



## Safety Guarding

### 1. Palletizing Cell Fence



All JAE Automation guarding is reviewed with a safety engineer with respect to Ministry of Labour Regulation 851 for Industrial Establishments and CSA Standards applicable to the equipment involved in the project.



## Safety Guarding

### 2. Items to consider when designing a fence guard system around a cell

- Access to equipment inside the cell
- How much room is needed for work in process; i.e. pallets or slip sheets
- How much room is needed for specific maintenance activities
- The ability to get into the cell with a lift truck for changing out motors or heavy pieces of equipment
- Future expansion possibilities
- A review of the current plant LOTO system and how it applies to a new robot cell needs to be considered
  - Locks may not be required in the robot cell because of the safety system used, however, if other equipment in the plant requires locks and different procedures it may be confusing
- Panels in the fence and supporting columns should be placed to allow removal of panels if a large piece of equipment needs to be removed
- During installation; wire & cable runs, pneumatic pipe or tubing runs, must be considered to allow the ability to remove the above mentioned panels
- Good mechanical guard components must be selected so that after a period of time the system still maintains its mechanical integrity



## Safety Guarding

### 3. Access into a guarded cell or safety zone



JAE automation cells or safety zones will be inside guard fencing controlled by a safety system.

Entrance into the cell or safety zone will require the operator to press the "STOP" pushbutton at an entrance. The automation cell will perform a controlled stop and when it has finished, the door gate selected will unlock thereby shutting down the automation cell or particular zone for safe entry.

The automation cell or zone cannot be started with the gate open and the operator in the cell will be required to have pressed "Reset / Start" to ensure a safe exit has occurred.

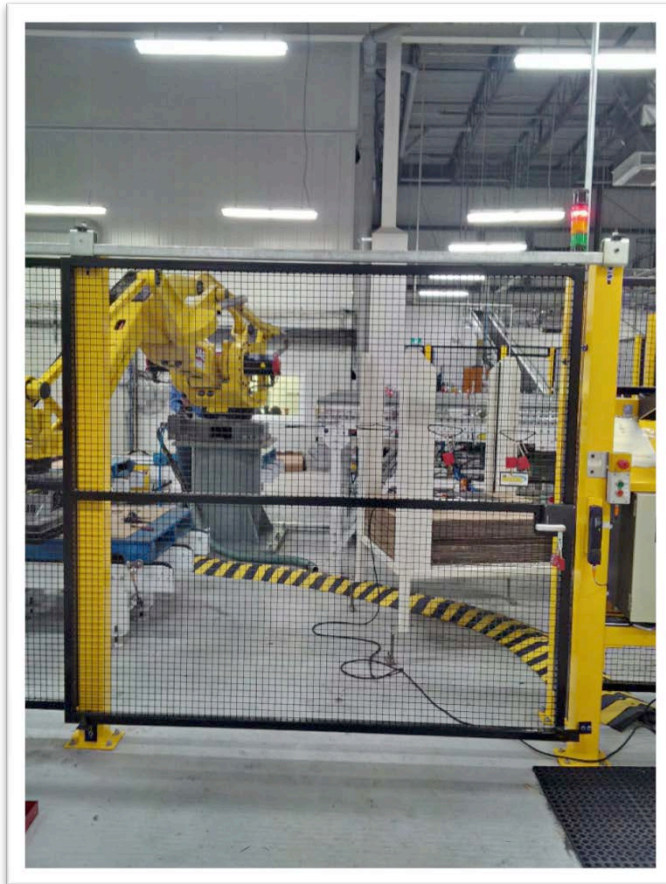
The light on the pushbutton station will turn off when the door is open, when closed and ready for a reset the light will flash, indicating a reset is needed. Once reset, the green pushbutton will turn off.





