College of Engineering
LAMAR UNIVERSITY

KSB SupremeServ
By Standard Alloys

KSB Standard Alloys

What is Standard Alloys?

The Standard Alloys foundry, part of KSB SupremeServ, has been in business since 1926. Standard Alloys produces made-to-order parts for pumps used in oil and gas, chemical processing, utility, and related industries. The company specialty is their ability to reverse engineer pumps by any OEM from and create replacement parts which meet or exceed the original form, fit, and function. Critical to this mission is the ability of the foundry to produce one-off castings in a wide range of alloys. This report explores the current state of the foundry process for producing stainless steel impellers, one of the more common part families cast. The report documents the current state of the impeller casting process, conducts a data analysis of the process times, and offers ideas to improve ergonomics, standardization, and flow of the process.

Process Steps

Process Step	Estimated Times (Hours)		
	Min	Most Likely	Max
1. Model Release and Scheduling	0.25	0.5	0.5
2. Mold Design	3	4	8
3. Print Prep (Program Batch)	0.25	0.25	0.5
4. Print Prep (Printer)	0.5	0.5	1
5.Print	4	8	19
6. Extract and Sort Cores	1	2	4
7. Clean and Paint Cores	0.5	1	2
8.Bake Cores	0.25	0.3	0.5
9. Core Assembly	0.5	0.5	1
10. Assemble Mold Box	1	1	2
11. Flip Mold and Add Pouring Box	0.25	0.25	0.5
12.Pull Metal and Load Furnace	0.5	1	2
13. Melt	1.5	2	3
14. Sample and Add	0.25	0.25	0.5
15. Heat to Pour Temp	0.25	0.25	0.5
16. Pour	0.1	0.25	0.25
17. Shakeout	0.25	0.5	1
18. Initial Sandblast	0.5	0.75	1
19. Cutoff and Grind	4	5	8
20. Heat Treat	10	20	24
21. Sandblast	0.25	0.5	1
22. Final Inspection	0.25	0.5	0.5
23. Hardness Check	0.1	0.1	0.2

Process Improvements

•Swap core cleaning and baking oven positions to avoid forklift backtracking through restricted areas; downside is added electrician and plumbing costs.

•Provide sturdy worktables at proper heights for cleaning cores, designed to resist forklift bumps and facilitate easier pallet loading/unloading.

•Use appropriately sized turntables so workers can rotate cores without moving, allowing standardized tool positions and hose setups.

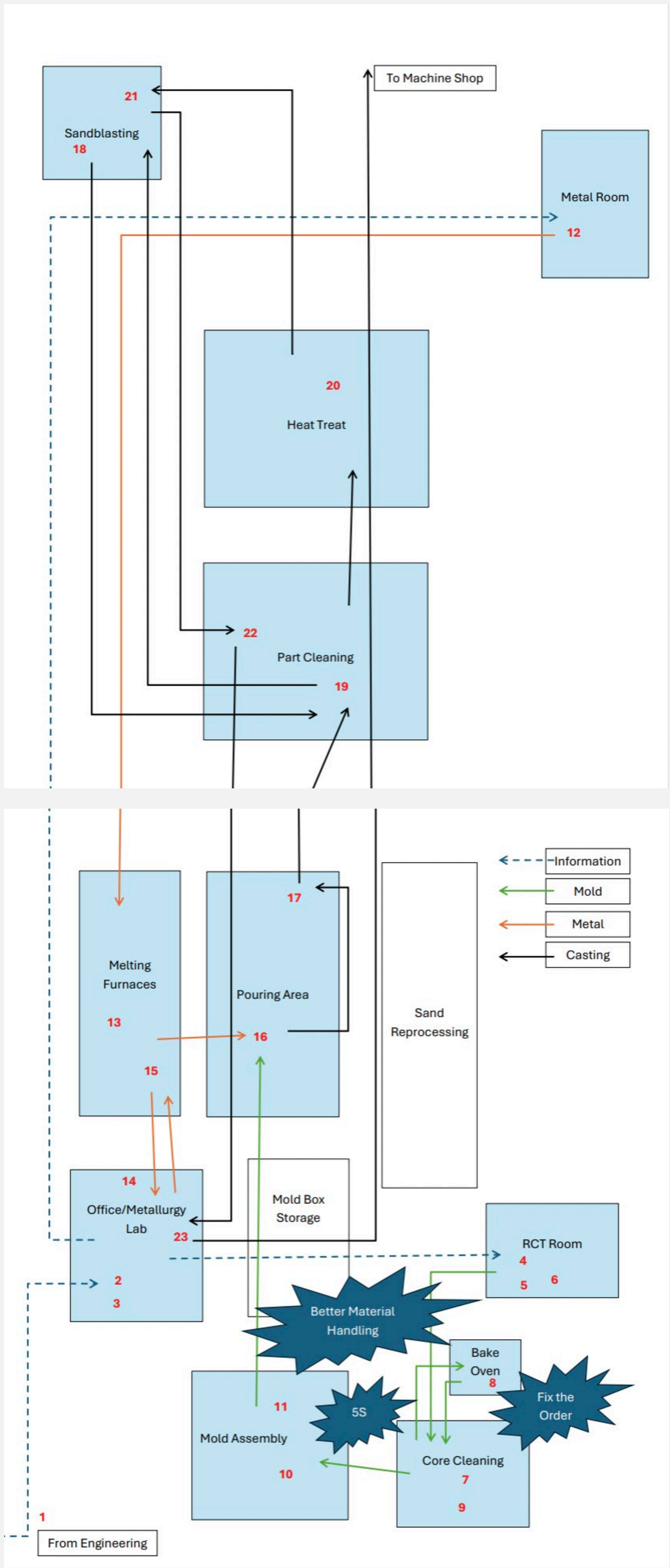
•Design future foundries with flat, level floors to eliminate trip hazards and allow use of pallet jacks, dollies, and flexible equipment layouts.

•Install a continuous bridge crane track from the RCT machine through to heat treat to enable seamless material handling throughout the process.

•Plan forklift routes in the new foundry with enough space to avoid tight turns, three-point turns, and wide swings, improving safety and efficiency.

•Optimize sightlines and mark lanes for forklifts clearly with tape or paint, reducing the need for mirrors and improving traffic flow.

Foundry Process Map



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