



UNIVERSITI  
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**THE HEXA ONE**

# **WAREHOUSE DESIGN**

**GROUP 1**

# WAREHOUSE DESIGN: INTRODUCTION & OBJECTIVES

## WHY DO WE NEED A WAREHOUSE ?

The necessity of warehouses arises from their fundamental role in the storage, shipping, and distribution of goods for businesses. They constitute an essential component of the supply chain, facilitating the efficient movement of products from manufacturers to consumers.

## IMPORTANT COMPONENT OF WAREHOUSE FROM OUR POINT OF VIEW

- Optimize Space Utilization
- Improve Efficiency and Workflow
- Enhance Safety and Compliance



# COLD STORAGE: HISTORY

- TO STORE PERISHABLE GOODS AT CONTROLLED TEMPERATURE TO MAINTAIN THEIR QUALITY.
- REMAIN FRESH AND SAFE FOR USE.

## EARLY DEVELOPEMENT

- mechanical refrigeration systems were developed. (19th century)



## INDUSTRIAL EVOLUTION

- significant changes for advancements in refrigeration technology. (early 20th century)



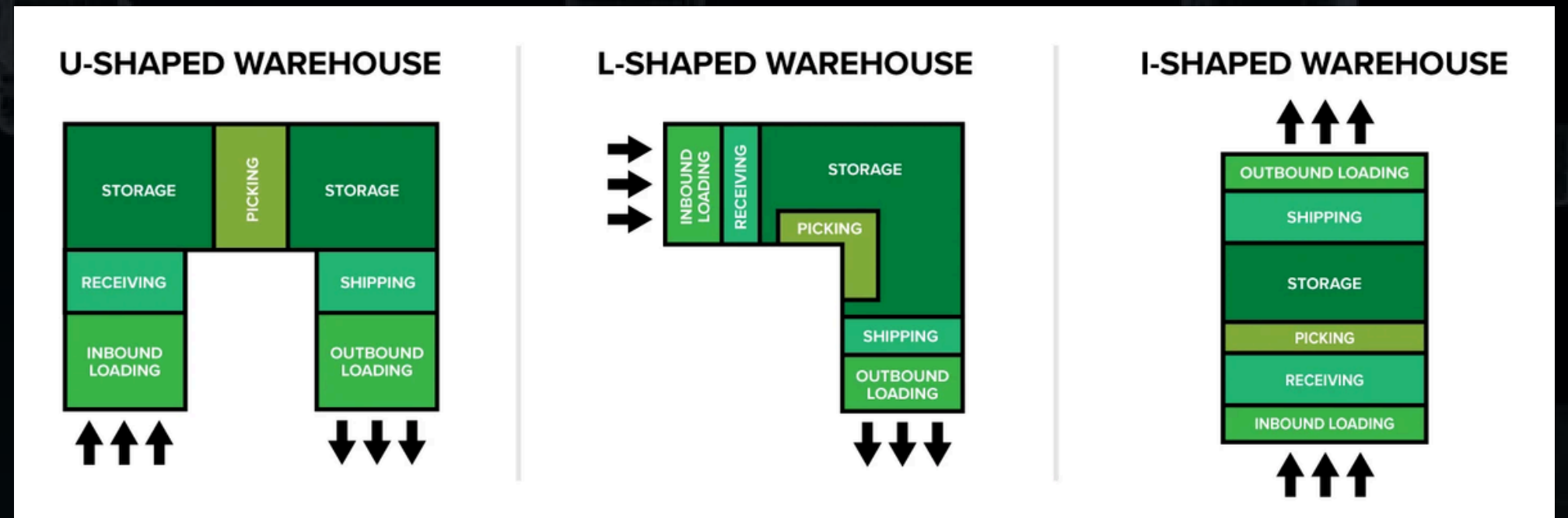
## MODERN COLD STORAGE

- chilled storage (0°C to 5° C)
- frozen storage (-18°C to -25°C)
- deep freeze (-30°C and below)



