



SEPARATING PEOPLE FROM HAZARDS

Facility Safety Solutions

Interior Fall & Impact Protection





Kee Safety: Protecting People from Falls and Impacts

Long recognized as a leader in rooftop fall protection, Kee Safety has an expanding set of solutions to protect people inside and outside the facility. Our safety experts bring decades of compliance experience to become your partner in protecting people from the most dangerous hazards on your site. Focusing on both the welfare of your people and the profitability of your operation, our tried and tested safety products are built to ensure consistent performance at the highest level.

Kee Safety: Assessing the Risks Inside your Facility

As workplace safety experts we perform critical analysis inside your facility to identify the hazards where your workers are exposed to the greatest risk. This analysis ensures that the most dangerous areas are protected immediately with proven solutions that meet recognized standards and regulations.

Our Process

Understand

- **Site Meeting:** we meet with your team to understand workflows and critical zones
- **Facility Walk-Thru:** we walk with you through the plant and inspect the hazards

Solve

- **Solution Creation:** we build a plan to apply safety solutions to your hazards
- **Professional Installation:** after your approval, we work with you to perform or oversee your installation

Maintain

- **Follow-Up Inspection:** for some products, annual inspections help to ensure continued compliance
- **Site Reassessment:** as your business processes and facility change, we will help you reassess your need for safety solutions

★ **The best solutions are found when we collaborate our safety experience with your field experience**

OSHA Compliance We Exceed the Standards

Safety and Compliance

- Exceed all current OSHA requirements
- Products tested in global compliance center

Durability

- Coated for long-lasting, dependable safety
- Corrosion-resistant, maintenance free components

Versatility

- Pre-fabricated, modular design
- Assemble or reconfigure on-site

Simplicity

- Installs easily with minimum tools
- No welding or special permits required

Customer-Focused

- Responsive regional sales team across North America
- Expertise in federal, state and local compliance codes

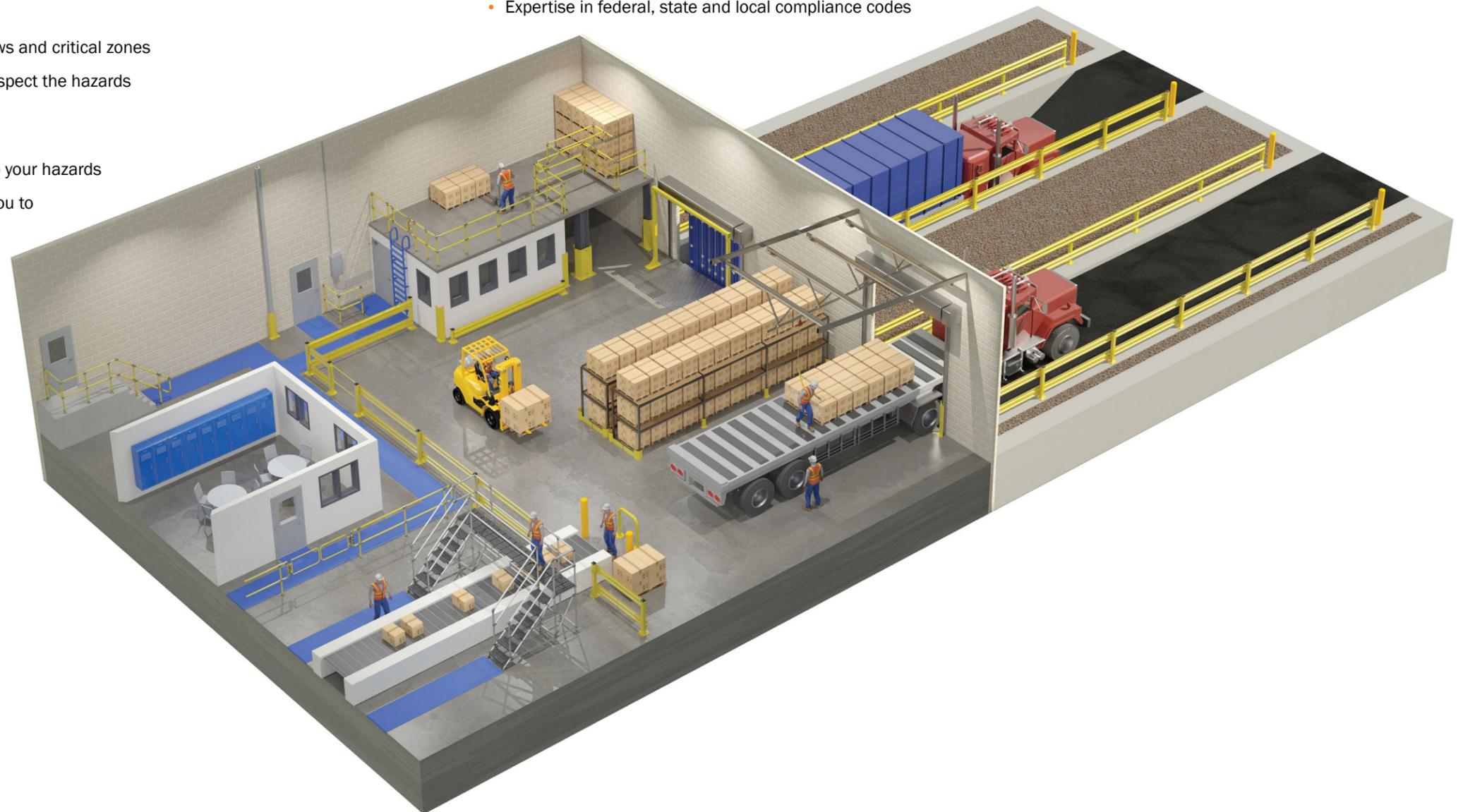
How to Use the Guide

This guide is broken into two primary sections:

Protecting People (page 4) - The most critical asset in any business is people. It is why our priority in any environment is to make sure that your people are safe.

Protecting Plant & Product (page 16) - Damage to equipment within a plant could impact the safety of your workforce, but will definitely impact your operating efficiencies and bottom line.

In each section we will examine the most common hazards, a risk matrix for evaluating those hazards and a set of solutions to address those hazards. Along the way we will also call out industry standards and other helpful information to aid you in properly assessing your hazards.



PROTECTING PEOPLE FROM FALLS & IMPACTS

The most critical asset in any business is people. Our priority in any environment is to make sure that your people are safe. While damaging structural components or storage racking have secondary implications on worker safety, our first focus is on where human life can be impacted by the operations within a facility. Our solutions focus on two of the most dangerous hazards in a facility: impact hazards and fall hazards.

RISK

How do We Assess the Risk in Your Facility?

Our safety experts perform a critical analysis of your facility's work areas to identify the hazards where workers are exposed to the greatest risk. This ensures that the most dangerous areas are prioritized and protected with solutions that exceed OSHA and industry standards.

We assess risk based on two factors:

1. Potential Severity:

In an internal safety assessment, the severity of a fall-related or impact injury is always assumed to be life-threatening, and therefore should be rated at a Level 5.

2. Likelihood:

The greatest predictor for the likelihood of an accident occurring is to review the frequency of exposure to the hazard.

