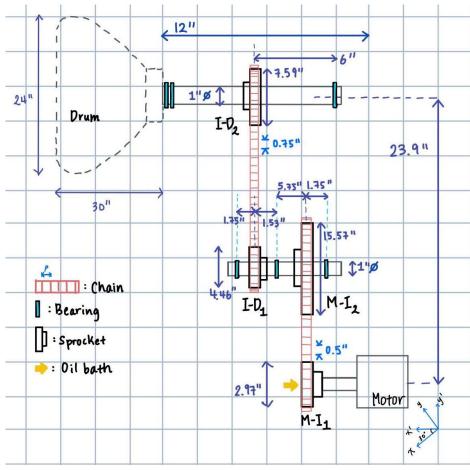
## **CHAIN DRIVE SYSTEM**





Parts Cost = \$344.69 Lubrication Cost = \$400 Maintenance Cost = \$230.80

Lifetime: 15,000 hrs

**Performance Metric = \$975.49** 

- Two ANSI roller chains of No. 41 and 60.
- 17:96 (1:5.65) ratio for 1<sup>st</sup> chain
- 17:30 (1:1.76) ratio for 2<sup>nd</sup> chain
- Total Reduction of 1:9.95
- Oil bath lubrication for 1<sup>st</sup> chain and manual lubrication for 2<sup>nd</sup> chain

## **Key Assumptions**

- Roller chains are not as loud as the candy
- Intermediate shaft will not affect loading conditions
- Chordal speed variations are negligible for 17 tooth sprockets or higher
- A 0.33% difference from desired speed is acceptable

## **CALCULATED VALUES**

Design Parameters		
Required Reduction	1:10	Motor speed of 1200 RPM is reduced 120 RPM
Service Factor	1.3	Electric Motor with moderate load
Nominal Horse Power	1 hp	Given as motor specs
Power Values		
Design Power	3.25 hp	Equation 17 - 38
Tabulated Power (Chain 1)	3.29 hp	Table 17 - 20
Tabulated Power (Chain 2)	4.54 hp	Table 17 - 20
Safety Factors		
Chain 1	2.53	$n_{fs} = \frac{K_1 K_2 H_{tab}}{H_{nom} K_s}$
Chain 2	3.49	$n_{fs} = \frac{K_1 K_2 H_{tab}}{H_{nom} K_s}$
Lubrication Types and Chain No.		
Chain 1	Type B (No. 41)	Table 17 – 20
Chain 2	Type A (No.60)	Table 17 - 20
Reliability Factor (Kr) Values		
Chain 1	3.4	Equation 17 - 33 notes
Chain 2	17	Equation 17 - 33 notes