

Safety Best Practices Recommendation
CEMA SBP-004
**Supplemental Guarding for Unit
Handling Conveyors**



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1. PURPOSE

The purpose of this document is to outline a standardized approach to the selection and application of supplemental guarding that is used on unit handling conveyors.

These approaches flow from the collective experience of the member companies of the Unit Handling Section of the Conveyor Equipment Manufacturers Association (CEMA). Their recommendations have been compiled herein to promote a safe operating environment for personnel working next to or around unit handling conveyors.

The products that Conveyor Manufacturers produce and incorporate into the end solutions that are delivered to customers have many safeguarding features. These safeguards are generally classified into one of two types.

The first type is comprised of safeguards designed into the equipment and are added during the manufacturing phase of that equipment. Examples of these types of safety features are finger guards, drivetrain covers, etc.

The second type is comprised of other necessary safeguards that need to be added to the equipment during the installation phase of the solution. These safeguards that are added during the installation phase are referred to as “Supplemental Guarding” in this document. The scope of this document is intended to provide information regarding the application of these Supplemental Guarding elements.

2. DEFINITIONS

The definitions of terms used within this standard will conform to those identified in ANSI/CEMA Standard No.102 “Conveyor Terms and Definitions” except as redefined within this section.

2.1. Bottom Guard

Guarding added to the underside of a conveyor to protect personnel from exposure to hazardous moving parts or other potential hazards. The bottom guard should be made of material that prevents personnel from reaching around or reaching through openings to guard against contact to potentially hazardous moving parts or other hazards. Furthermore, the mounting method shall require the use of a tool for removal (Reference ANSI B11.19 - Performance Criteria for Safeguarding)

2.2. Barrier Guard

A single barrier installed to prevent personnel access to a particular location that contains hazardous moving parts or other potential hazards. The barrier should be sized and placed such that personnel cannot reach over, around, underneath, or through openings in the barrier to contact potentially hazardous moving parts or other hazards. The material and mounting method shall be robust enough that the barrier does not allow personnel to contact potentially hazardous moving parts or other hazards. Furthermore, the mounting method shall require the use of a tool for removal (Reference ANSI B11.19 - Performance Criteria for Safeguarding)

2.3. Perimeter Fencing

A series of barriers installed to prevent personnel access to potentially hazardous moving parts or other hazards within a defined area. The height and placement of the perimeter fence shall be such that personnel cannot reach over, around, underneath, or through openings in the perimeter fence to contact hazardous moving parts or other hazards. The material and mounting method shall be robust enough that the perimeter fence cannot be manipulated to allow personnel to contact potentially hazardous moving parts or other hazards. (Reference ANSI B11.19 - Performance Criteria for Safeguarding).

3. HUMAN FACTOR CONSIDERATIONS

People and their observed tendencies are the reasons that CEMA has found it necessary to address this topic of dealing with Supplemental Guarding. Operations and maintenance personnel may not always recognize potential hazards while walking around or under operating conveyors when performing tasks such as housekeeping or clearing faults. Conveyor manufacturers typically provide safeguards built into their equipment, but because of the complexity of conveyor systems, the manufacturers cannot always anticipate all the combinations and configurations in which that equipment can be installed. Because of that fact, conveyor installers, integrators, and end users must take into consideration the operational areas where personnel are working and provide safeguards such as supplemental guarding to protect personnel from potential hazards.

Whenever changes or relocation of equipment are made, an evaluation of the equipment and personnel's ability to access potential hazards should be conducted. Supplemental guarding needs to be incorporated to protect personnel from accessing potential hazards. Continuous analysis of worker requirements for mobility and access in the conveyor operating areas is necessary. Proper application and training concerning the use of designated pathways throughout the facility is essential.

4. TYPICAL OPERATIONAL AREAS ACCESSED BY PERSONNEL IN A UNIT HANDLING FACILITY

The typical unit handling facility can have various different types and combinations of equipment that are suited for a particular customer's needs, but the areas within all facilities can be classified by one of four categories. The categorized areas are defined below because Supplemental Guarding requirements may differ between these areas:

4.1. Designated Workstations or Work Areas

A physical location where the system layout has been configured with the intent for a person to be positioned, which is supported with facilities necessary for a person to perform prescribed work duties where they are required to physically interact with the unit handling machinery or are otherwise exposed to a hazard. This position would not apply to maintenance location.

4.2. General Access Area

Designated passageways/walkways where trained operators will travel between workstations and other areas such as break rooms, offices, restrooms, supply rooms, or other areas employees are required to travel in the course of their normal duties. During the course of travel, these operators may utilize stairs, ladders, crossovers, gates, etc. in order to access workstations and may pass under or adjacent to operating conveyor equipment

4.3. Restricted Access Area

Areas of the material handling system that do not meet the above two defined areas and do not have a normal presence of trained operators or allow operators to enter this area in the performance of their normal duties. These areas cannot contain operator workstations, designated operator walkways or passageways, and must have access restricted by a barrier or boundary that includes warning signs indicating that the area is restricted.

