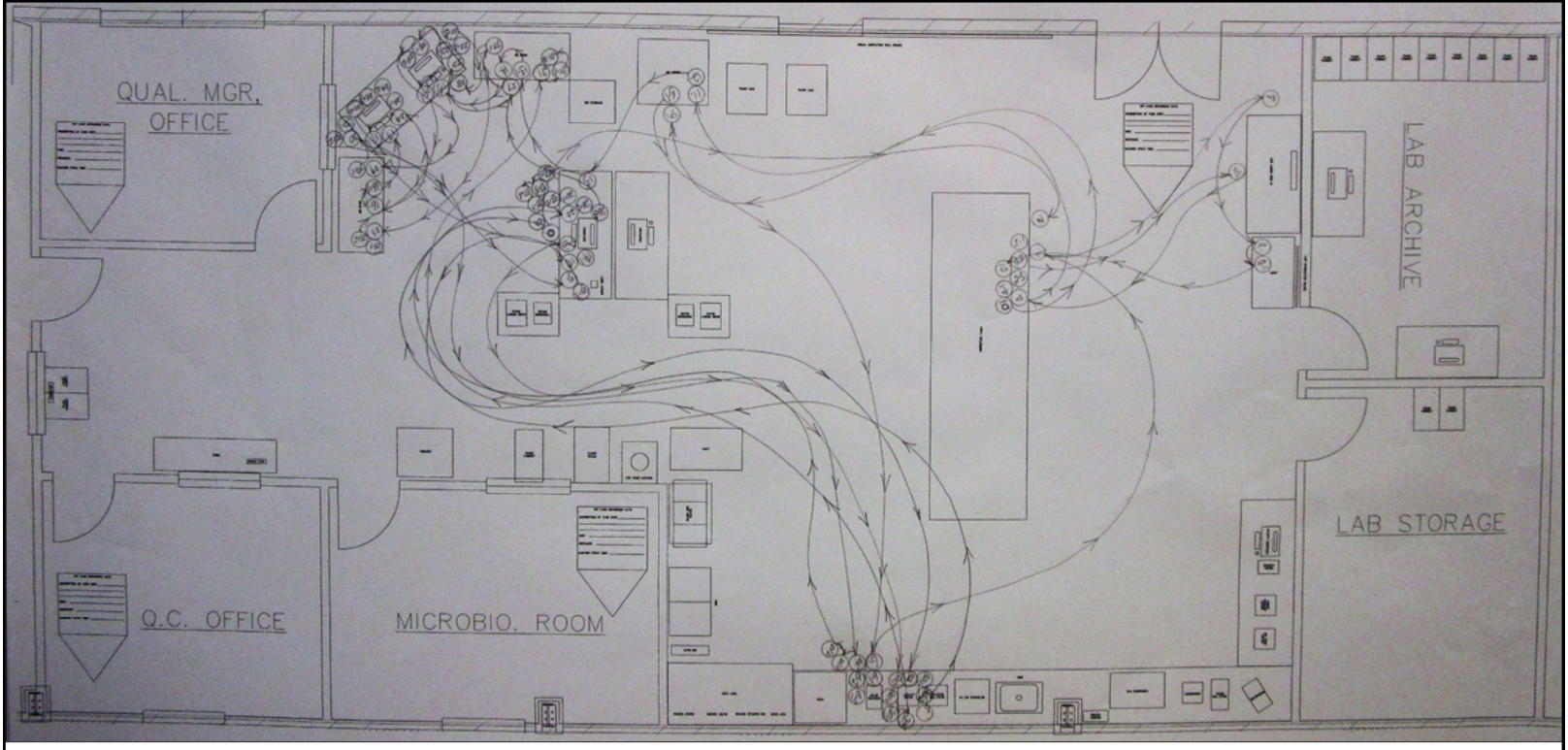
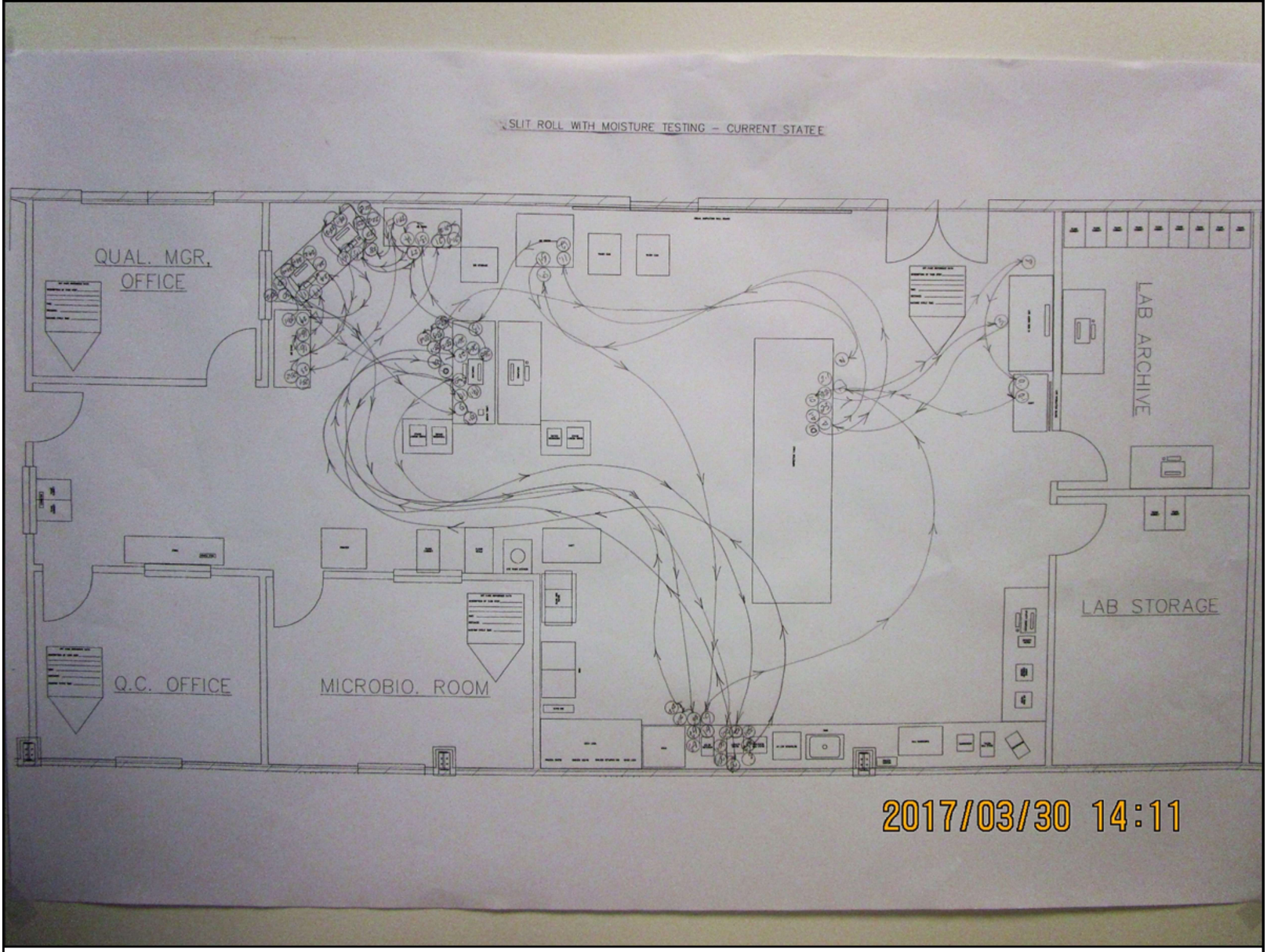