RISK = SEVERITY x LIKELIHOOD

We prioritize our Risk Assessment based on the **critical danger** and how **frequently** workers are exposed.

LIKELIHOOD

	1 NEAR IMPOSSIBLE	2 UNLIKELY	3 POSSIBLE CHANCE	4 LIKELY	5 ALMOST CERTAIN
1 INSIGNIFICANT	1	2	3	4	5
2 MINOR INJURIES	2	4	6	8	10
3 NOTABLE INJURIES	3	6	9	12	15
4 MAJOR INJURIES	4	8	12	16	20
5 DEBILITATING INJURY DEATH	5	10	15	20	25

Critical Hazards: Address Immediately!

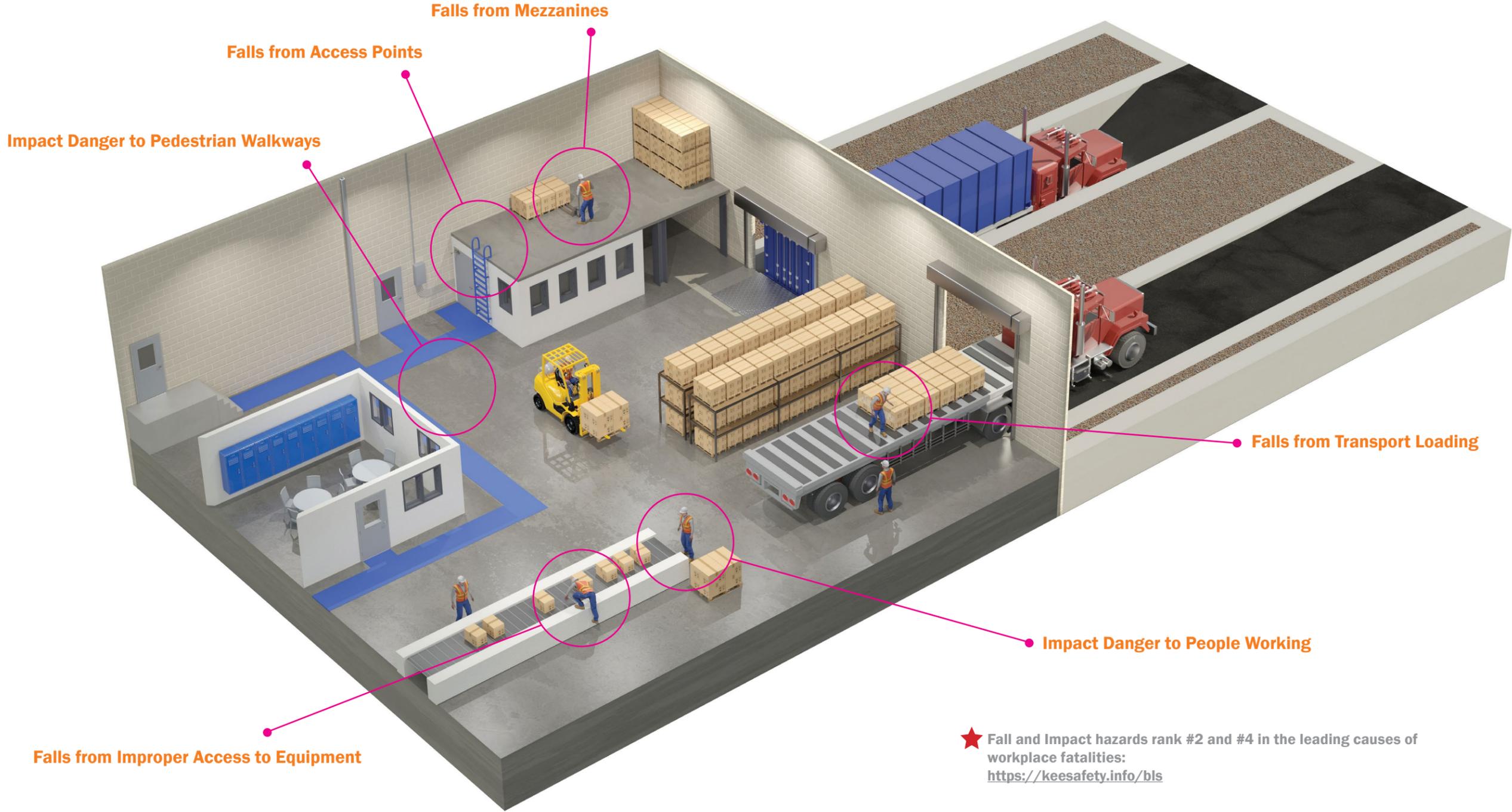
★ Fall protection is the #1 hazard cited by OSHA in the workplace:
<https://keesafety.info/osha>

IDENTIFYING DANGER ZONES IMPACT HAZARDS

Non-transport related vehicles such as forklifts rule the floors inside most warehouses. While useful, they are also dangerous. "Struck by" hazards are the number four killer in work-related fatalities.

IDENTIFYING DANGER ZONES FALL HAZARDS

Fall hazards continue to rank number one in terms of OSHA citations. And for good reason! Fall hazards are among the most dangerous in the workplace, the second leading cause of work-related fatalities.



★ Fall and Impact hazards rank #2 and #4 in the leading causes of workplace fatalities:
<https://keesafety.info/bls>

Protecting People from Impact Hazards

Impact Safety Barriers

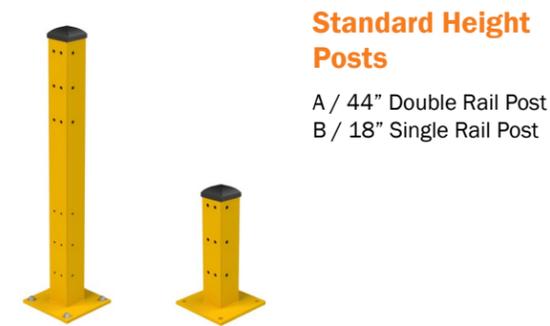
Protecting People from Dangerous Collisions

When it comes to collisions between forklifts and people, people always lose! Industrial Safety Barriers are designed to keep people from harm even when forklift drivers make an error. A select set of modular components allow for guardrails to be constructed quickly and easily. Built from 11 gauge steel, the 2 rib design is made to withstand the industry standard 10,000 lbs @ 5mph.



Versatile Mounting Options

A standard post allows for both inline and corner applications. Guardrail can be mounted to the front, side, or removable brackets to accommodate the different requirements for access and strength.



Standard Height Posts

A / 44" Double Rail Post
B / 18" Single Rail Post



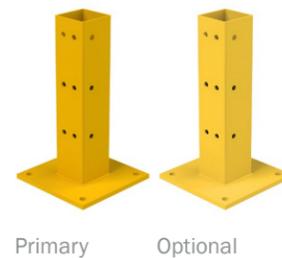
Heavy Duty High Strength Rail

Our high strength 12" rail is designed specifically for in-plant applications. They are constructed from the highest quality hot rolled, cold formed, 11 gauge steel. The rigid two-rib design resists damage and provides additional strength.



Flexibility

A cane bolt pin can be removed from either hinge allowing the gate to swing right or left. When both pivot pins are removed, the section can be quickly removed and set to the side until the access is no longer required.



