

# 2<sup>ND</sup> ANNUAL REFRIGERATION CONFERENCE 2018

Cold Store Construction Outlines



# COLD STORE CONSTRUCTION OUTLINES

## CHALLENGES FACED WHEN DEALING WITH EDIBLE FOOD STORAGE TO THE BEST POSSIBLE CONDITIONS

### Challenge levels:

1. Stakeholders in mass & whole sale storage
2. Sales outlets, Hotels & restaurants
3. Domestic use level

# COLD STORE CONSTRUCTION OUTLINES

## Mass & whole sale storage:

1. Dry storage such as
  - Storage of essential food such as Wheat, rice, sugar, grains
  - Canned food
2. Cold storage such as
  - Red meat, Sea food & Poultry
  - Fruits and Vegetables
  - Dairy products
  - Table Shell Eggs



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**Mock of a rice and Sugar store**



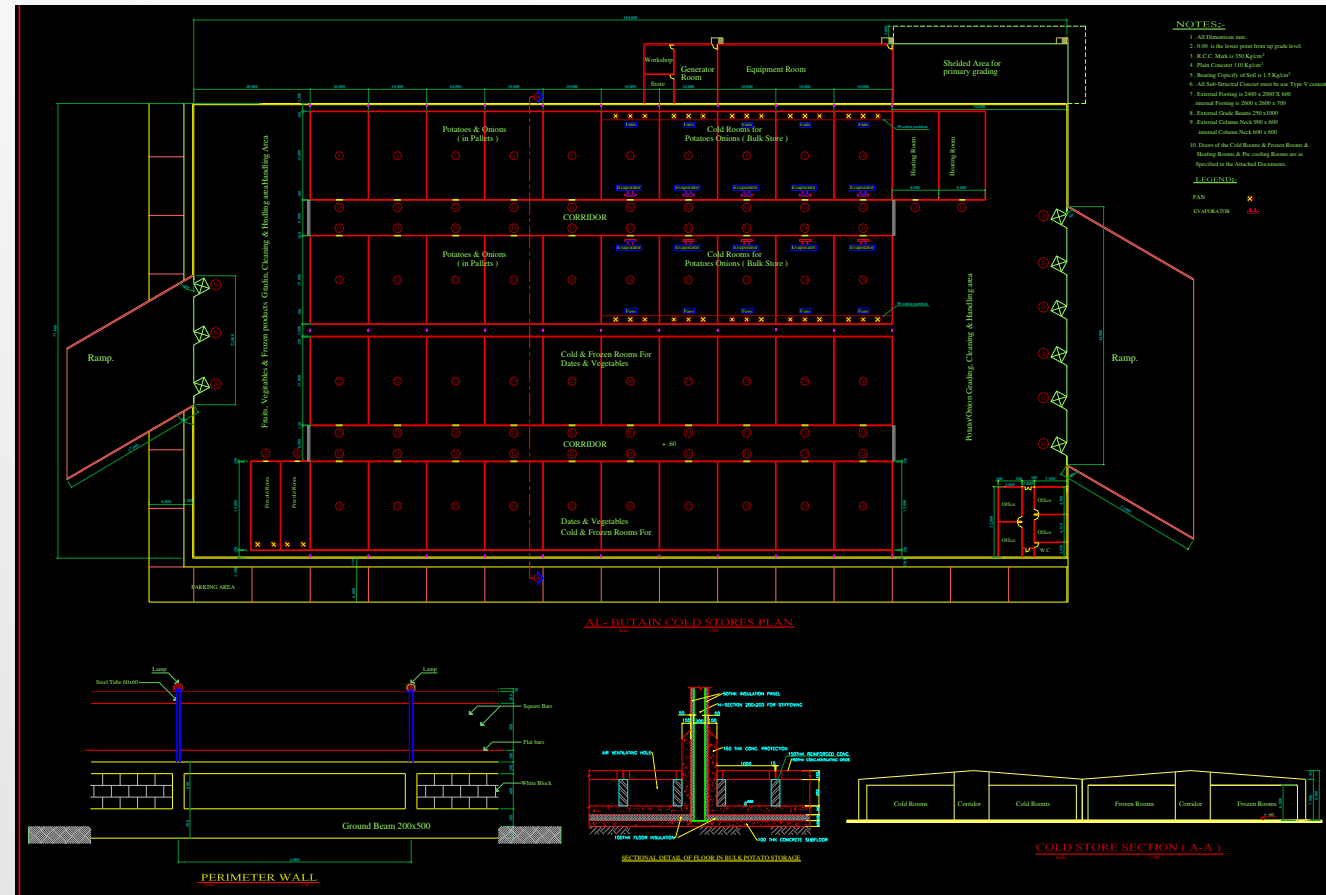
**Canned food corner  
in a Supermarket**