JOB TASK:	Testing 1, 2 , 3		
APRAISER:	Jane and Jon Doe	DATE :	03 / 28 / 17
OPERATOR:	Jon Doe	STATE :	Current
LOCATION:	Quality Lab		

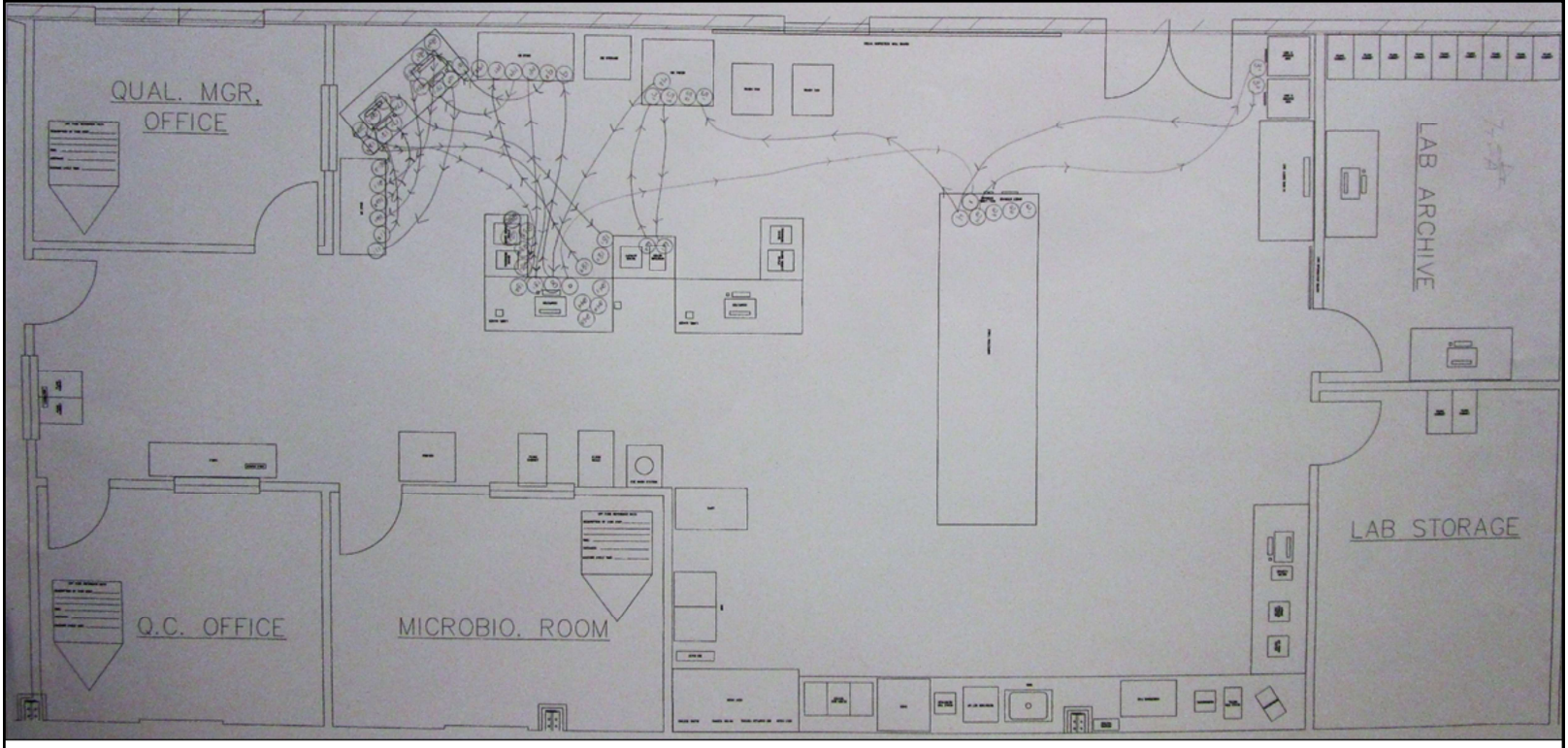
TASK STEP NO.	TASK DISCRIPTION	MAN TASK TIME H	M	S	TASK DISTANCE FEET	AUTO TASK TIME H	M	S	NOTES
	Days per year	3	0		370				Miles per year

Current state spaghetti map diagram of a quality lab testing procedure. Stacking this up by multiplying by shift, by day, by week, by month, by year it quickly went into miles per year that the lab technician walked doing this testing procedure – 370 miles per year! 30 days!

Googling mapping this distance it was the equivalent of walking from Greenville, SC to Myrtle Beach, SC and 1/4 of the way back again. A lot of walking.