4.4. Guarded by Location Areas

This area is comprised of unit handling conveyors that are elevated more than 8'0" above the walking/working surface or otherwise inaccessible by other means. These areas are only accessible by qualified personnel performing maintenance activities through the use of a ladder or personnel lift. These areas do not require any supplemental guarding.

5. SUPPLEMENTAL GUARDING APPLICATION GUIDELINES

The guidelines for Supplemental Guarding are contained in the following sections. The application guidelines will further define these requirements based on the typical areas of the facility as outlined in section 4. These guidelines should be used to determine the selection and application of supplemental guarding that is used on unit handling conveyors; however, a risk assessment taking into consideration the specific details of an individual application, such as the process defined in CEMA Technical Report 2015-01 “Recommended CEMA Risk Assessment Process”, may be used to justify deviation from these guidelines.

5.1. Bottom Guard Application Guidelines

This section will provide direction on when to incorporate supplemental guarding to restrict access from beneath unit handling conveyors to identified hazards that are between the frame rails of the conveyor.

- Designated Workstations or Work Areas - Unit handling conveyors containing exposed moving components that are considered a potential hazard shall be bottom guarded when those moving components are between the elevation of 3 inches and 8 feet measured from the standing surface of the designated workstation or work area and within 36 inches horizontal reach of the boundary of the designated workstation or work area
- General Access Areas - Unit handling conveyors containing exposed moving components that are considered a potential hazard shall be bottom guarded when those moving components are between the elevation of 2 feet 6 inches and 8 feet measured from the standing surface or walkway of the General Access Area and within 36 inches horizontal reach of the boundary of the general access area.
- Restricted Access Area - Bottom guards are not required to be installed on unit handling conveyors that are located within Restricted Access Areas so long as appropriate barriers and warning signs indicate the boundary of this area.

5.2. Barrier Guard Application Guidelines

This section will provide direction on when to incorporate supplemental guarding to restrict access from beside or above unit handling conveyors to identified hazards that are between the frame rails of the conveyor or a result of the conveyed loads and the path that they travel

- Designated Workstations or Work Areas - Barrier guards shall be incorporated to restrict access to all potentially hazardous points that could otherwise be accessed from above or beside unit handling conveyors when the hazard points are found to be below an elevation of 8 feet as measured from the floor or walkway, and within 36 inches horizontal reach from any standing position in a Designated Workstation.
- General Access Area - Barrier guards shall be incorporated to restrict access to all potentially hazardous points that could otherwise be accessed through incidental contact when the hazard points are found to be below an elevation of 8 feet as measured from the floor or walkway, and within 36 inches horizontal reach from any standing position in a General Access Area.
- Restricted Access Area - Barrier Guards are not required to be incorporated to restrict access to individual hazard points that are located within Restricted Access Areas so long as appropriate barriers and warning signs indicate the boundary of this area

5.3. Perimeter Fencing Application Guidelines

- Perimeter Fencing is used to define a barrier between restricted access areas and workstations, work areas, or general access areas.
- Perimeter Fencing is utilized to isolate areas containing single or multiple hazards that are not individually safeguarded. For example, when the hazard point is not confined to a specific location and will not allow the use of barrier guarding without hindering functionality or creating additional hazards, then perimeter fencing shall be applied. Also, when potential hazards are so numerous that individually guarding each hazard is not practical, then perimeter fencing can be applied

- Perimeter Fencing shall contain access gates with appropriate access controls as determined by a risk assessment.
- Openings through perimeter fencing that permit conveyance of loads into, or out of, a restricted area are allowed providing that appropriate measures are taken to prevent personnel from being able to reach or pass through the openings and access hazard points inside of the restricted areas.
- The overall height of perimeter fencing shall be a minimum of 72 in (1829 mm) above adjacent walking surfaces and the opening between the bottom of the fence and the standing surface adjacent to the fence shall not exceed 6 in (152 mm). (Reference ANSI B11.19 - "Performance Criteria for Safeguarding" for additional guidance on the placement of the fence/barrier with respect to the point of hazard and circumstances which may require taller fence/barrier).

6. INSPECTION/MAINTENANCE

Periodic walkthrough and inspection of Supplemental Guarding is necessary to ensure that the guarding remains effective. Inspect the guarding and fasteners to make sure they are tight and secure. Inspection is also required any time work is performed in the area that requires removing or modifying the guarding.