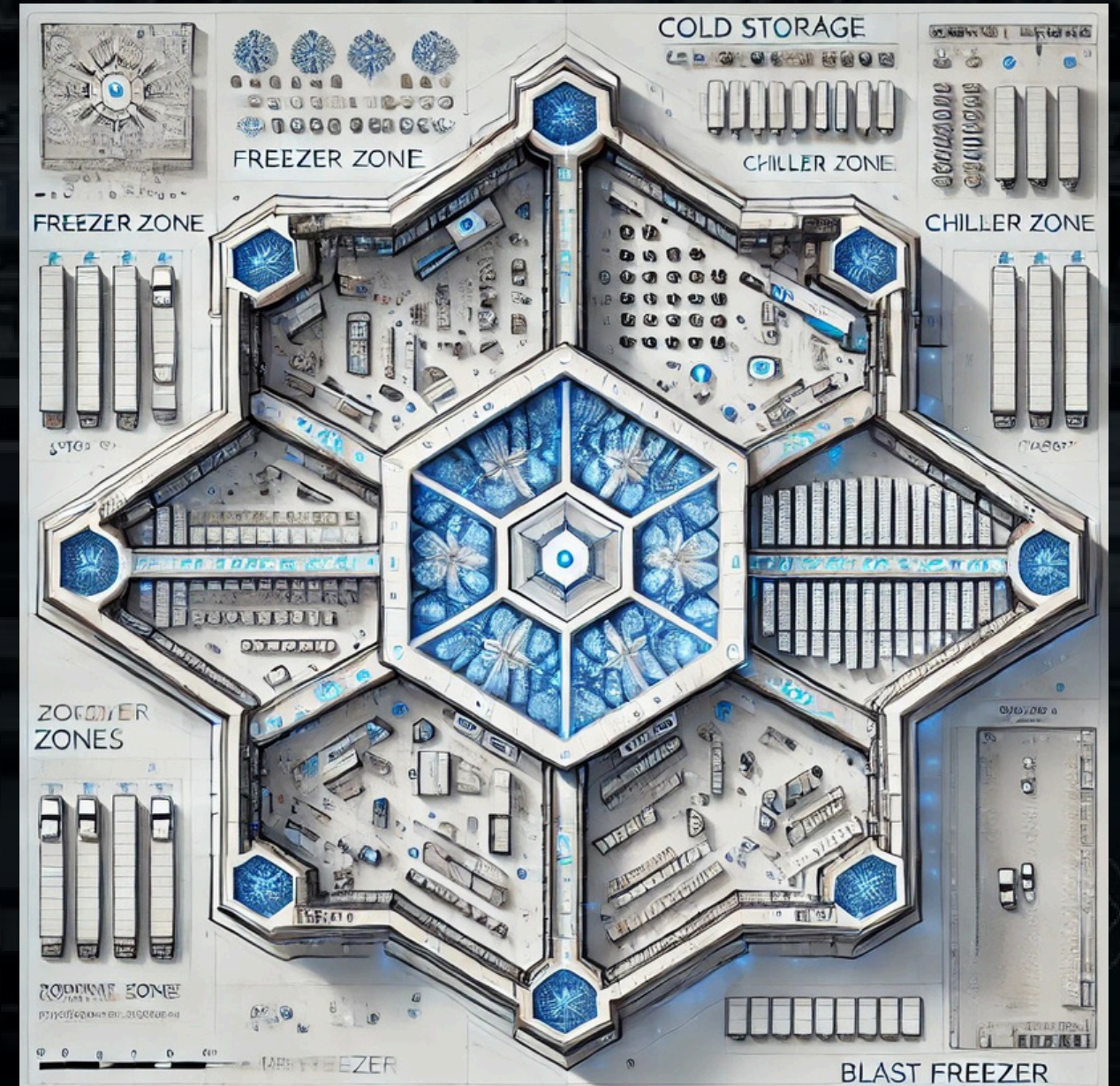
# U - LAYOUT

- HIGH OPERATIONAL AND EFFICIENCY  
-Smooth Workflow
- LOW MATERIAL COST  
- Minimizing Waste and Labor Costs



# WHY SNOWFLAKE SHAPE ?

- Optimized space utilization
- Multiple Access points for different temperatures zones
- Energy Efficiency and Sustainability
- Efficient Cold air distribution



### System in this warehouse

- Centralized air conditioner with temperature monitoring system
- Warehouse Management system, RFID
- Control Panel (In Control room)
- Rain water Harvesting system
- Microwave sensor system (AUTO ON/OFF Light)