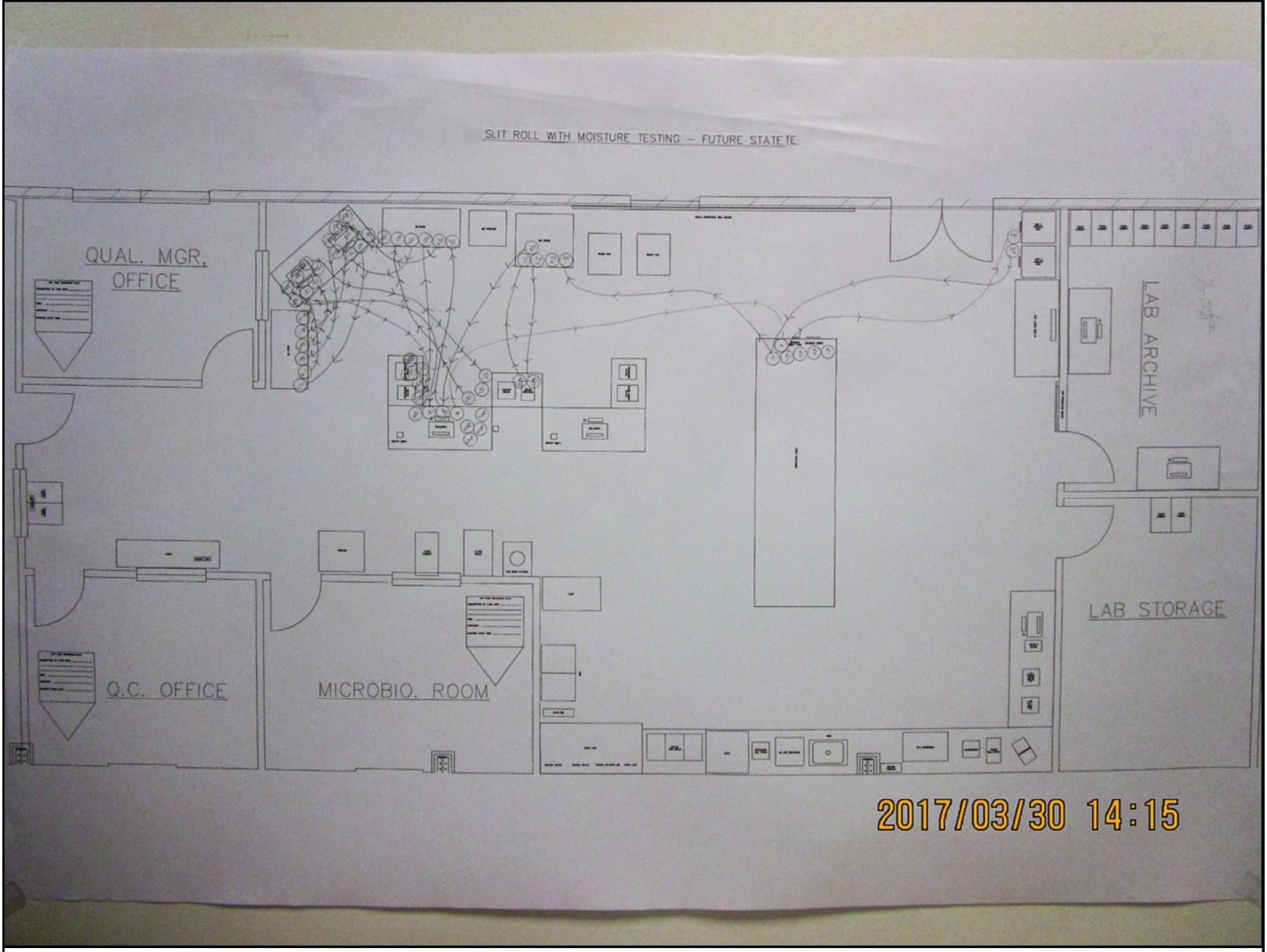
Closer look at the Current State Map.



JOB TASK:	Testing 1, 2 , 3		
APRAISER:	Jane and Jon Doe	DATE :	03 / 29 / 17
OPERATOR:	Jon Doe	STATE :	Future
LOCATION:	Quality Lab		

TASK STEP NO.	TASK DISCRIPTION	MAN TASK TIME H	MAN TASK TIME M	MAN TASK TIME S	TASK DISTANCE FEET	AUTO TASK TIME H	AUTO TASK TIME M	AUTO TASK TIME S	NOTES
	Days per year 27				208				Miles per year
	This represents a reduction of 3 days a 10% improvement								This represents a reduction of 162 miles per year a 43% improvement

Future state spaghetti map diagram of a quality lab testing procedure. We analyze this quite thoroughly and thought of maybe this could be improved by a sequencing algorithm or perhaps U shaped cellular modification of the work area to form a lead-in lead-out arrangement. This is a classical example of how a Kaizen can be done. We simply re-arranged the test benches and computer desks, moved some of the other test equipment and shaved off 208 miles per year and 3 days. No money fun improvement! The only investment – brainpower… I really enjoyed leading these people to their own success story…



Closer look at the Future State Map.

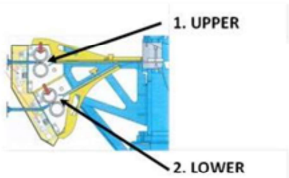
PRODUCTION LINE 0

INSTRUCTIONS:- WHENEVER THERE IS A JAM IN ANY OF THE HAMMER MILLS PUT A TALLY MARK IN THE APPROPRIATE JAM LOCATION TABLE – FOR EXAMPLE: **1A 1. UPPER** OR **3B 2. LOWER**. NEXT WRITE IN THE SAME TABLE COLUMN FOR THE HAMMER MILL THE **PULP FEED SPEED** – FOR EXAMPLE: **2.5** NEXT WRITE IN THE SAME TABLE COLUMN FOR THE HAMMER MILL DID THE JAM HAPPEN **AT ROLL CHANGE Y/N** – FOR EXAMPLE **Y**

