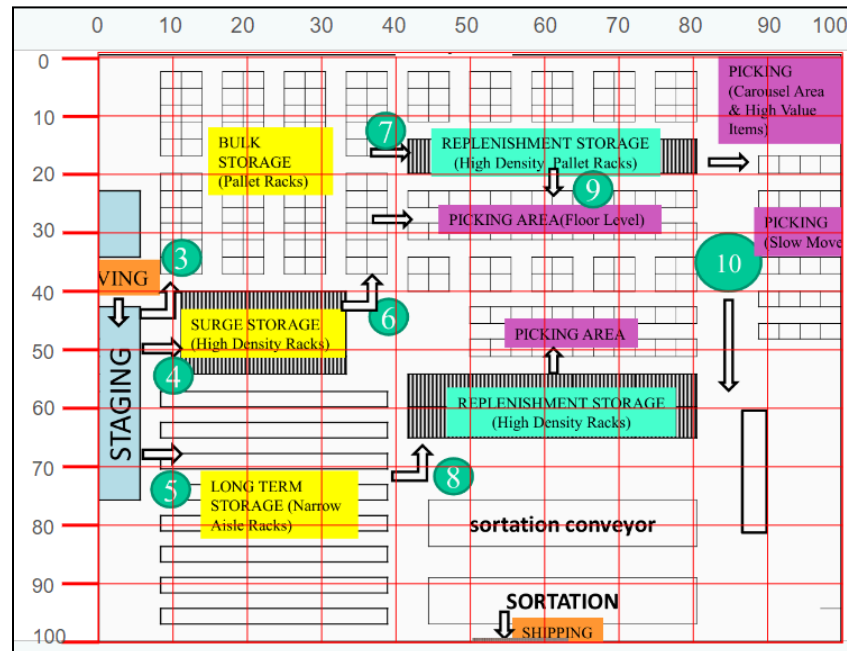


## SOM 624 Assignment 1

### Group 4

The Retail distribution center is divided in the grids for calculating the distance between each section. Below is the picture of the grid view



### Assumptions:

- The distances between different sections is taken according to the grid on the image attached by considering the centre to centre distance between different sections.
- All the calculation are done for one shift (7.61 hours)
- MHE used are 1. Pallet jacks; 2. CB Lift trucks; 3. NA trucks; 4. OP trucks
- Assuming distance from the shipping area to the loading truck is 5 yard
- Assuming both pickup and drop combined takes 0.003 hrs/ occurrence for CBLT
- It is assumed that from replenishment to picking area we are sending 45 pallet by distributing it as 11 \* 3 ; 12 pallets.

### Maximum Possible round trip per vehicle :

$$\frac{3600}{(pickup\ and\ deposit * 3600) + (Travel\ time * 3600 * distance * 2)}$$

- The price of Manual Pallet truck is taken as \$ 1,000
- The price of CB Truck is taken as \$ 28,000
- The price of NA Truck is taken is \$ 31,000
- The price of OP Truck is taken as \$ 31,000

- While considering prices there is a range of price for different loads. We taken the mean of the price, so it can buy any of the type.
- The total MHE cost is **\$ 605,000**
- Q1: How many trips - No of trips/vehicle  
Q2: How far each trip - Total distance travelled ( the distance mentioned is oneway trip )  
Q3: How many vehicles - No of vehicle required

The solutions for the above questions are in the attached pic below.

Location	From	To	Total distance Travelled (yards)	Total distance Travelled (feet)	Flow rates (pallets/ hrs)	Vehicle Type	Number of Trips/vehicle	Max Possible trip/Vehicle	Number of Vehicle required	Cost of MHEs(\$)
2	Recieving	Staging	33	99	45	Pallet Jack	10	NA	3	3000
3	Staging	Bulk Storage	72	216	30	CB Lift Truck	15	16	2	56000
4	Staging	Surge R/C Storage	32	96	10	CB Lift Truck	10	35	1	28000
5	Staging	Long Tern Storage	42	126	5	NA Truck	5	25	1	31000
6	Surge R/C Storage	Bulk Storage	30	90	10	CB Lift Truck	10	37	1	28000
7	Bulk Storage	Replenishment	40	120	40	CB Lift Truck	20	29	1	28000
8	Long Term Storage	Replenishment	50	150	5	NA Truck	5	22	1	31000
9	Replenishment	Flow rack	12	36	12	Rider OP Truck	12	NA	3	93000
	Replenishment	Carosels	37	111	11	Rider OP Truck	11	NA	3	93000
	Replenishment	Slow Units	42	126	11	Rider OP Truck	11	NA	3	93000
	Replenishment	High Value	17	51	11	Rider OP Truck	11	NA	3	93000
	Merge Area	Sortation	20	60	45	Conveyer	NA	NA	NA	#VALUE!
	Sortation	Shipping	12	36	45	Conveyer	NA	NA	NA	#VALUE!
	Shipping	Load Truck	5	15	45	CB Lift Truck	45	150	1	28000
									<b>Total MHE cost =</b>	<b>605000</b>

All the other details are mentioned in the excel sheet.