ATTACHMENT "I"

FALL PREVENTION AND PROTECTION PLAN

	Northeastern Illinois Public Safety Training Academy
	Fall Prevention & Protection Program

Operations Policy		
Effective: *2/2020*	**Revised:**	**Approved:**_____ *Executive Director*

Purpose
To provide an understanding of the fall prevention and protection program for the Northeastern Illinois Public Safety Training Academy ("NIPSTA").

Scope
This document will provide guidance for implementing fall prevention and protection measures for all campus operations and training at NIPSTA. The emphasis will be on consistency, safety, and efficiency of operations.

Policy
NIPSTA is committed to the prevention of fall related injuries accidents. As such, NIPSTA has established this fall prevention and protection policy designed to identify, remediate or eliminate hazards and to protect employees, instructors/contractors and students/participants from fall hazards.

NIPSTA's Fall Prevention and Protection Policy outlines the key elements listed in the Occupational Health and Safety Administration's *Occupational Safety and Health Standards*, 29 C.F.R. 1910 (1974). All NIPSTA employees, instructors/contractors and students/participants are required to comply with this policy when working on campus in areas with fall hazards of six (6) feet or more.

Additional information on fall prevention and protection may be shared with instructors on an as needed basis. Additional hazard information specific to training props can be found in the Training Prop Operating Guidelines (see **SECTION IV**).

Fall Prevention and Protection Program Management
The Executive Director is considered the Fall Prevention & Protection Administrator. In collaboration with the NIPSTA Safety Committee and other qualified professionals, applicable duties include:

- Risk assessment and hazard identification
- Plan development and implementation
- Compliance and training

Risk Assessment and Hazard Identification
The Fall Prevention & Protection Administrator, in collaboration with the NIPSTA Safety Committee and other qualified professionals, will assess and identify campus areas with fall exposures of six (6) feet or more where employees, instructors/contractors or students/participants may fall on or in to

hazardous areas. The assessment will also identify best practices for safely accomplishing tasks or training objectives on campus.
Fall prevention & protection best practices will be included in NIPSTA's Risk Management and Campus Operations Plan, training prop policies, and specific course outlines where applicable. While it is understood that fall prevention and protection procedures may be part of a campus training program (e.g. technical rescue), all procedures must comply with the elements listed in 29 C.F.R. 1910 (OSHA, 1974).

Fall Prevention and Protection Procedures

This plan will address the following fall prevention and protection procedures:

1. Personal Fall Arrest Systems
2. Positioning Device Systems
3. Guardrail Systems
4. Warning Line Systems

Personal Fall Arrest Systems

A personal fall arrest system is designed to safely stop a person in a fall from a working level while accomplishing a task, including instructing or participating in training. It consists of the following four (4) elements:

1. Anchorage
2. Connector
3. Full body harness
4. Lanyard, deceleration device and lifeline (or appropriate combination of all three)

Instructors/Contractors and students/participants must be able to promptly rescue a person in the event of a fall sustained during training or ensure individuals who fall are able to rescue themselves. A personal fall arrest system must:

- Limit the maximum arresting force on an individual to eighteen hundred (1800) pounds when using a full body harness. Full body harnesses used for rescue training must meet the requirements listed in the American National Standards Institute's *Fall Protection and Arrest Standard* Z359.11 (ANSI, 2015), and the National Fire Protection Administration's *Standard on Life Safety Rope and Equipment for Emergency Services* 1983 (NFPA, 2017);

- Be rigged so that an individual:
    - Cannot fall more than six (6) feet
    - Cannot come into contact with the lower level, and
    - Is brought to a complete stop with a minimum deceleration distance of three and one half (3 1/2) feet;

- Withstand twice the potential impact energy of an individual free falling a distance of six (6) feet or the free fall distance permitted by the system and sustain the individual within the system/strap configuration without making contact with the individual's neck and chin area;

- Be removed from service if used to prevent a fall;

- Be inspected before each use and/or if subjected to impact;

- Not be attached to a guardrail system or hoist, and;

- Must be rigged so an individual can only travel to the edge of a working surface

Position Device Systems
A position device system is designed to hold an individual in place in order to prevent a fall while accomplishing a task, including instructing or participating in training where using both hands is required. A positioning device must incorporate a full body harness rigged to allow an individual to be supported on an elevated vertical surface (such as a wall or prop) and accomplish tasks with both hands free. The following elements are required:

- Position device systems must be rigged so that an individual cannot free-fall more than two (2) feet.

- Anchors must be able to support two (2) times the potential impact of a fall or three thousand (3000) pounds (whichever is greater).

- Connectors must be:
    - Drop forged, pressed or formed steel, or a comparable material, and;
    - Corrosion resistant with smooth edges to prevent damage to other parts of the system.

- Connection assemblies must have a minimum tensile load of three thousand six hundred (3600) pounds without cracking, breaking or changing shape.