Primary Color Choice

Our primary color is Traffic Safety Yellow (Federal Standard # 13507) but you also have the option to specify Bright Safety Yellow as an alternate standard color. Custom colors are also available, but will impact the cost and lead time of the system.



Kee Klamp® Modular Railing

Protecting Pedestrians and Workers

Kee Klamp Modular Railing is an ideal solution for creating clear demarcated walkways and working areas. Railing creates a strong visual and physical barrier that keeps traffic away from pedestrians. Kee Klamp Modular Railing can be configured and ordered within days - no long fabrication delays. The components allow for short lead-times and quick construction. Railings can be designed to suit any walkway. Damaged railings can be replaced quickly and easily.

A variety of fixing options are available.



Kwik Kit®: Simple Configuration for Safety Railing

Kwik Kit Safety Railing makes it even easier to design and order safety railing for your warehouse. Railing is already powder-coated in safety yellow and the kits come in three simple configurations. Simply cut the system to length on site.



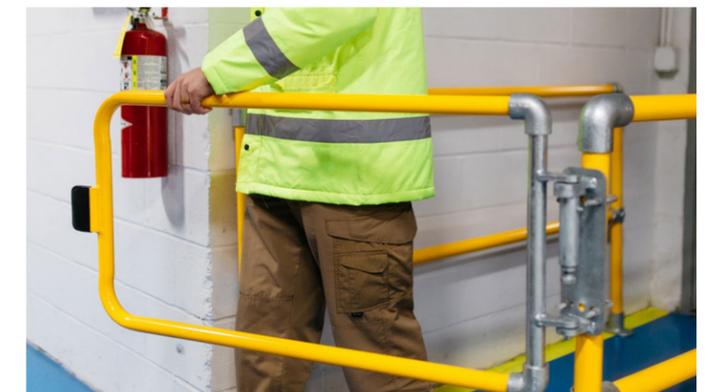
3 Standard Kits



Kee Gate® Self-Closing Gates

Create Awareness when Exiting Safe Zones

Walking through a warehouse can be a dangerous matter. Placing safety gates at the exit points from safe zones helps people to realize they are entering a dangerous area. The Kee Gate range of self-closing safety gates provide permanent hazard protection for external and internal access applications. Spring-loaded to automatically close behind the user, Kee Gate maintains a safe environment and reduces the possibility for human error.



Features

- Heavy duty, hot-dipped galvanized steel
- Powder-coated or galvanized finish
- Spring-loaded to close automatically
- Suitable for exterior or indoor use
- Supplied with u-bolts for secure, quick assembly to existing structures and posts

Easy Integration

- Easily installed using simple hand tools
- Integrates into existing guardrails and customizable to fit your needs

Consistent Safety

- Cycle tested to ensure quality
- Self-closing provides constant safety
- Durable, high quality solution

Protecting People from Fall Hazards

Kee Gate® Pallet Gate

Safely Load & Unload Goods from Mezzanines

Mezzanines act as key storage locations inside of many warehousing facilities. The loading and unloading of goods from Mezzanines can create a dangerous fall hazard if not properly protected. Kee Gate Pallet Gates are designed to protect people who are moving goods on and off the mezzanine. The easy to operate swing gate can be operated by one individual. Closing the gate on the mezzanine allows goods to be loaded. Opening the gate protects the loading edge so that workers can remove the goods.

Benefits

- **Maintain OSHA Compliance** – All guardrail compliant to OSHA 1910.29(b)(1-4) including toeboard
- **Reduced Downtime** – No electric or complex machinery that will break
- **Long Lasting** – Galvanization under powder coating ensures that product will not rust, even when dinged. Aluminum versions are also available
- **Fits in your Facility** – can be modified to suit larger and smaller openings



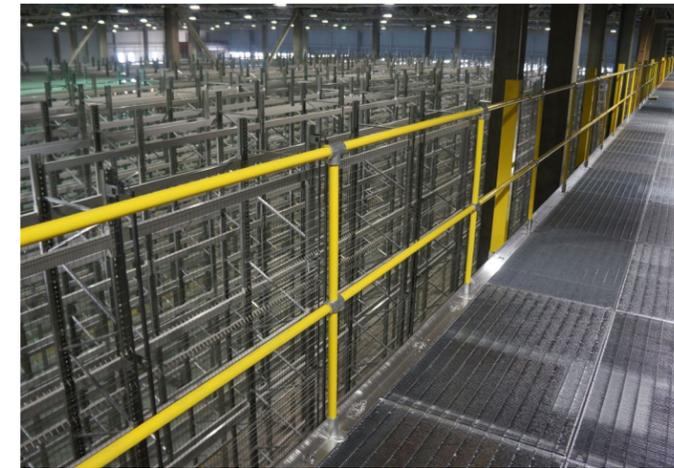
Kee Gate® Self-Closing Gates

Fall Protection for Ladder & Stairway Access Points

The Kee Gate range of self-closing safety gates provide permanent hazard protection for external and internal access applications. Spring-loaded to automatically close behind the user, Kee Gate maintains a safe environment and reduces the possibility for human error. OSHA compliant Kee Gates are available in hot-dipped galvanized or powder coated safety yellow, are easily adjustable on site and accommodate a wide range of openings.

Features

- Galvanized or Powder-Coated options
- Available in a full-range of sizes from 18 inches up to 48 inches wide
- Fully adjustable on-site with basic hand tools



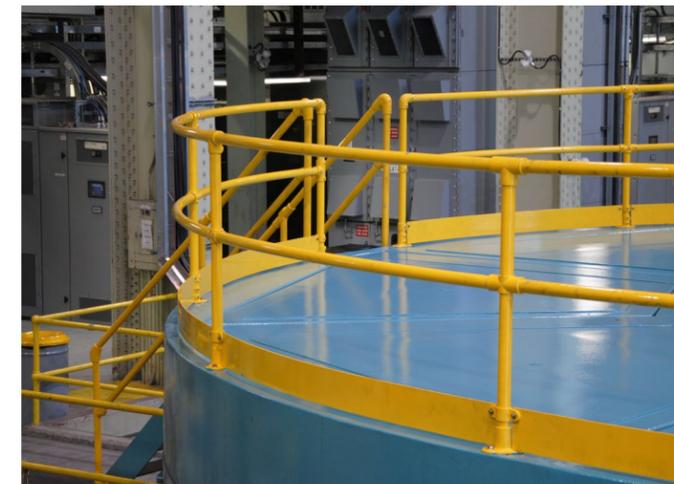
Kee Klamp® Modular Railing

Easy to Install OSHA Compliant Railing for Mezzanines

OSHA regulations specify that any fall hazard over 4 feet in height must be protected. The safest method of providing protection is separating people from fall hazards with railing. Kee Klamp Modular Railing protects people from falling from mezzanines.