## Safety Guarding

### 4. Palletizing Cell Main Entrance



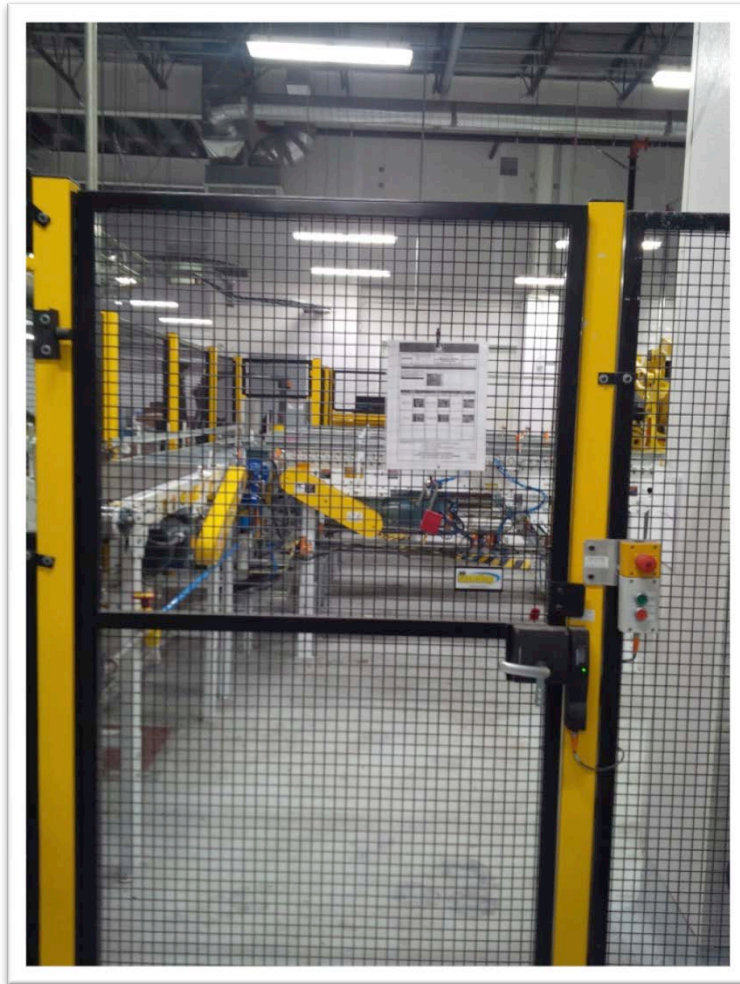
An example of a six foot slide gate. Large opening swing gates are not recommended, they get in the way during opening and tend to lose mechanical integrity over time.

When doors or gates close they need to be designed so that mechanical components aid in the locating and positioning of the door latch as it closes and aligns with a safety switch. Do not rely on the electrical safety switch to align and stop the gate or door for closing.



## Safety Guarding

### 5. Palletizing Cell Maintenance Access



A 42" wide swing door. Designed to allow a pallet cart to pass thru with a 40 x 48 pallet carrying a heavy maintenance item if required.

JAE Automation safety doors and gates utilize distributed networks such as, Ethernet or AS-I, to minimize installation time and allow for easy relocation.