**Grain Silo project**

# COLD STORE CONSTRUCTION OUTLINES

## Sample multi purpose cold store



# COLD STORE CONSTRUCTION OUTLINES

## Outlines of major segments:

- 1- Project total area
- 2- The weighing station
- 3- The Docks
- 4- The building layout
- 5- The envelope
- 6- The civil works
- 7- The pallets & forklifts
- 8- The refrigeration system
- 9- Food safety in the cold store

# COLD STORE CONSTRUCTION OUTLINES

## 1. Project total area



**Nature of the activities dictates high level of Hygiene  
(External, Internal, below and above ground) &  
recycling. We deal mainly with Organic mass**

# COLD STORE CONSTRUCTION OUTLINES

## 2. The weighing station



**This photo is not from our project. No trailer was available when we took the photo, See project weighing station photo to the right side**

# COLD STORE CONSTRUCTION OUTLINES

## 3. The docks

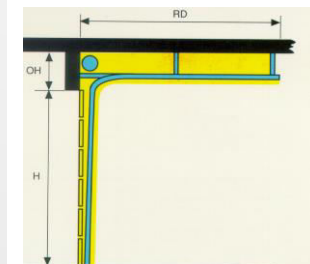
- a. The dock levelers.
- b. The dock shelters.
- c. The guides plus accessories
- d. The No. of docks
- e. Medium and small vehicles
- f. Docks' Doors



GAS TIGHT AND INSULATED DOOR



SLIDE UP DOOR



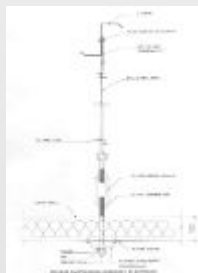
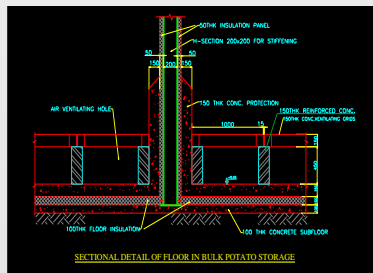
**Washing and Hygiene**  
**This area has a lot of left over**



# COLD STORE CONSTRUCTION OUTLINES

## 5. The envelope & structure

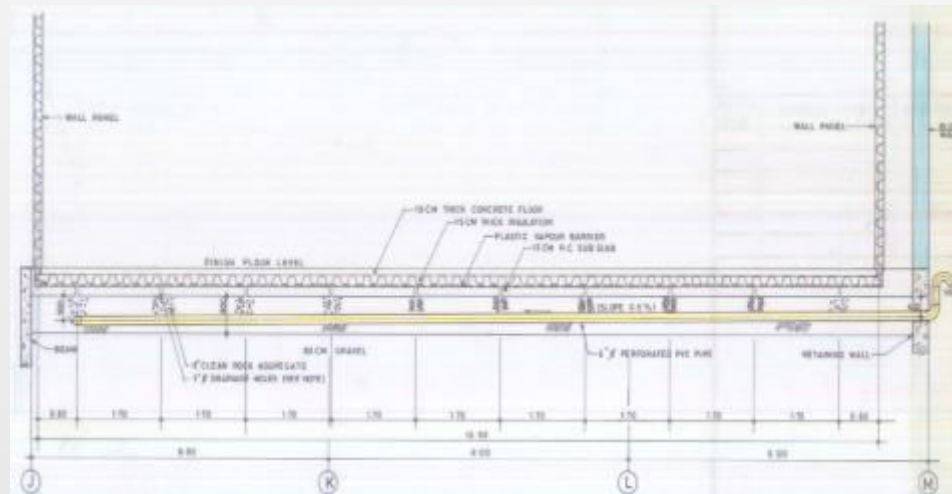
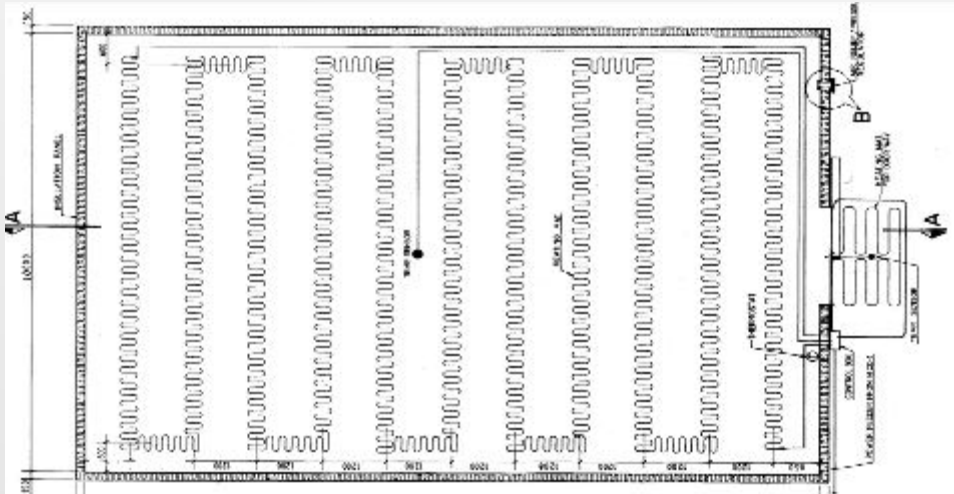
- a) The steel structure & its loads
- b) The block work
- c) The insulated envelope