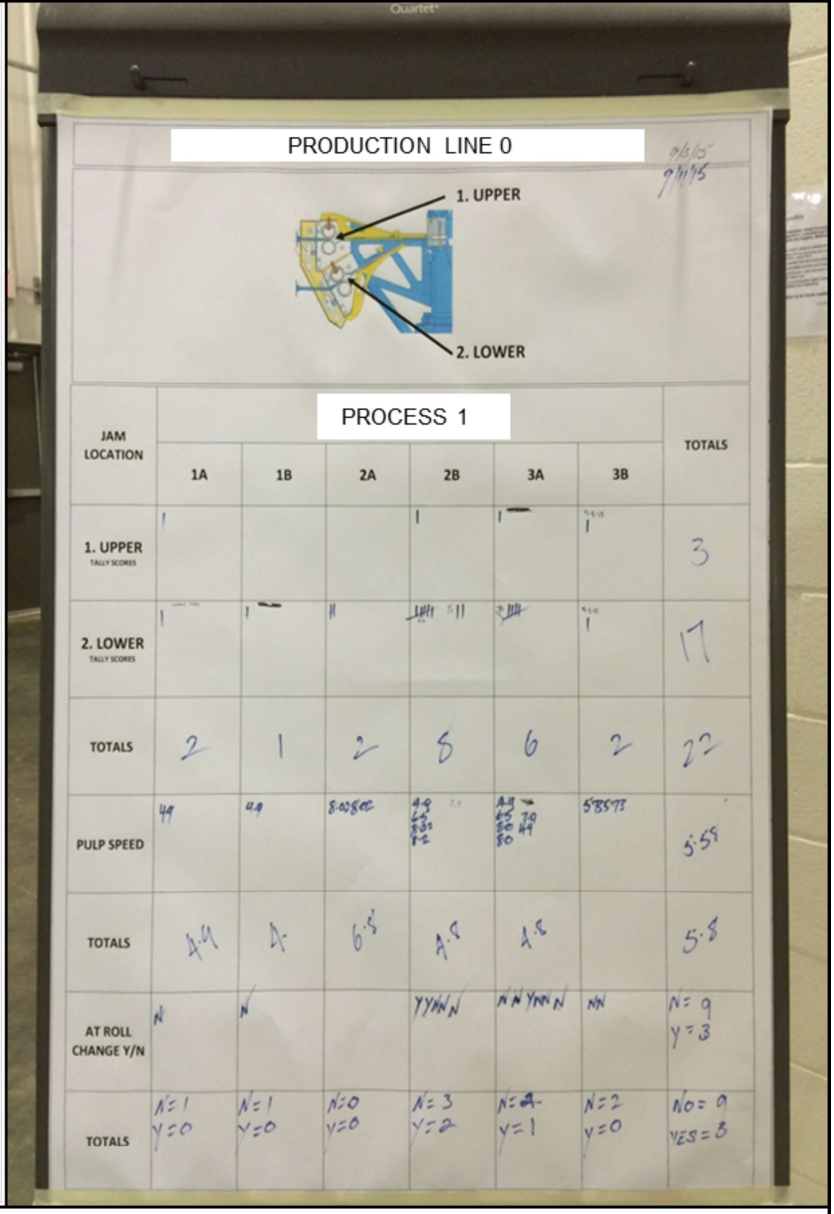
CONTINUE TALLYING THE HAMMER MILL JAMS IN GROUPS OF 5 WITH THE 5TH OCCURRENCE BEING A STRIKETHROUGH – FOR EXAMPLE 𝍸 ALONG WITH THE HAMMER MILL JAM LOCATION – PULP FEED SPEED AND AT ROLL CHANGE Y/N FOR EACH AND EVERY JAM.

AT THIS POINT IN THE DATA COLLECTION IT IS NOT NECESSARY TO WRITE ANY OTHER INFORMATION SUCH AS TIME, DATE, SHIFT ETC., THANK YOU FOR YOU HELP.

READ ⬆



JAM LOCATION	HAMMER MILL NUMBERS						TOTALS
	1A	1B	2A	2B	3A	3B	
1. UPPER TALLY SCORES							
2. LOWER TALLY SCORES							
TOTALS							
PULP FEED SPEED							
TOTALS							
AT ROLL CHANGE Y/N							
TOTALS							



In this Kaizen there were unexplained machine jams and as with any problem the first thing to is get some information and data on the situation. In this case I used a Check Sheet to populate the types of failures to buckets of where they were happening to build a visual picture of their occurrence. I constructed this Check Sheet plotted it out on a 36” X 48” piece of paper and attached it to a flip chart easel next to the machine process in question. I asked the machine operators if they would fill out this at each occurrence of the failures using tally marks. This helps get some initial information on the scope of the problem.

Object of Kaizen Event:

* To determine the phenomena affecting availability performance standards of the Line 6 Hammer Mills
* Learn the process
* Understand the problem - what is wrong with what
* Determine and verify root causes
* Verify permanent corrective actions for the problem that will resolve problem for us and for the customer
* Define and Implement Corrective Actions
* Prevent re-currence
* Congratulate the team - what did we learn

Step 1: State the Problem

Problem Statement: *The Pulp Roll Sheet Sometimes Stops Feeding into the Hammer Mill*