## Safety Guarding

### 6. Palletizing Cell Fence Guarding with Tunnel Guard



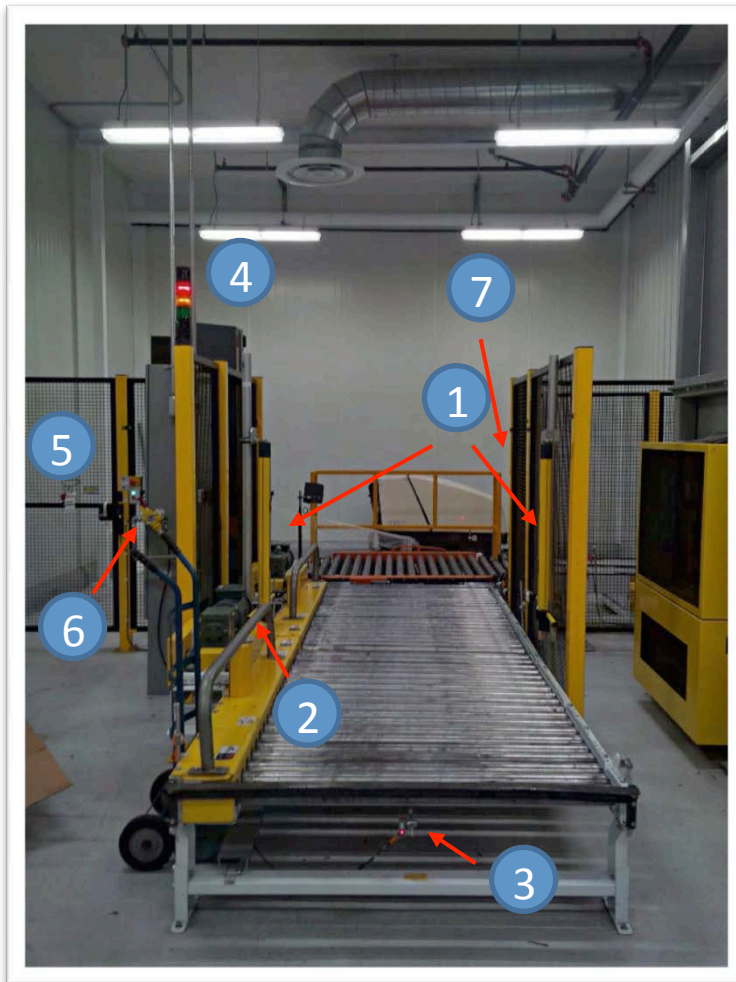
Tunnel guards are placed on conveyor exits to restrict access to openings into the cell. This prevents personnel from reaching through the opening into the cell.





## Safety Guarding

### 7. Stretch Wrapper Discharge Guarding



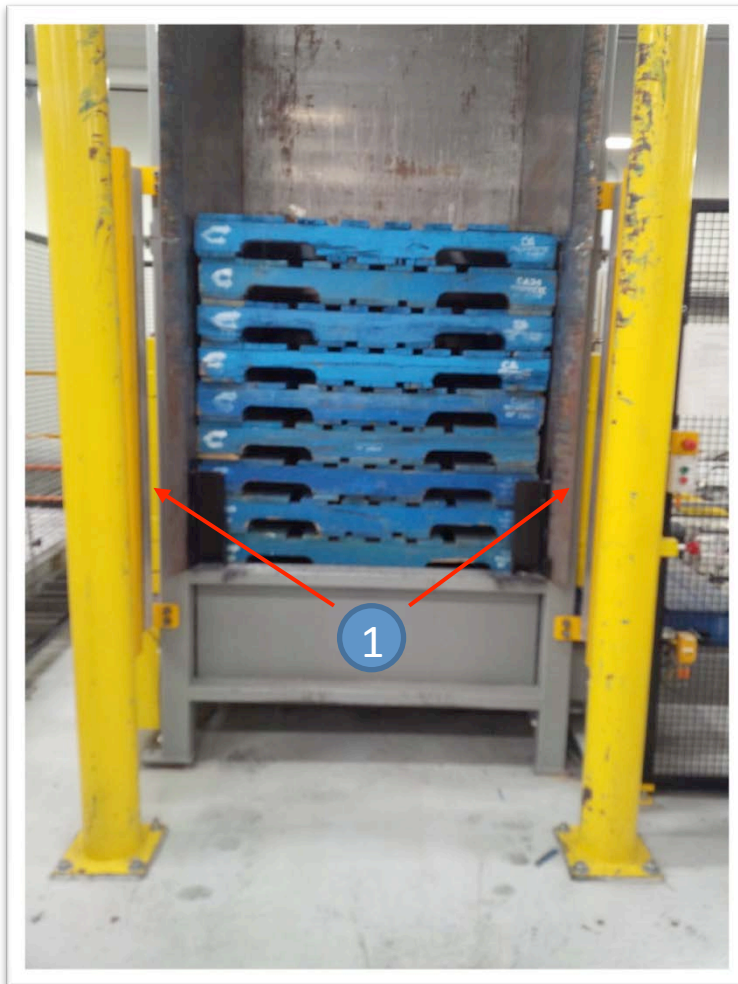
#### Safety components:

