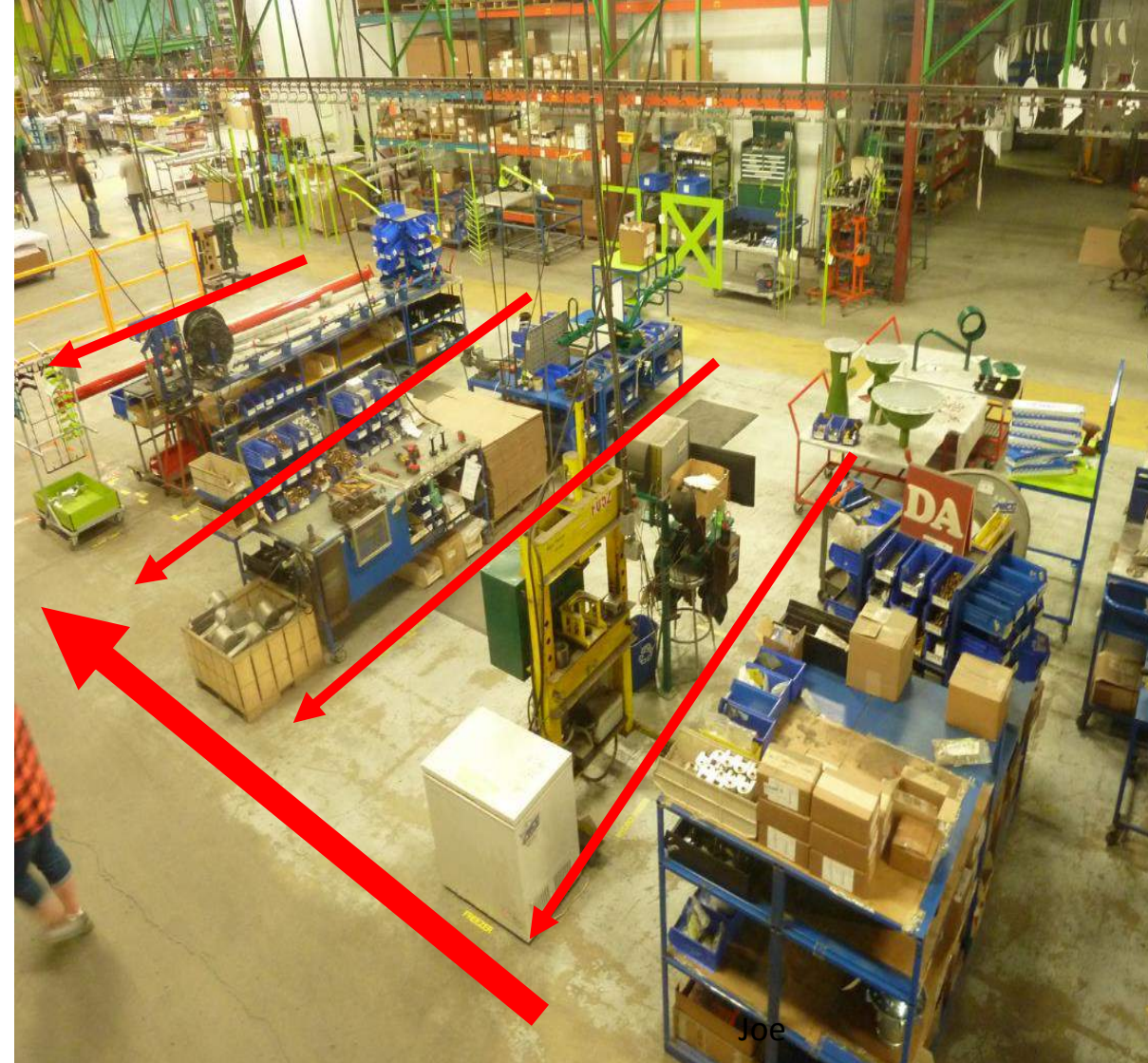
MOTION - Kaizen Improvement



Before



After



Point of Use Assembly

Process Step/Spaghetti Map Combination Sheet

Start Time:

Stop Time:

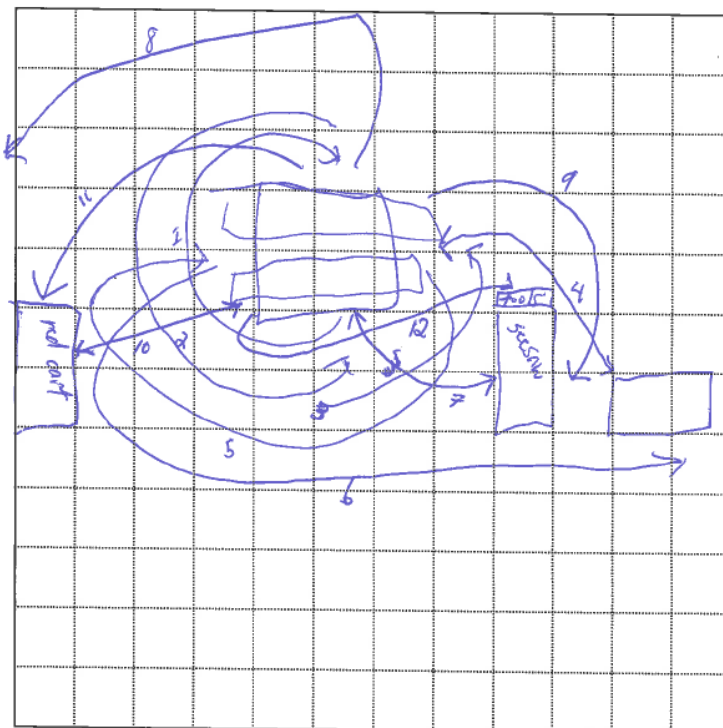
Process: Wt Saw Arms

Date: 3/19

Observer: Joe

Step/Description Problems/Waste

- 1.
- 2.
- 3.
4. Rubber Mallet movement
- 5.
6. Diff. drill movement
7. drill extension movement
8. help Dave move
9. laser cut sheet metal
10. retrieve center 18536
11. cylinder rod install base halves
12. bigger mallet
- 13.
- 14.
- 15.

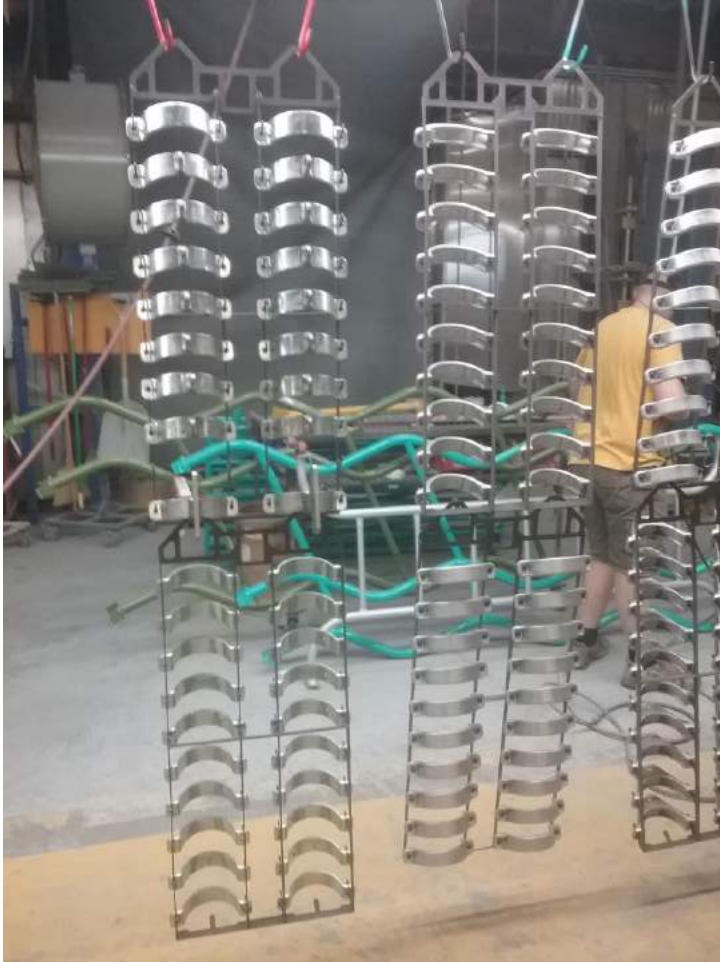


Total Process Time: 19:09





Paintline Density Optimization



Overprocessing



Dirty Bend Die



Dirty Part



Tube Sanding





Defects – FPY analysis

- Trend Data
- React
 - Light Paint
 - Paint reformulation
 - New equipment
 - Training
 - Supplier consultations
 - Contamination
 - Incoming material cleanliness
 - Cleaning at load station

5S - Before



5S - After

- Declutter entire 500 Assembly
- Label material bin & Assembly stations
- Established “over stock” location external from w/c
- Restructured workstation to reduce walking
- Reorganized & create drop off zones (In/Out)



Conclusion

1. Go – See – Act
2. Teach
3. Empower
4. SUSTAIN



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Thank you for joining us!