Benefits

- **Compliance is #1** – Kee Klamp components have been in the market for over 80 years ensuring safety on and off the job site
- **Quick to Specify and Install** – made from readily available components, OSHA railings can go up quick with minimal configuration
- **Limited Disruption** – No welding or advanced fitting on site – modular components mean you can build to suit on site without the need of hot permits
- **Easy to Replace** – if a railing gets damaged, modular Kee Klamp components make replacing a pipe or upright simple
- **Retrofit Compatible** – if you have other railing systems already installed this is not a problem. Add-on fittings can integrate a Kee Klamp railing into your existing systems
- **Long-lasting** – Railing and component come galvanized, so moisture will not be an issue in the long term. Aluminum components and railing are also available for more corrosive environments



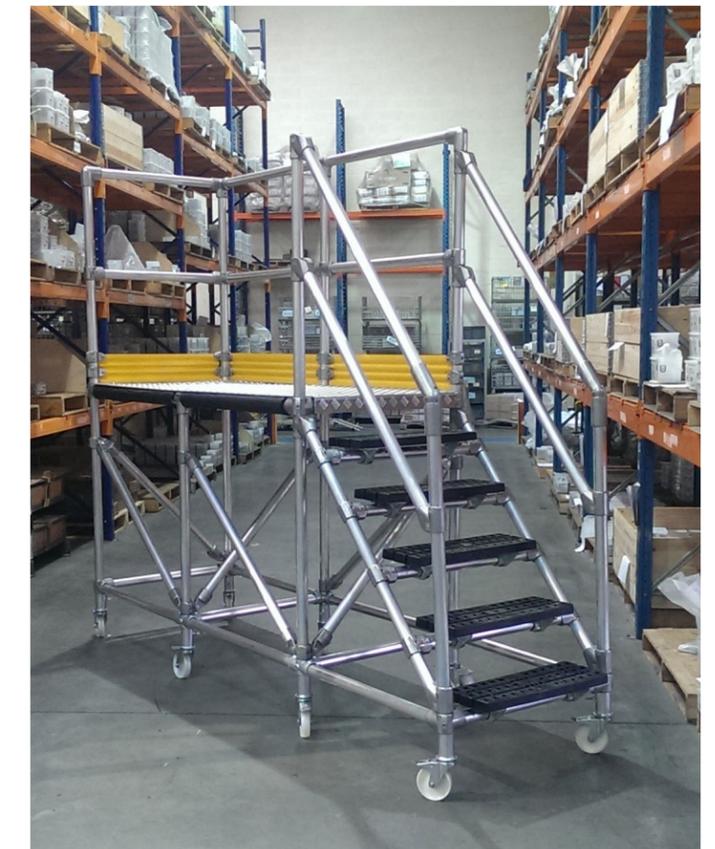
Engineered Access Platforms

Providing Access without the Risk

We have all seen it. The person who is reaching out or standing on something unsafe to access a piece of equipment. Unfortunately, when equipment is installed, there is not always a thorough understanding of how it will need to be maintained, repaired, or accessed. Kee Safety Engineered Access Platforms can be designed to reach complex places with ease. Made from modular Kee Klamp components, access platforms can be designed to suit any task with minimal disruption to existing work processes.

Features

- **Modular Components** – for ease of installation and on-site adjustment
- **Designed to Fit** – custom configuration means that it will fit exactly where it needs to. No using other standard ladders for a job that does not suit
- **Pre Assembled Sections** – we will ship the platform in large sections that makes it easy to transport to the installation location. Large sections means that installation can take place with minimal disruption



Protecting People from Fall Hazards

Kee Track® Overhead Rigid Rail Fall Protection for Loading and Manufacturing

In many facilities there is a need to access the back of trucks and vehicles to package goods for shipment. Kee Track offers dependable safety and short fall arrest distances when loading and working on top of mobile equipment. Fixed to the ceiling with a unique range of mounting options, Kee Track is designed to maintain an open floor plan using structurally-

mounted, low-profile rails that maximize work zones. The Kee Track system compliments warehouse and facility environments that are constructed with both high or standard roof heights. Kee Track requires no column supports and is flexible to work around most platform infrastructures.



Connection Types



Purlin Structures

I-Beams

Open Web Steel Joists

Concrete Decks

Features

- Easy and quick installation*
- Flexibility for multiple structures
- OSHA compliant
- Sturdy and dependable rigid track system
- Lightweight traveller with sealed bearings

Benefits

- Requires standard tools and basic lifting device
- Attaches directly to primary steel framework
- Safety tested for superior protection
- Modular design is adaptable and re-configurable
- Hands-free movement for tasks at height

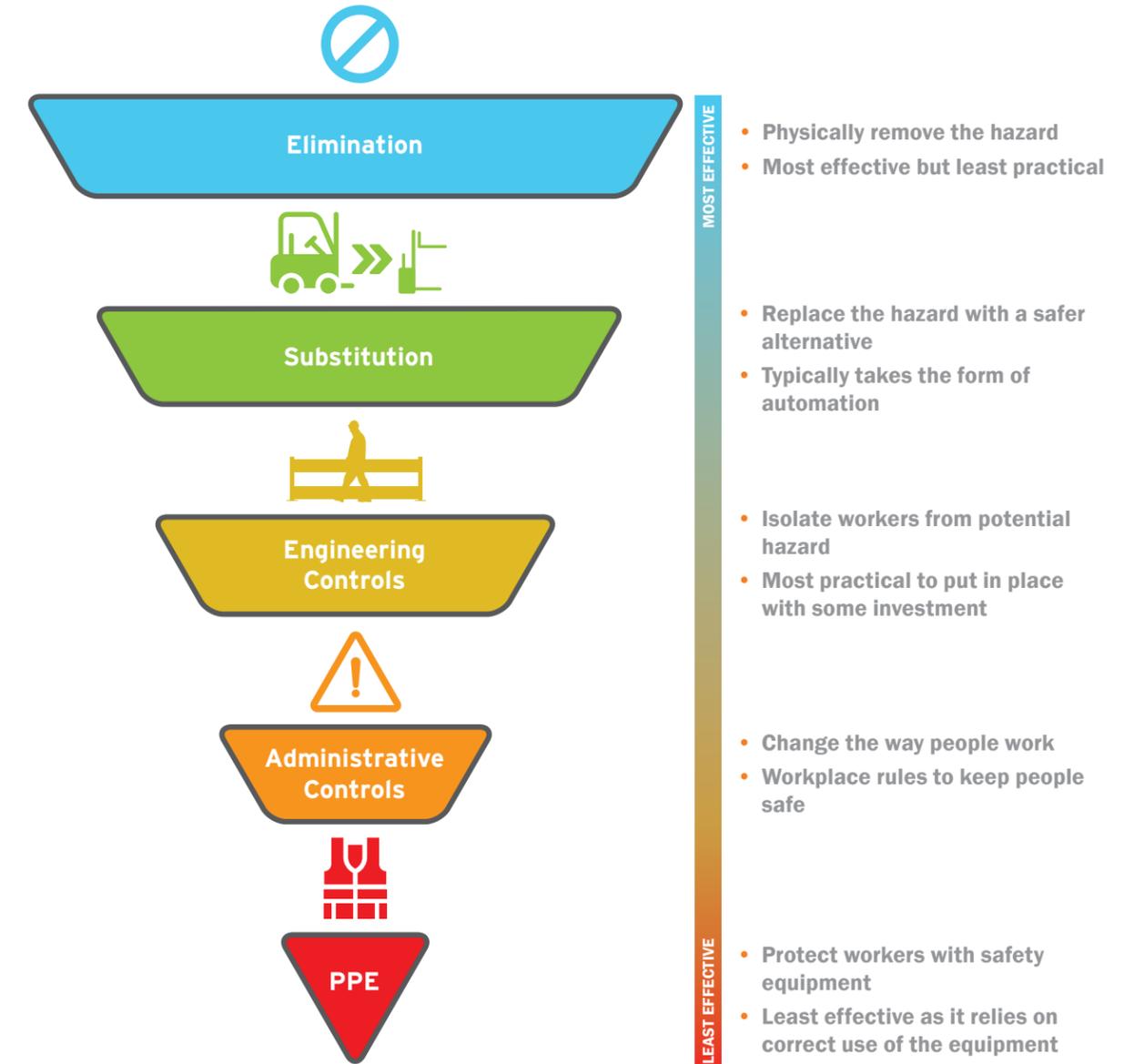
* Kee Track must be engineered and installed by an authorized Kee Safety installer.