CFL Number If Applicable

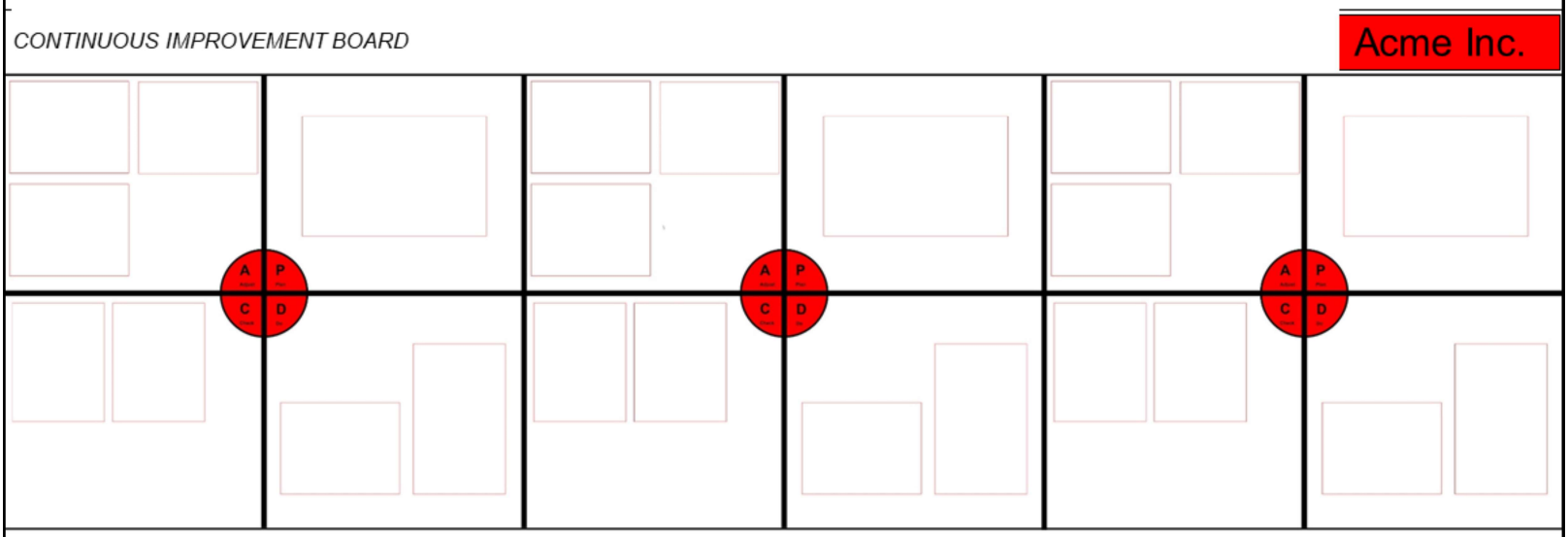
Not applicable

Size	Impact
Between August 17th and August 24th the Hammer Mills have contributed to 14 hours of unplanned downtime because of the above problem statement equaling 16% of the total for all unplanned downtime for Line 6 (equipment related) Affect availability of the asset and downstream processes. This has been a problem since line start up.	☐ Safety: (right click, select edit text) ☐ Cost: (right click, select edit text) ☐ Customer: quality issue ☑ Other: (right click, select edit text)

Step 2: Understand the Problem

WHAT	IS	Could Be, But IS NOT	between the IS and the IS NOT?	What has changed?
The pulp roll sheet and the problem is observed	is after the nips rolls of the Hammer Mills at a distance of 125 to 155 mm after the nip rolls.	immediately upstream or downstream of the Hammer Mill itself.	This is the point at which the pulp roll sheet is metered has limited degrees of freedom into closer fits in guides rolls and tooling plates to feed it into the Hammer Mill funnel system	
The pulp roll sheet and the problem is observed	recorded at occurring at the lower nip rolls for all Hammer Mills 96% of the problem statement	at the upper nip rolls mart of the occurrences	to be determined - OEM is retrofitting the feed funnel system on all lower feeds - it's possible the the acute angle (less than 90°) that the pulp roll sheet has to articulate is more that the inherent material has strength to feed straight.	
Material alignment	is alignment of the pulp roll sheet from just after nip rolls in the lateral plane with the feed funnel or alignment of the lateral plane of the pulp roll sheet that are stacked on top of each other	alignment in parallel plan of the material	There is no evidence that the material sheets are separating in the parallel plan alignment.	No change.
Material quality.	is related to material should the material not matching specified density, width, thickness, edge or surface quality.	is not related to quality of the pulp roll sheet.	Tests and samples have been taken and analysis and meet requirements.	There has been no change in materials specifications.
Machine related.	is related to machine performance and correct setting and adjustment.	Not related to the actual Hammer Mill grinding action.	The problem occurs before the Hammer Mill grinding action.	There have not been any design changes or changes in the location of the problem
WHERE	**IS**	**Could Be, But IS NOT**	**What is different between the IS and IS NOT?**	**What has changed?**
Mostly on the lower feed funnel on Hammer Mills 1B 3A	occurring on the lower feed funnel	on the upper feed funnel for mart of the time. 98% of the problem statement occurs at the lower feed funnels	the angle of the feed to align the pulp roll sheet to the inlet of the Hammer Mill	

I was experimenting with different methods and types of problem solving processes and this was one that I used which was close to the 8D problem solving method. After 25 years of problem solving I've been on the lookout for one universal tool to fit all, but one doesn't exist. My conclusion; it all depends on the problem at hand. Just like different fire extinguishers have to be used for different fires, I have found out the same if true of problems…



My design of a 4 feet X 12 feet Kaizen Report Board. It's very important to stress the PDCA management iteration in every thing you do – remember: Plans are useless; planning in invaluable…

We all do a good job on the Planning and Doing, but not so good on the Checking and Adjusting. They are have the same weight. The Check and Adjusting is crucial to the closed loop of the Deming Cycle…

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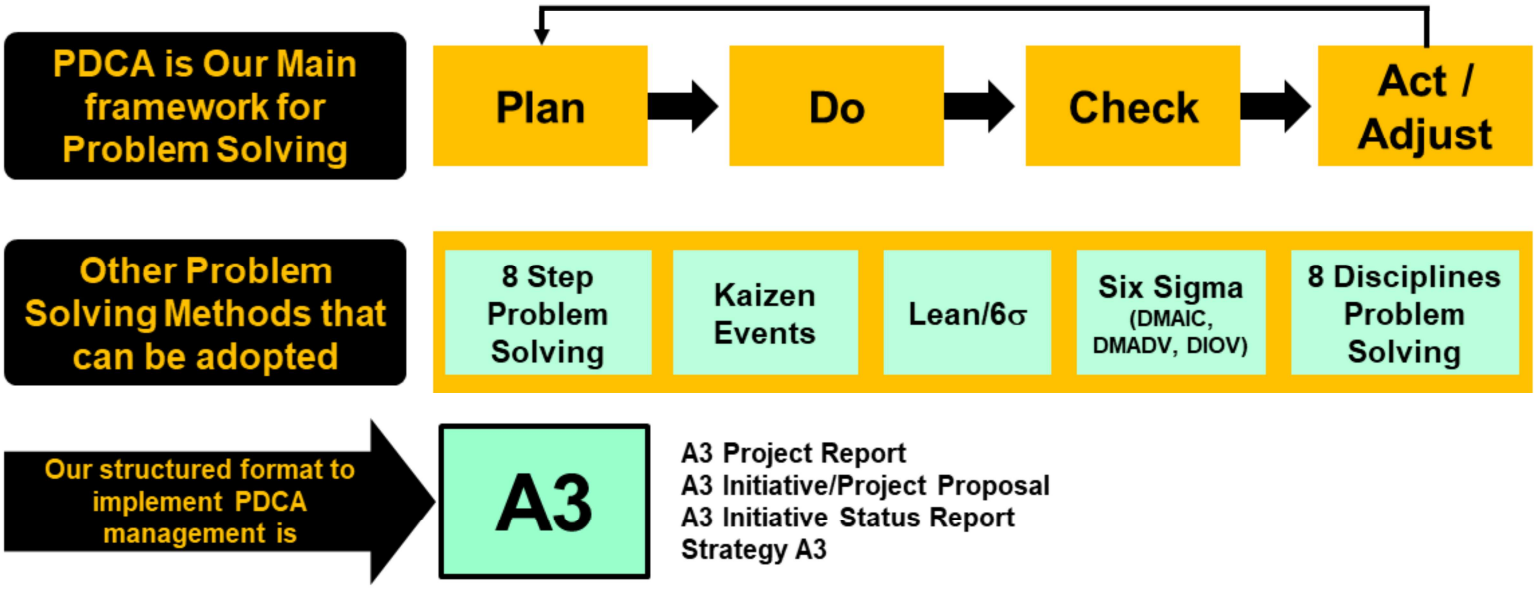
Problem Solving Approach