- Carabiners must be auto-locking to prevent unintentional opening.

- Full body harness may only be used as part of a positioning device system; it may not employed for hoisting equipment. Full body harnesses used for rescue training must meet the requirements listed in ANSI Z359.11 (ANSI, 2015) and NFPA 1983 (NFPA, 2017) standards.

- Position device systems must be inspected before each use for damage, deterioration and defects. Any defective components will removed from service and marked as such.

Guardrail Systems
Guardrails are designed as barriers to prevent workers, instructors/contractors or participants/students from falling to lower levels. Guardrails must be used:

- On unprotected sides or edges of ramps or runways
- On unprotected sides or edges of holes
- To restrict access to hoist areas when not used for hoisting

<u>The requirements for guardrail systems are as follows:</u>

- The height of the top rail must be forty-two (42) inches (plus or minus three (3) inches) above the walking/working level. Top rail height may exceed forty-five (45) inches, provided the guardrail system meets all other criteria of this section.

- When there is no wall or parapet wall at least twenty-one (21) inches high, mid-rails, screens, mesh, or an equivalent material must be installed between the top edge of the guardrail system and the working surface.

    - Mid-rails must be midway between the walking surface and the top rail;
    - Screens and mesh must extend from the top rail to the walking surface and cover with entire opening between top rail supports;
    - No openings in a guardrail system may be more than nineteen (19) inches apart, and;
    - Other equivalent intermediate members (such as additional mid-rails and architectural panels) shall be installed so that the openings are not more than nineteen (19) inches wide.

- Guardrail systems must be capable of withstanding, without failure, a force of at least two hundred (200) pounds applied in a downward or outward direction within two (2) inches of the top edge, at any point along the top rail.

- The top height of a guardrail must remain at a height of thirty-nine (39) inches when a two hundred (200) pound force is applied.

- Mid-rails or equivalent structures must be able to withstand, without failure, a one hundred fifty (150) pound force along any point of the structure.

- Materials used in guardrail construction must be smooth surfaced to protect users from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing.

- Ends of top rails and mid-rails must not overhang the terminal posts, except where the overhang does not pose a projection hazard for users.

- Top rails and mid-rails must be at least one quarter (1/4) inches in diameter. Steel or plastic banding shall not be used for top rails or mid-rails.

- When guardrail systems are used at hoist areas, a removable guardrail section, consisting of a top rail and mid-rail, shall be placed across the access opening between guardrail sections when users are not performing hoisting operations.

    - Chains or gates may be used instead of a removable guardrail section at hoist areas if the oversight agency demonstrates that the chains or gates provide a level of safety equivalent to guardrails.

- When guardrail systems are used around holes, they must be installed on all unprotected sides or edges of the hole.

- For guardrail systems used around holes through which materials may be passed:

    - Not more than two (2) sides of the guardrail system shall be removed when materials are being passed through; and

- When materials are not being passed through the hole, the hole must be guarded by a guardrail system along all unprotected sides or edges or closed over with a cover.

- When guardrail systems are used around holes that serve as points of access (such as ladder ways), the guardrail system opening:

  - Shall have a self-closing gate that slides or swings away from the hole, and is equipped with a top rail and mid-rail that meets the requirements listed above; or,
  - Is offset to prevent a user from walking or falling into the hole.

- Guardrail systems on ramps and runways shall be installed along each unprotected side or edge.

Handrails and Stair Rail Systems
Hand and stair rails are designed to assist workers, instructors/contractors or students/participants on walking/working surfaces.

<u>The requirements for handrails and stair rail systems are as follows:</u>

- Handrails shall not be less than thirty (30) inches and not more than thirty-eight (38) inches, as measured from the leading edge of the stair tread to the top surface of the handrail.

  - The height of stair rail systems installed before January 17, 2017 shall not be less than thirty (30) inches from the leading edge of the stair tread to the top surface of the top rail; and,
  - The height of stair rail systems installed on or after January 17, 2017 shall not be not less than forty-two (42) inches from the leading edge of the stair tread to the top surface of the top rail.

- The top rail of a stair rail system may serve as a handrail only when:

  - The height of the stair rail system is not less than thirty-six (36) inches and not more than thirty-eight (38) inches as measured at the leading edge of the stair tread to the top surface of the top rail, and,
  - The top rail of the stair rail system meets the other handrail requirements of this section.

- The minimum clearance between handrails and any other object is two and one quarter (2 ¼) inches.

- Handrails and stair rail systems shall be smooth surfaced to protect employees from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing.

- No opening in a stair rail system shall exceed nineteen (19) inches at its least dimension.

- Handrails shall have the shape and dimension necessary so that employees can grasp the handrail firmly.

- The ends of handrails and stair rail systems shall not present any projection hazards.