# COLD STORE CONSTRUCTION OUTLINES

## 6. The civil works

- a) The floors & finishing
- b) Frost protection

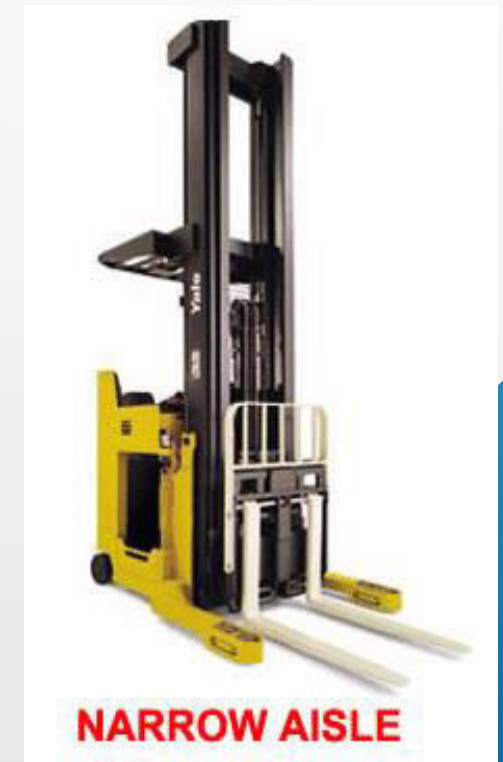
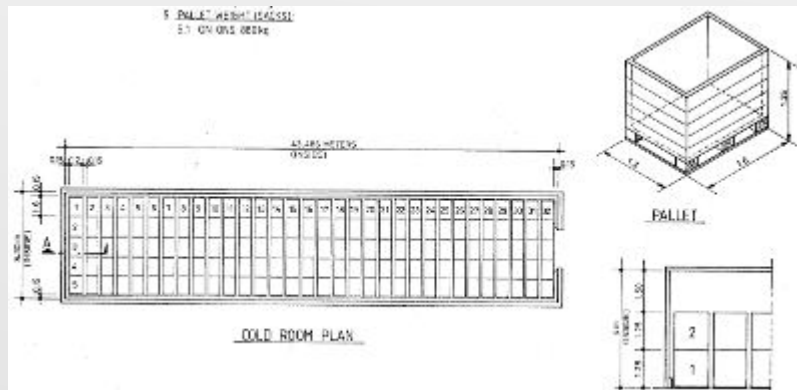


Hygiene & the rats story

# COLD STORE CONSTRUCTION OUTLINES

## 7. The Containers, Pallets & Forklifts

- a. Containers sizes Vs Pallets
- b. Pallets Vs room dimensions
- c. Room dimensions & effective utilization
- d. Forklift types (Power & sizes)