Problem Solving Tools to use for PDCA or any other method

PLAN

- VOC/VOB Analysis
- Process Mapping
- SIPOC Diagram
- Pareto Analysis
- Data Collection Plan
- Measurement System Analysis
- Cause and Effect Matrix
- Fishbone Diagram
- 5 Whys
- Statistical Sampling
- Control Charts
- Histograms
- Test of Hypothesis
- Process Capability Analysis
- Takt Time / Cycle Time Analysis
- Spaghetti Diagram

DO

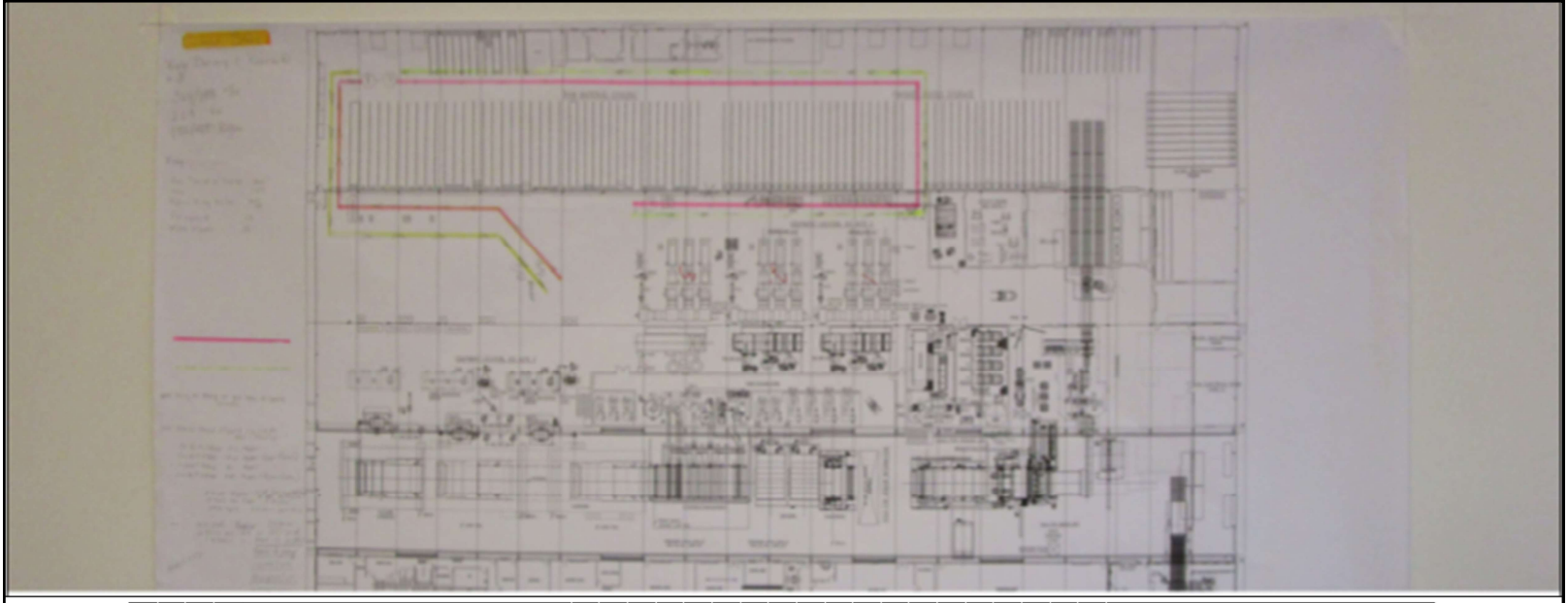
- Solution Selection Matrix
- Line Process Balancing
- Kanban Systems
- Design of Experimental
- Gantt Charts
- SMED (Quick Changeover)
- Piloting / Simulation
- Poka Yoke
- Five S

CHECK & ACT/ADJUST

- Process Control Plan
- Standard Operating Procedures
- Visual Controls
- Statistical Process Controls
- Workplace Organization
- Visual Boards
- Gemba Walk
- Training
- Recognition System

This is my model of the PDCA process. ACT / ADJUST are interchangeable depending on the situation under study…