1. Light curtains control entrance to cell.
2. Barrier to prevent personnel from walking on guards.
3. Lift truck sensor, used to reset conveyor.
4. Cell status indicator.
5. Guard door access to stretch wrapper; allows safe access to wrapper for film change, while allowing the palletizing cell to continue running.
6. Manual air dump, or fully automatic with verification is available.
7. Light curtains (not shown) control access to palletizing cell from wrapper cell.



## Safety Guarding

### 8. Pallet Dispenser Light Curtain



1. Light curtain controlling movement of pallet dispenser.

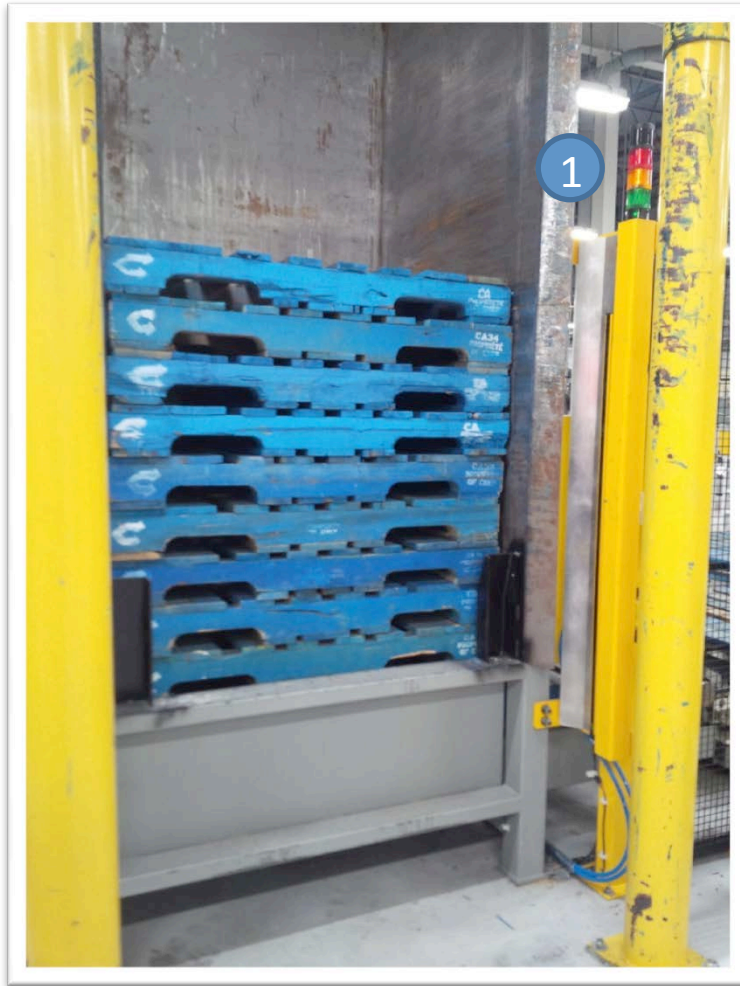
As the pallet dispenser operates, a scissor lift raises and lowers the pallets up and down and sets the pallet on a feed chain. There is a potential for injury between the frame and pallet as it lowers. The light curtain when broken disables the lift operation eliminating the hazard.





## Automation Safety Guarding

### 9. Pallet Dispenser Light Curtain Safety Status Indicator



1. Pallet dispenser and light curtain safety status indicator.

Note:

- Light curtains are installed on heavy duty anti vibration mounts.
- Large bollards to protect curtains from lift trucks.