# COLD STORE CONSTRUCTION OUTLINES

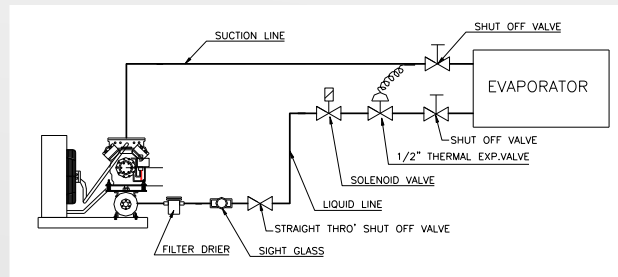
## 8. The refrigeration system

a) Which system to use

- Stand alone
- Rack system
- Centralized

b) Which refrigerant to use

c) Coolers design & construction



# COLD STORE CONSTRUCTION OUTLINES

## 9. Food safety

- a) Regular inspection
- b) Indoor equipment with food
- c) Hygiene
- d) Condensate & Drainage
- e) In house labs

### Guide lines for inspectors

1. Go where they do not expect you to go. Do not follow guided tours
2. Be armed with simple effective tools
3. Update your knowledge



# COLD STORE CONSTRUCTION OUTLINES

## CHALLENGES FACED WHEN DEALING WITH EDIBLE FOOD STORAGE TO THE BEST POSSIBLE CONDITIONS

### Sales outlets, Hotels & restaurants

#### 1. Public food courts (Restaurants)

- Sizes and variety even with large restaurants considered commercial application. Do not need a consultant (Supplier and/or contractor will do)
- Keep place and appliances clean and well ventilated. Hygiene is a necessity
- Use separate display cases for different products.
- Use either individual condensing units or pool them on a rack with common condenser and high side components
- Pay special attention to delta T and No. of fins on the low side.
- Use energy efficient compressors.

# COLD STORE CONSTRUCTION OUTLINES

## CHALLENGES FACED WHEN DEALING WITH EDIBLE FOOD STORAGE TO THE BEST POSSIBLE CONDITIONS

### Sales outlets, Hotels & restaurants

#### 1. Public food courts (Restaurants) **Cont.**

- Use environment friendly refrigerants
- For big restaurants, appoint PIC & subject him to training, education and certification. (Dealing w/public health)
- Keep proper records
- Use calibrated measuring tools.
- Have an expert examine the records and recommend required actions
- Keep track of industry & legislations advancements then apply as much as possible.

# COLD STORE CONSTRUCTION OUTLINES

## CHALLENGES FACED WHEN DEALING WITH EDIBLE FOOD STORAGE TO THE BEST POSSIBLE CONDITIONS

**Sales outlets, Hotels & restaurants**

### **2. Supermarkets and groceries**

A- For small and medium size, treat them same like restaurants.

B- Large size supermarket can be divided to the following :

- Display areas (Canned/dry food, Dairy products, fruits/ vegetables,
- Preparation areas (Meat, poultry, fish)
- Storage area (All chilled & frozen.
- Receiving and Handling area (Docks, inspection, packing, packaging)
- Possible ice production facility (Crushed, flakes, cubes etc) for the use of the supermarket only

# COLD STORE CONSTRUCTION OUTLINES

## CHALLENGES FACED WHEN DEALING WITH EDIBLE FOOD STORAGE TO THE BEST POSSIBLE CONDITIONS

**Sales outlets, Hotels & restaurants**

### **2. Supermarkets and groceries**

Requirements for each area:

- a. Display areas – Principles are the same. Do not change due to size.
- b. Preparation areas. Contain air movement. No further chilling.
- c. Storage area; Use state of the art centralized systems with BMS/DCS or SCADA plus natural refrigerants.
- d. Receiving and Handling area: Air Conditioned clean air.
- e. Possible ice production facility (Mainly for fish and sea food )

# COLD STORE CONSTRUCTION OUTLINES

## CHALLENGES FACED WHEN DEALING WITH EDIBLE FOOD STORAGE TO THE BEST POSSIBLE CONDITIONS

### Challenge levels - Domestic use level

- a. Does not require consultants
- b. It requires awareness of food safety importance & how to achieve same.
- c. Keep condensers ventilated.
- d. Keep the appliance interior air tight.
- e. Avoid frost accumulation.
- f. Keep it clean.
- g. Adjust temperature as and when need arises.
- h. Do not melt frozen products & re-freeze them again.
- i. Avoid mixing many products.

# COLD STORE CONSTRUCTION OUTLINES

Thank you