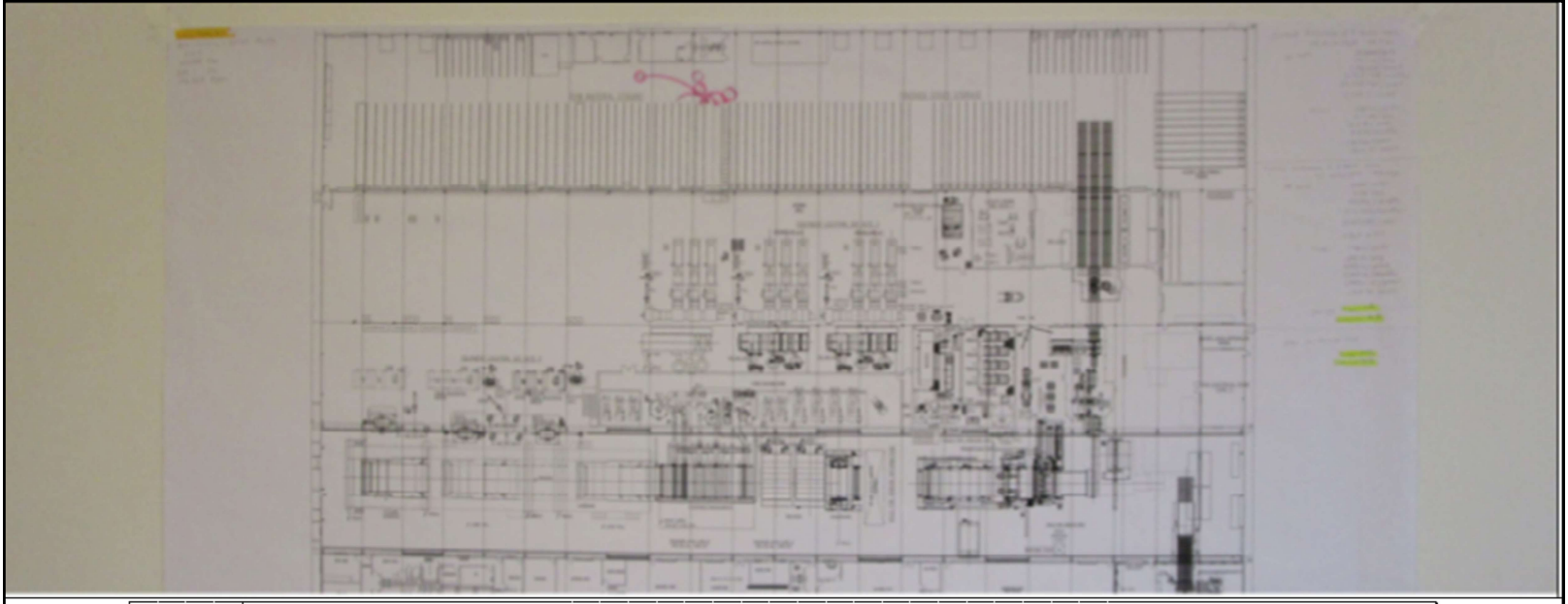
Yours truly leading a 5 days Kaizen event on value stream mapping raw material flow. Getting and keeping people engaged is paramount…



JOB TASK:	Delivery of raw materials to shop floor		
APRAISER:	Jane and Jon Doe	DATE :	04 / 12 / 17
OPERATOR:		STATE :	Current
LOCATION:	Production 1 Machine 1		

TASK STEP NO.	TASK DISCRIPTION	MAN TASK TIME H	MAN TASK TIME M	MAN TASK TIME S	TASK DISTANCE FEET	AUTO TASK TIME H	AUTO TASK TIME M	AUTO TASK TIME S	NOTES
05	Minutes per year		2,081		29,038,444				Feet per year
06	Hours per year		159		5,499				Miles per year

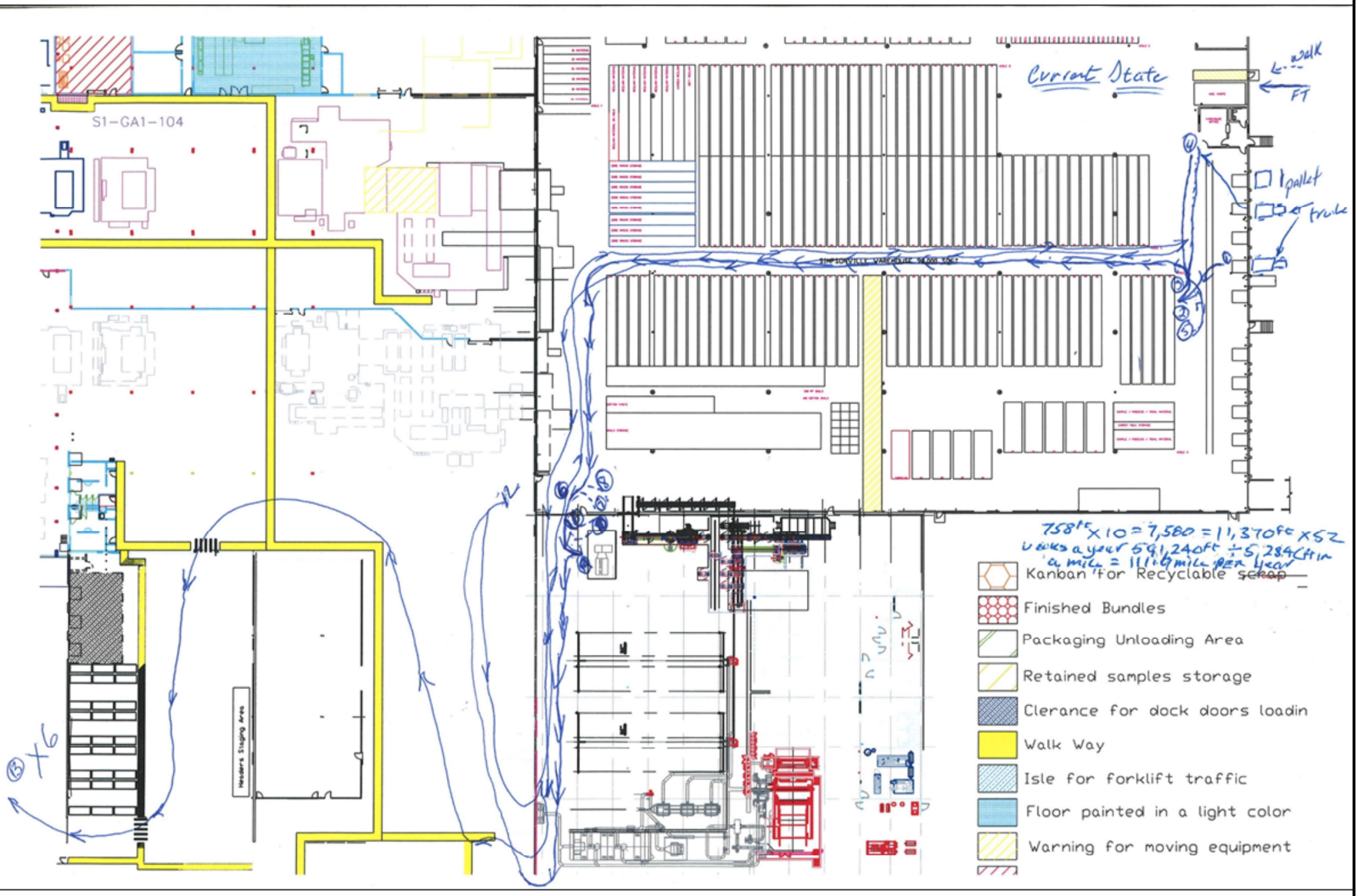
This was the Current State Map of taking raw bales materials from warehouse location to the side line storage location. Extrapolated distance per year 6,000 miles. That's a lot of miles!