### Stations & Rooms

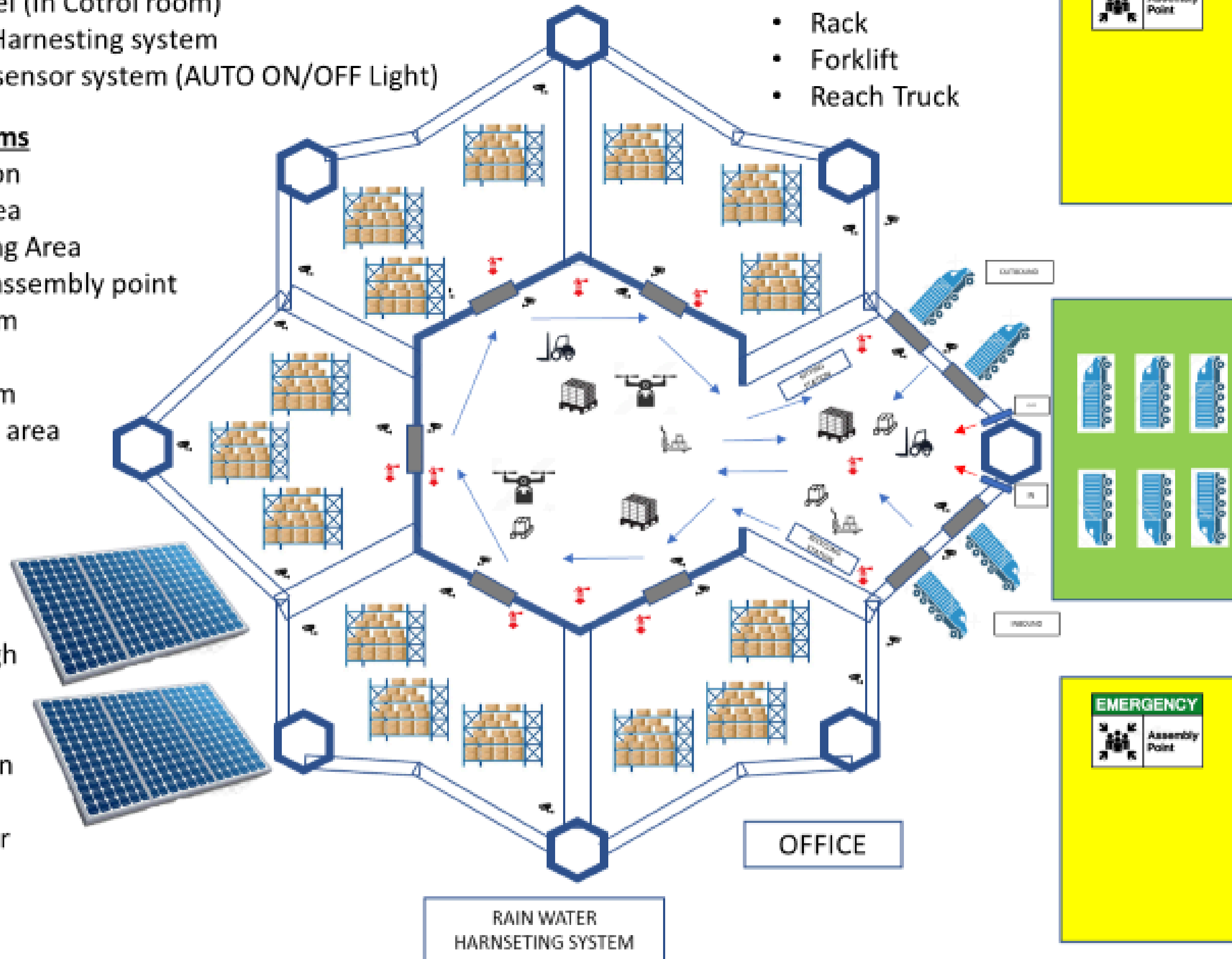
- Kitting Station
- Recycling area
- Cross Docking Area
- Emergency assembly point
- Storage Room
- Office
- Control Room
- Value added area

### Safety & Security Measure

- CCTV
- Walkthrough Metal detector
- Panic Button
- Fire extinguisher
- Water Sprinkler
- Water hose

### Equipments

- DRONES (With Heater)
- Handjack pallet
- Pallets
- Rack
- Forklift
- Reach Truck



### The Warehouse Workflow The Process



# TECHNOLOGY

## AUTOMATED STORAGE AND RETRIEVAL SYSTEMS (AS/RS)

- Improves storage density and picking efficiency.
- Reduces human errors in inventory handling.
- Enhances real-time inventory tracking.



## AUTONOMOUS MOBILE ROBOTS (AMRS)

- Automates picking and transportation of medicines within the warehouse.
- Reduces labor costs and increases operational efficiency.
- Enhances accuracy in order fulfillment.