ASSESSMENT

The Hierarchy of Controls

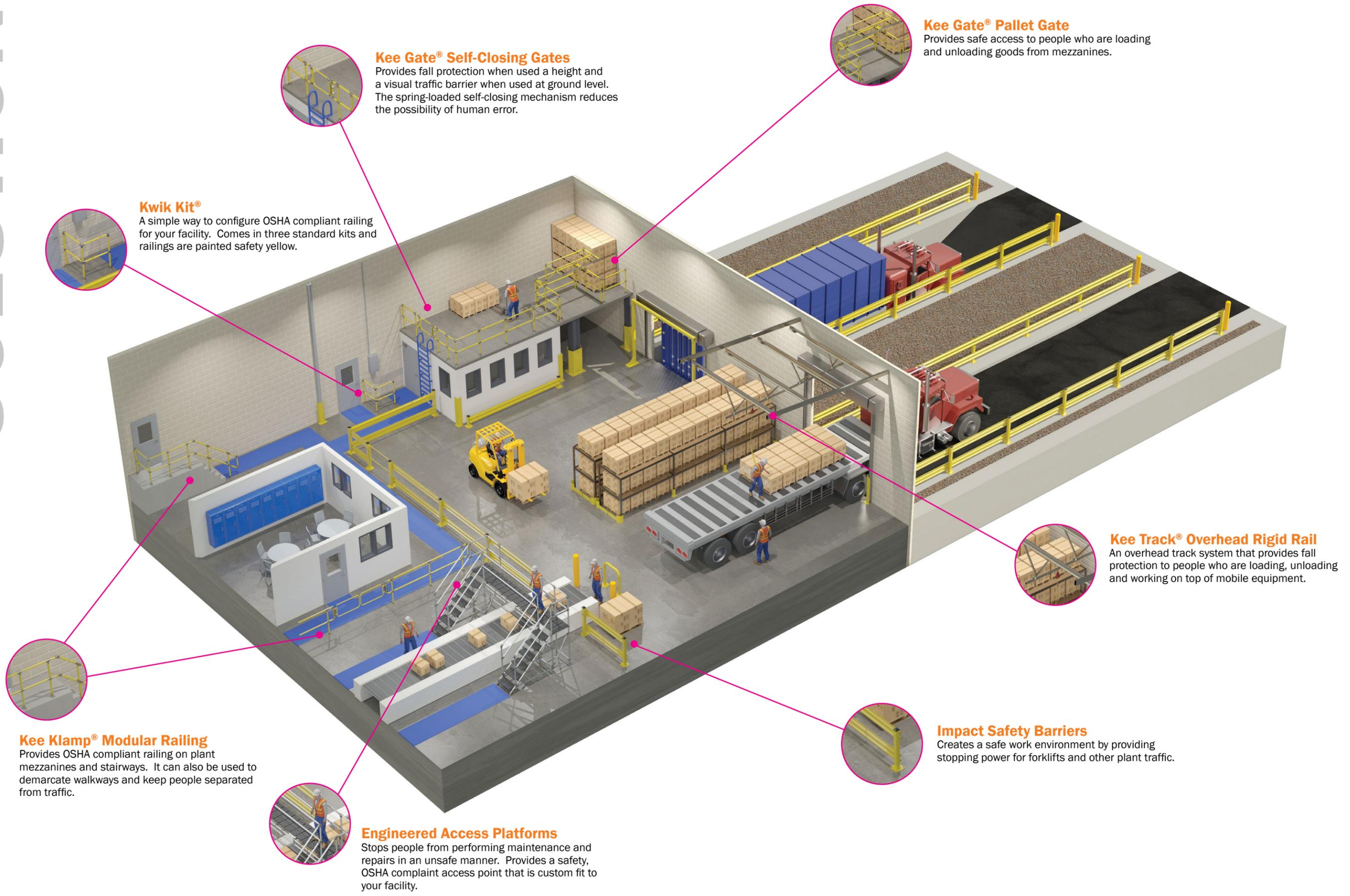
We know that we have hazards in our plant, but what is the best way to protect our people? At Kee Safety we follow the guiding principles behind the Hierarchy of Controls.

In our experience the key is to find balance. The most effective solution is often the most impractical, while the most practical solution is also the least effective. When inspecting facilities we will look for ways to eliminate or substitute hazards, but we will most likely recommend engineering controls, or isolating people from the potential hazard.



Change the Process, not the Person

A quick search on YouTube will show you how foolish people can be. Do you really want to put the future of your business into the hands of a forklift operator? People are very hard to change but putting controls and barriers (process) in place can build the proper protection for your business and employees.



Kee Gate® Self-Closing Gates
Provides fall protection when used at a height and a visual traffic barrier when used at ground level. The spring-loaded self-closing mechanism reduces the possibility of human error.

Kee Gate® Pallet Gate
Provides safe access to people who are loading and unloading goods from mezzanines.

Kwik Kit®
A simple way to configure OSHA compliant railing for your facility. Comes in three standard kits and railings are painted safety yellow.

Kee Track® Overhead Rigid Rail
An overhead track system that provides fall protection to people who are loading, unloading and working on top of mobile equipment.

Kee Klamp® Modular Railing
Provides OSHA compliant railing on plant mezzanines and stairways. It can also be used to demarcate walkways and keep people separated from traffic.

Impact Safety Barriers
Creates a safe work environment by providing stopping power for forklifts and other plant traffic.

Engineered Access Platforms
Stops people from performing maintenance and repairs in an unsafe manner. Provides a safety, OSHA compliant access point that is custom fit to your facility.

PROTECTING PLANT & PRODUCT

Damage to equipment within a plant could impact the safety of your workforce, but will definitely impact your operating efficiencies and bottom line. Damaging your overhead door track at a loading dock could have a major disruption in your ability to receive and ship goods. In this section we focus on areas where in-plant vehicles may damage plant machinery, the building, or your inventory.

RISK

How do We Assess the Risk in Your Facility?

Our safety experts perform a critical analysis of your facility's work areas to identify the hazards where your facility, inventory and equipment is exposed to the greatest risk. This ensures that the most meaningful areas are prioritized and protected with solutions that exceed industry standards.