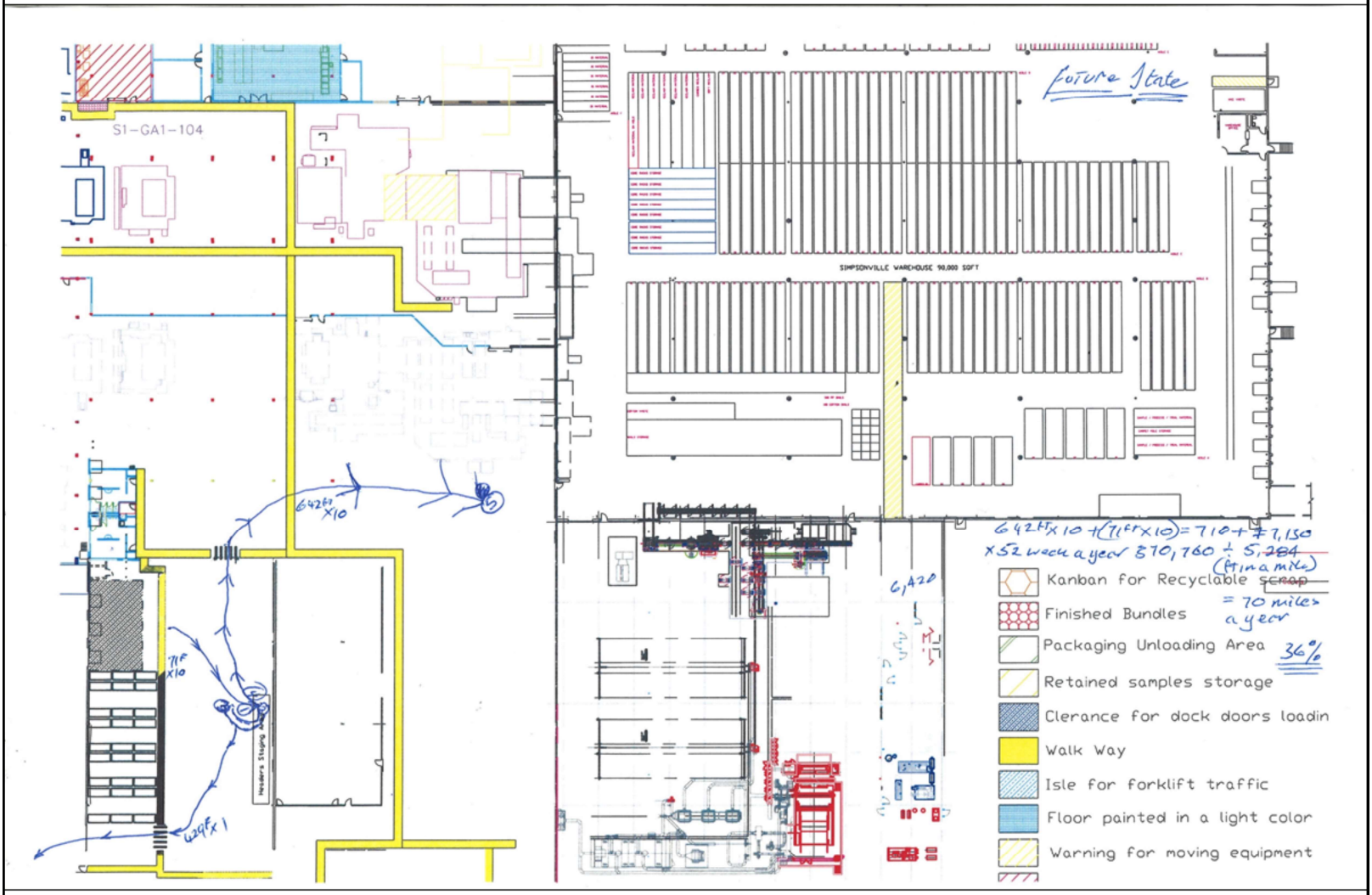
JOB TASK:	Delivery of raw materials to shop floor		
APRAISER:	Jane and Jon Doe	DATE :	04 / 12 / 17
OPERATOR:		STATE :	Future 1 Option 1
LOCATION:	Production 1 Machine 1		

TASK STEP NO.	TASK DISCRIPTION	MAN TASK TIME H	MAN TASK TIME M	MAN TASK TIME S	TASK DISTANCE FEET	AUTO TASK TIME H	AUTO TASK TIME M	AUTO TASK TIME S	NOTES
05	Minutes per year	1,085			2,568,384				Feet per year
06	1,808 Hours per year This representas a 6% reduction in time		1,808		486				486 Miles per year This represents a 92% reduction if all Kaizens are made per future state - see Materials Flow Kaizen A3 action tasks

This was the Future State Map of taking raw bales materials from warehouse location to the side line storage location. Extrapolated distance per year 400 miles. This does involve the capital project of installing a gravity feed conveyor through the partition wall to the pick point line side storage potentially resulting in a 92% reduction in distance.



This is a Kaizen warehouse raw materials for header receiving Current State spaghetti diagram. Calculated distance here was the equivalent of driving a fork lift truck from Greenville, SC to Columbia, SC and back some a year…!



This is a Kaizen warehouse raw materials for header receiving Future State spaghetti diagram. Calculated distance here was the equivalent of driving a fork lift truck from Greenville, SC to Columbia, SC and back some a year…! We simply changed the receiving dock location to the other side of the plant and change the warehouse storage location of the header. 36% reduction in distance traveled. Fork lift truck wear, time etc. etc. savings…