## COLD CHAIN MONITORING SYSTEMS

- Ensures temperature-sensitive drugs remain within safe ranges.
- Uses IoT sensors to provide real-time temperature data.
- Reduces spoilage and regulatory non-compliance risks.



## AI-POWERED PREDICTIVE ANALYTICS

- Analyzes demand patterns for inventory optimization.
- Prevents stockouts and overstocking of medicines.
- Enhances supply chain decision-making.

## AI-DRIVEN AUTOMATED QUALITY CONTROL

- Uses computer vision to detect defects in packaging.
- Ensures compliance with safety and labeling standards.
- Reduces human inspection errors.

# TECHNOLOGY



# GO GREEN SUPPLY CHAIN

## Why Go Green?

Rising energy and water costs  
Growing demand for sustainable logistics  
Future-proofing against environmental regulations  
Enhancing business reputation and competitiveness

## Investment & Business Growth

Smart Investments for Long-Term Success

- Higher ROI and Long-Term Cost Savings
- Attracts Eco-Conscious Clients & Investors
- Stronger Brand Reputation

## No Paper Documentation

Digital Transformation for Smart Warehousing

- Improved Operational Efficiency
- Cost Savings on Paper & Printing
- Lower Carbon Footprint

PDA System

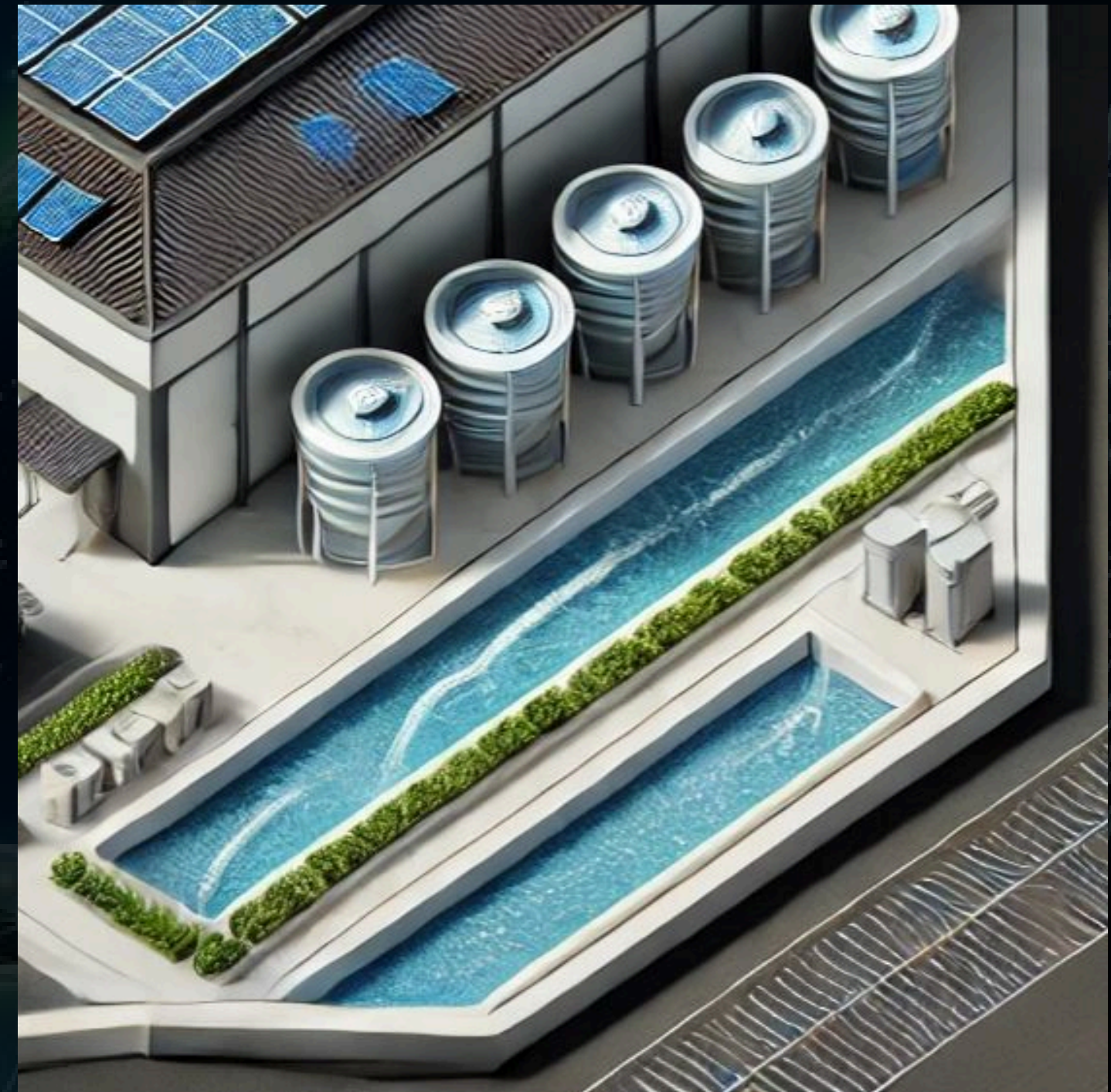


# GO GREEN SUPPLY CHAIN

## Rainwater Collection System

Sustainable Water Management

- Reduced Water Expenses
- Supports Cooling & Cleaning Operations
- Environmental Sustainability



# GO GREEN SUPPLY CHAIN

## Solar System

Harnessing Solar Energy for Cost & Efficiency

- Lower Energy Costs
- Energy Independence & Reliability
- Government Incentives & Tax Benefits



# GO GREEN SUPPLY CHAIN

## WAREHOUSE MICROWAVE SENSORS

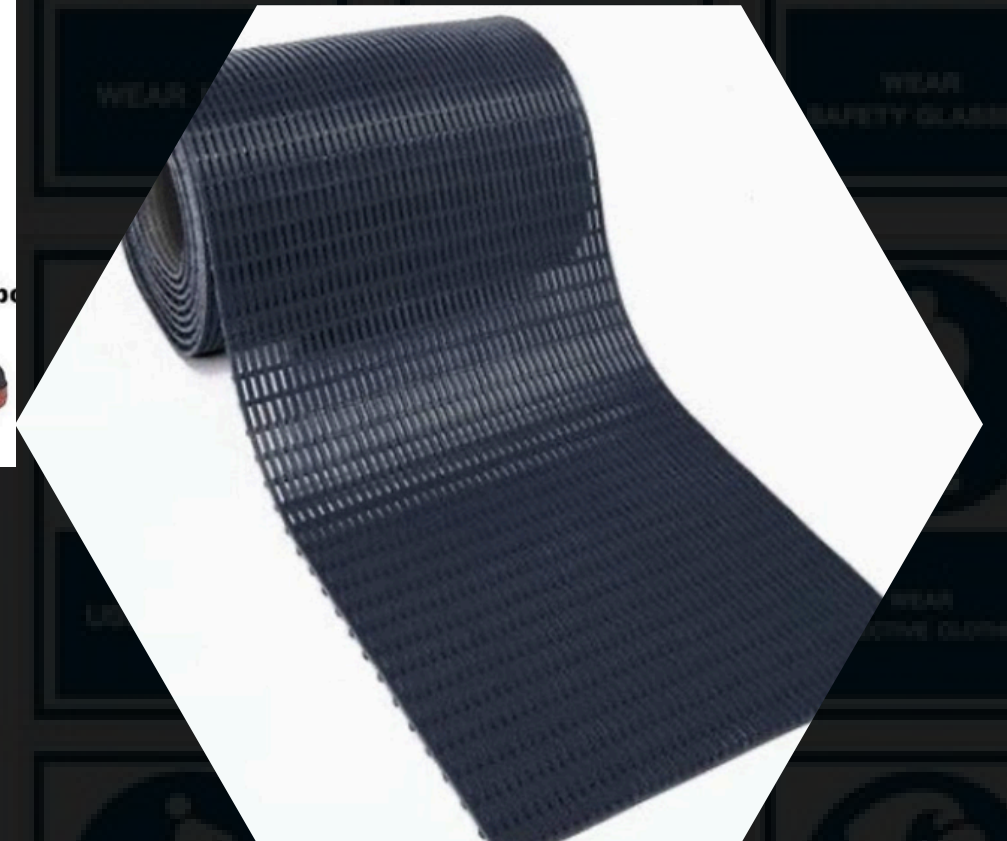
**Motion Sensor-Based : Detects movement in the cold chain room. Automatically turns on the lights when someone enters and off after a set period of inactivity.**



# SAFETY MEASURES

Top priority in cold storage facilities

- Backup power supplies
- Proper ventilation
- Slip resistant flooring
- Fire safety systems
- Emergency protocols
- Workers provided with insulated protective gears



# THANK YOU !!



**THE HEXA ONE**

**CREDITS :**

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