We assess risk based on two factors:

1. Operational Severity:

In an internal safety assessment, we evaluate severity by the level of impact it will have on the profitability and operational capacity of the business. Where an impact could result in a catastrophic impact to the business or day-to-day operation, we rate those at a severity level 5.

2. Likelihood:

The greatest predictor for the likelihood of an accident occurring is to review the frequency of exposure to the hazard.

RISK = SEVERITY x LIKELIHOOD

We prioritize our risk assessment based on the severity of the impact and how frequently the object is exposed to potential damage.

LIKELIHOOD

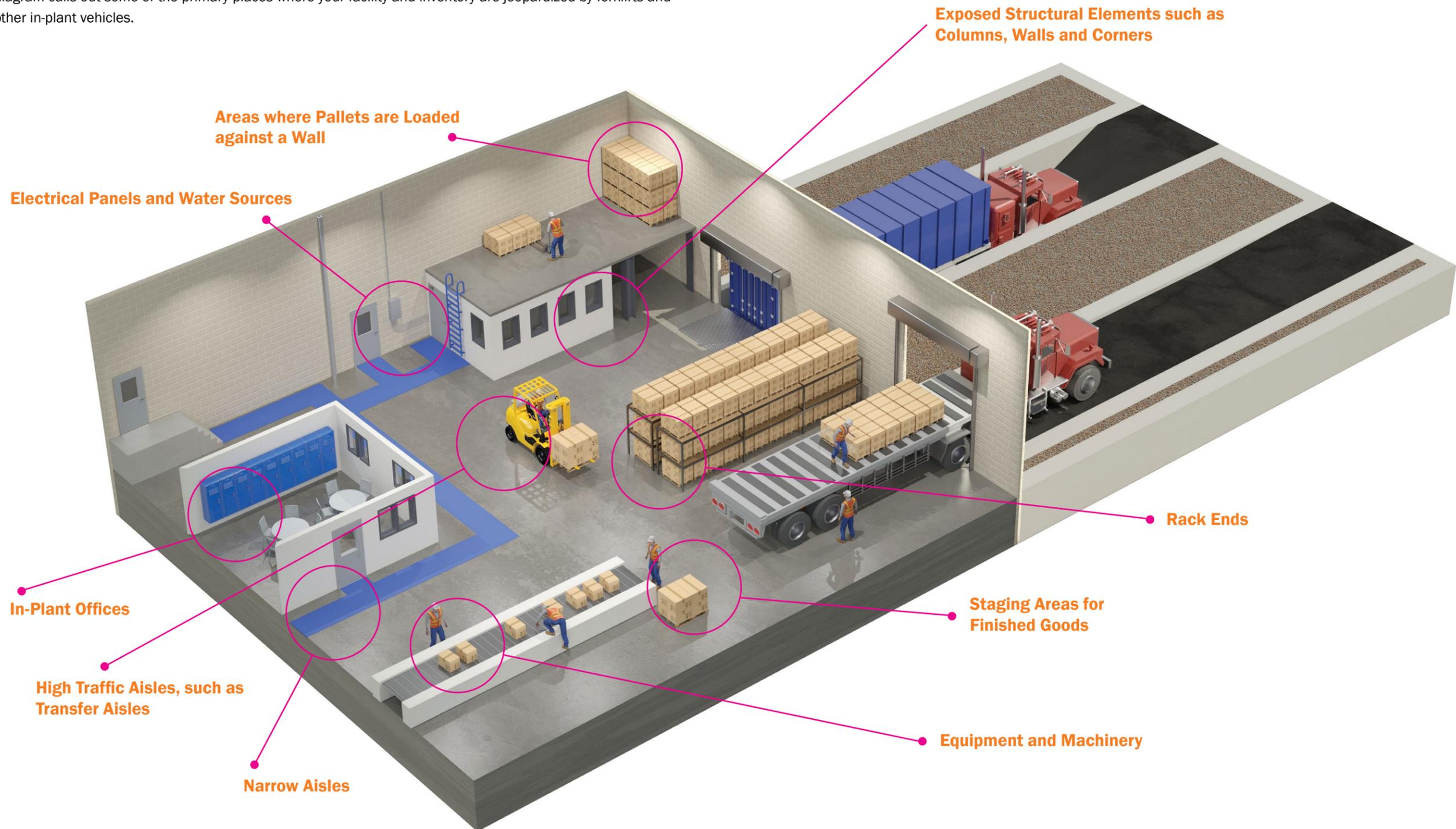
OPERATIONAL SEVERITY

	1 NEAR IMPOSSIBLE	2 UNLIKELY	3 POSSIBLE CHANCE	4 LIKELY	5 ALMOST CERTAIN
1 \$	1	2	3	4	5
2 \$\$	2	4	6	8	10
3 \$\$\$	3	6	9	12	15
4 \$\$\$\$	4	8	12	16	20
5 \$\$\$\$\$	5	10	15	20	25

Critical Hazards: Address Immediately!

IDENTIFYING DANGER ZONES PLANT AND PRODUCT HAZARDS

Business today requires a rapid pace. A consequence of this speed is a reduction in environmental awareness. While we expect all operators to drive responsibly, experience tells us that accidents will still occur. This diagram calls out some of the primary places where your facility and inventory are jeopardized by forklifts and other in-plant vehicles.



Protecting Plant & Product from Impact Hazards

Impact Safety Barriers

Heavy-duty Barriers to Stop Traffic from Damaging Your Facility

Forklifts are powerful tools that enable your business to operate efficiently. When in plant traffic is not properly managed, they can become a serious hazard. Impact Safety Barriers ensure adequate separation between your people and in-plant mobile equipment. Rated to stop a loaded forklift moving at 5 mph, our heavy-duty steel Impact Safety Barriers have been an industry standard for over 30 years.



For full configuration information please refer to Page 8

Corner Shield

Keep Your Forklift Traffic from Cutting Corners

Standard in-plant offices are not always designed to withstand an impact from a heavy piece of equipment. Corner Shield has been designed to prevent unexpected impacts, protecting both the structure and the people inside.

Features

- Available in three standard heights: 30", 42", and 48"
- Protects delicate sheetrock and walls from impact damage
- Simple to install with included hardware



Corner Rack Guards

Designed to wrap around the corners of your pallet racking, these guards protect against a collision at any angle. Sold in pairs, rack guards can be connected with infill floor angle.

- Available in standard (26") and long (42") options
- Available with a 6" or 10" radius on the protective cap.
- Use floor angle filler to connect endcap racking
- More durable and cost-effective when compared with structural options
- Easy installation

Floor Angle

Multi-purpose Guard to Keep Business on Track

Floor angle is a simple and effective way to keep rolling equipment away from racking, fencing, walls and other plant structures and equipment.



Pallet Rack Guards

Protects Your Inventory with Impact Isolation

A collision with warehouse racking can destroy thousands of dollars in inventory and put people's lives at risk. A simple and effective solution, rack guards put a barrier between your inventory racking and in-plant vehicles.

★ Read more about Impact Isolation on page 26



Upright Rack Guards

Forklifts that are backing up can endanger structural elements in the middle of rack. Isolate the impact to racking from these dangerous mistakes.

- Available in two heights: 12" & 18"
- Provides maximum protection without interfering with normal operation
- Protects against both front and side heavy duty impacts
- Easy to replace if damaged
- Highly visible color scheme warns drivers in under low lighting conditions

Features

- Available in two heights 4" and 6" and two standard lengths: 5' and 10'
- Custom cut lengths are available
- High visibility color matched with other plant safety barriers
- Floor anchoring hardware is included

Uses

- Defining areas where forklift and other rolling equipment cannot enter
- Creating a wall guard where pallets are being stacked against a wall
- Connecting two corner pallet rack guards

Protecting Plant & Product from Impact Hazards

Column Guards

Stop Your Forklifts from Bringing Down the House

Ask any structural engineer, load bearing columns are not designed to take the impact of facility traffic. Structural damage can endanger lives as well as create costly repairs and delays. Create an isolation zone around your columns with Column Guards.



Features

- Comes in a set of two to completely surround the column
- Standard height of 42"
- Available in small (8"-10") and large (12"-14") column guards and in custom sizes
- Extensions available for extra-wide or double columns
- Guards attach to each other and the floor, NOT the column
- All mounting hardware is included

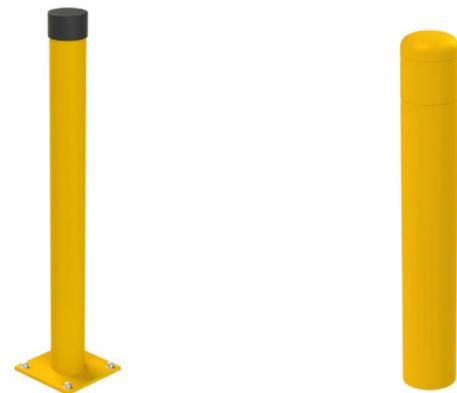
Benefits

- Eliminates damage to H-beam, round and square building columns
- Aesthetically matched to keep your warehouse looking clean

Bollards

Simple, Effective Way to Eliminate Damage

Bollards have been around a long time for a reason: they work! Bollards are simple and can be installed just about anywhere to protect just about anything. Bollards are available with added features such as guardrail intermediates.



Pipe Guards

Protective Barrier for Wall Mounted Pipes and Downspouts

Damage to a pipe or conduit could result in a fire, smoke, or flood damage. The impact to your inventory and production could be catastrophic. Don't leave the future of your business in the hands of your plant vehicle operators. Pipe Guards put a protective barrier around water and electrical pipe and conduit, eliminating the possibility of catastrophic impact.



Features

- Standard height of 36"
- Standard guard protects a pipe up to 6" in diameter
- Custom sizes available for virtually any size pipe

★ **Attaching guards to structural members still passes energy to the structure! See page 26 to learn more about proper structural isolation**

Door Track Guards

Keep Your Rolling Doors Operational

The most common damage to a rolling door is to the track. Damage to the track can seal a door closed or open. Serious damage can cause the door to come loose and cause a more significant safety hazard.

Features

- More complete coverage than standard bollards
- Provides protection without interfering with normal door operation
- Easy to install and replace
- Protects against front and side impact



Z-Guard

- Universal design can be installed on the left or right by mounting to the wall
- Easy to keep in stock in case of damage
- 48" of protective steel wrapping

Track Guard

- Sold in left/right pairs for both sides of the rolling door
- Floor mounted for greater impact resistance
- 48" of protective steel wrapping

Goal Post Guards

Prevents Damage to Rolling Doors Above and Below

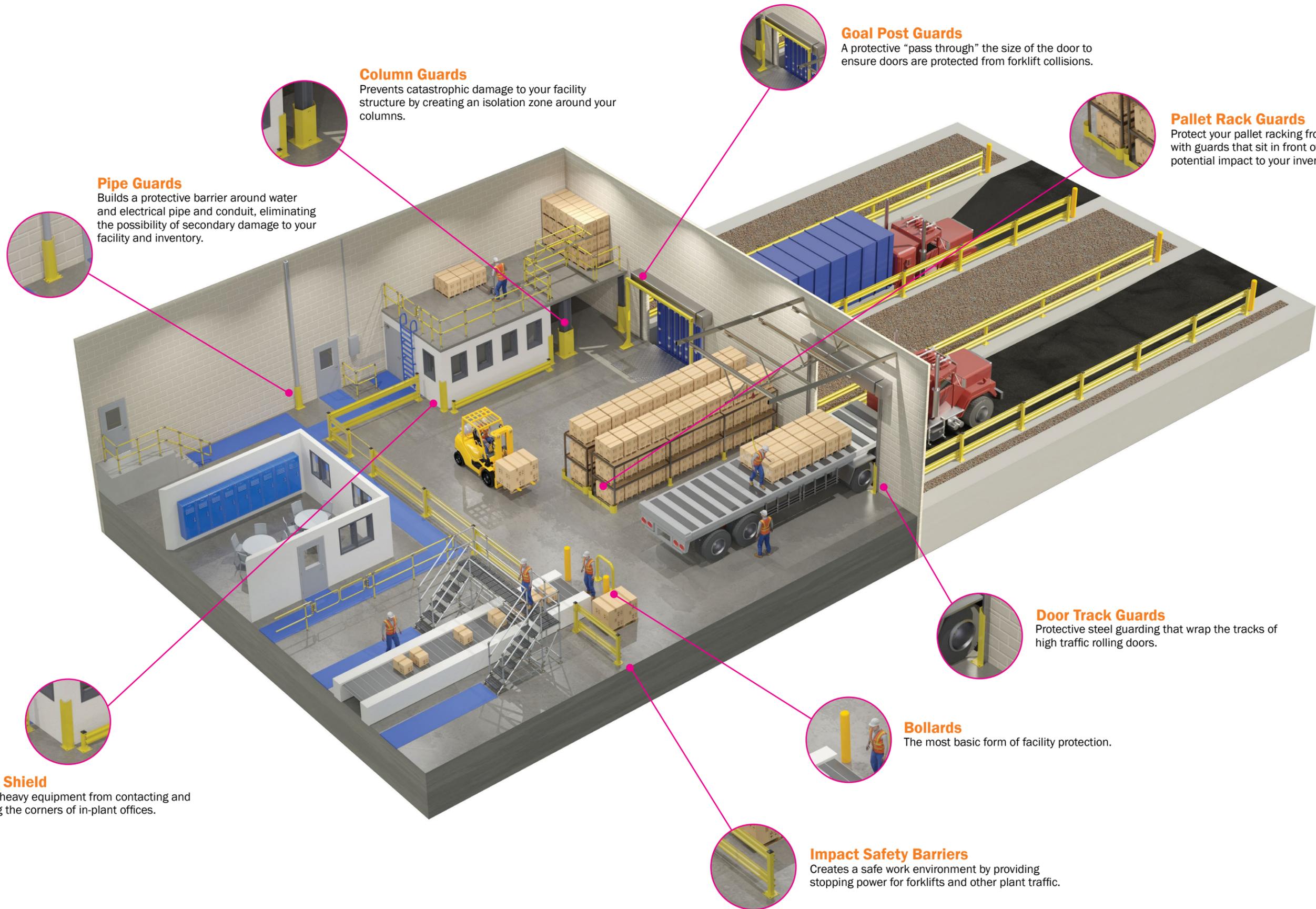
In taller warehouses, forklifts can accidentally extend their vertical reach above the height of a door. Running into a rolling door can cause damage that leads to delays and operational losses. Goal Post Guards create a "pass through" the size of the door to ensure doors are protected from harm.



Features

- Standard sizes available for common rolling door sizes
- Can be ordered to suit any size rolling door
- Does not interfere with normal door operation
- Ensures that forklifts approach the door with their load in the correct position and at the correct height
- Eliminates damage to the overhead door, as well as to the door tracks

SOLUTIONS



Pipe Guards
Builds a protective barrier around water and electrical pipe and conduit, eliminating the possibility of secondary damage to your facility and inventory.

Column Guards
Prevents catastrophic damage to your facility structure by creating an isolation zone around your columns.

Goal Post Guards
A protective "pass through" the size of the door to ensure doors are protected from forklift collisions.

Pallet Rack Guards
Protect your pallet racking from catastrophic failure with guards that sit in front of racking, isolating any potential impact to your inventory.

Door Track Guards
Protective steel guarding that wrap the tracks of high traffic rolling doors.

Bollards
The most basic form of facility protection.

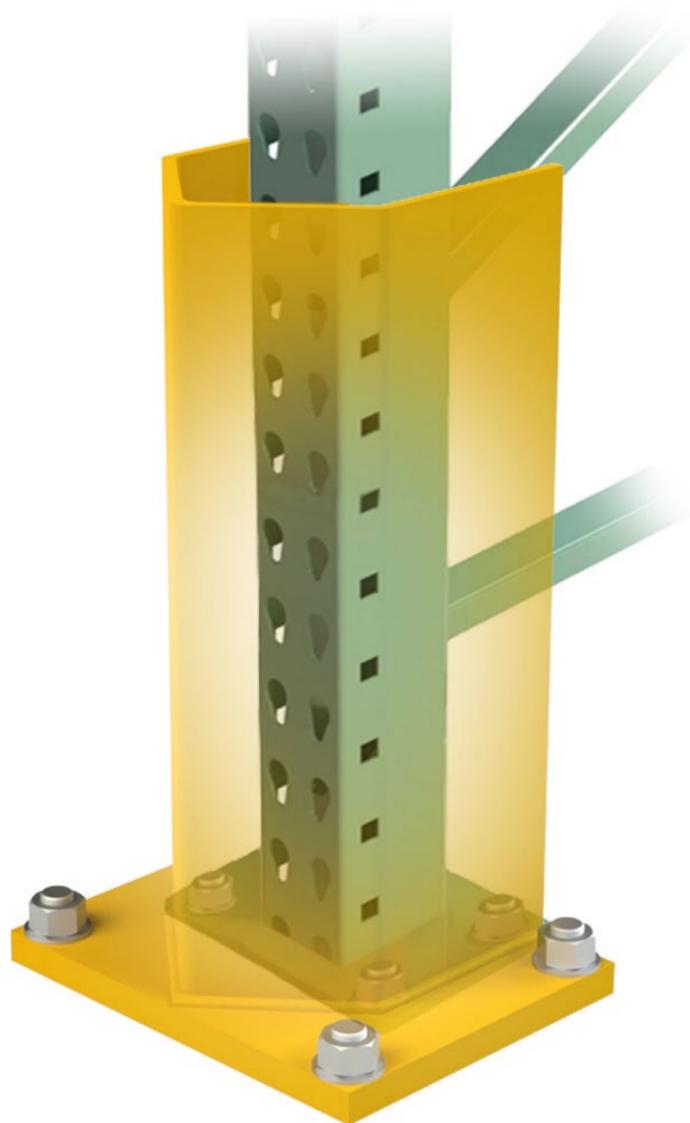
Impact Safety Barriers
Creates a safe work environment by providing stopping power for forklifts and other plant traffic.

Corner Shield
Prevents heavy equipment from contacting and damaging the corners of in-plant offices.

Isolating the Impact

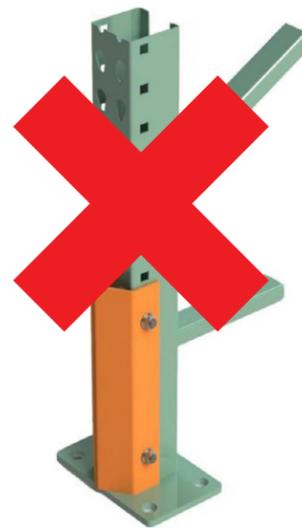
A basic lesson in physics

Damage occurs when energy is transferred from one object (forklift) to another (rack connection bolt). Unless a barrier isolates the energy transferred from a collision, that energy will be passed to the object that is contacted. This will damage the connection method, and potentially cause catastrophic effects.



Impact NOT Isolated

Guards that attach directly to the object may protect against a ding or scratch, but they are going to be useless in the face of a real collision. Ensure your guards are not attached to the object you are protecting.



Regulations

OSHA has updated their standards to help protect workers who are working at height and in the warehouse. Below is an outline of relevant standards that apply to the hazards listed in this document.

General Duty

Section 5(a)(1) of the OSH Act of 1970

The section says, “each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.” As an employer, in addition to specific regulations, you must actively identify hazards that are likely to cause serious injury and take steps to protect your employees.

Impact Hazards

Material Handling 1910.176(a)

“Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstruction across or in aisles that could create a hazard. Permanent aisles and passageways shall be appropriately marked.”

Fall Hazards

Access Points: 1910.28(b)(3)(iv)

Each employee is protected from falling into a ladder way, floor hole, or ladder way platform hole by a guardrail system and toe boards erected on all exposed sides, except at the entrance to the hole, where a self-closing gate or an offset must be used*.

*Chains are no longer permitted for use as a fall protection system on rooftop access points.

Stairways: 1910.28(b)(11)(i) & 1910.28(b)(11)(ii)

Each employee exposed to an unprotected side or edge of a stairway landing that is 4 feet (1.2 m) or more above a lower level is protected by a guardrail or stair rail system; Each flight of stairs having at least 3 treads and at least 4 risers is equipped with stair rail systems and handrails*.

*See regulation for full explanation of handrail requirements.

Unprotected Edges: 1910.28(b)(1)(i)

The employer must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4 feet (1.2 m) or more above a lower level is protected from falling.



Keep Safety: Your Fall Protection Experts

Keep Safety is the leading expert and global manufacturer of safety components and fall protection systems. We are fully committed to Separating People from Hazards.

Established in 1934, Keep Safety has a proud history of engineering, manufacturing, and supplying the most trusted fall protection solutions, safety railing systems, and safe access equipment for working at height.

Get Protected Inside and Out

The document you are holding helps you protect the inside of your facility, but what about fall hazards on the outside of your building? Follow the link below or talk to your sales person about our companion guide: Facility Safety Solutions: Rooftop Fall Protection.

<https://keesafety.info/fps>



Canada

Keep Safety, Ltd.
40 North Rivermede Road, Units 6 - 7
Concord, Ontario L4K 2H3

Tel: (905) 669 1494
Fax: (905) 669 4347
Toll Free: (877) 505 5003

www.keesafety.ca