- Handrails and the top rails of stair rail systems shall be capable of withstanding, without failure, a force of at least two hundred (200) pounds applied in any downward or outward direction within two (2) inches of any point along the top edge of the rail.

Protection from Falling Objects – Toe Boards
Toe boards are installed and used to protect workers, instructors/contractors or students/participants from falling objects.

The requirements for toe boards are as follows:

- Shall be installed along the exposed edge of the overhead walking-working surface for a length that is sufficient to protect persons below.

- Shall have a minimum vertical height of three and one half (3 ½) inches as measured from the top edge of the toe board to the level of the walking-working surface.

- Shall not have more than a one quarter (1/4) inch clearance or opening above the walking/working surface.

- Shall be solid or not have any opening that exceeds one (1) inch at its greatest dimension.

- Shall be capable of withstanding, without failure, a force of at least fifty (50) pounds applied in any downward or outward direction at any point along the toe board.

- Where tools, equipment, or materials may be piled *higher than the top of the toe board*, paneling or screening shall be installed from the toe board to the mid-rail of the guardrail system, for a length that is sufficient to protect persons below.

- If the items are piled *higher than the mid-rail*, paneling or screening must be installed to the top rail, for a length that is sufficient to protect persons below; and

- All openings in guardrail systems shall be small enough to prevent objects from falling through the opening.

Grab Handles
Grab handled may installed to assist workers, contractors or students when working on, in or around campus props or work areas.

The requirements for grab handles are as follows:

- Shall not be less than twelve (12) inches long.

- Shall be mounted to provide at least three (3) inches of clearance from the framing or opening; and,

- Are capable of withstanding a maximum horizontal pull-out force equal to two (2) times the maximum intended load or two hundred (200) pounds, whichever is greater.

Designated Areas
When designated areas related to fall prevention and protection measures are assigned, training program supervisors shall ensure:

- Students/participants and instructors/contractors remain within the designated area while work or training operations are underway; and,

- The perimeter of the designated area is delineated with a warning line consisting of a rope, wire, tape, or chain that meets the following requirements outlined below.

Warning Line System
A warning line system is used in areas where work or training conditions make it impossible or would create a greater hazard than guardrails or other forms of fall prevention. Warning line systems are designed to alert workers, instructors/contractors or students/participants that they are approaching an unprotected edge.

Warning line systems requirements are as follows:

- Minimum breaking strength of two hundred (200) pounds.

- Installation so that its lowest point, including sag, is not less than thirty four (34) inches and not more than thirty nine (39) inches above the walking-working surface.

- Adequate support so that pulling on one section of the line will not result in slack being taken up in adjacent sections causing the line to fall below the limits specified in this section.

- Visibility from a distance of twenty five (25) feet away and anywhere within the designated area.

- Set up as close to the work/training area as possible; and,

- Set up not less than six (6) feet from the roof or unprotected edge for temporary work/training, or not less than fifteen (15) feet for other work/training.

When mobile mechanical equipment is used to perform temporary work or training in a designated area, supervisors must ensure warning line systems are set up as follows:

- Not less than six (6) feet from the unprotected side or edge that is parallel to the direction in which the mechanical equipment is operated, and,

- Not less than ten (10) feet from the unprotected side or edge that is perpendicular to the direction in which the mechanical equipment is operated.

Safety Net Systems
When or where used, safety net system shall meet the requirements listed in 29 C.F.R. 1926, subpart M.

Hole Covers
Hole covers are designed to protect workers, instructors/contractors or participants/students from falling through open holes in walking or working surfaces.

Working/walking surface hole covers requirements are as follows:

- Covers capable of supporting, without failure, at least twice the maximum intended load that may be imposed on the cover at any one time; and,

- Covers which are secured to prevent accidental displacement.

Fixed Ladder Cages, Wells and Platforms
Fixed ladder cages, wells and platforms are designed to protect workers, instructors/contractors or students/participants when climbing props for work or training evolutions.

The requirements for fixed ladder cages, wells and platforms are as follows:

- Cages and wells installed on fixed ladders shall be designed, constructed, and maintained to permit easy access to, and egress from, the ladder that they enclose;

- Cages and wells shall be continuous throughout the length of the fixed ladder, except for access, egress, and other transfer points;

- Cages and wells shall be designed, constructed, and maintained to contain employees in the event of a fall, and to direct them to a lower landing; and

- Platforms used with fixed ladders shall provide a horizontal surface of at least twenty-four (24) inches by thirty (30) inches.

Ladder Safety Systems
Ladder safety systems are designed to protect workers, instructors/contractors or participants/students when climbing props for work or training evolutions.

The requirements for ladder safety systems are as follows:

- Each ladder safety system shall allow persons to climb up and down using both hands and does not require that users continuously hold, push, or pull any part of the system while climbing;

- The connection between the carrier or lifeline and the point of attachment to the body harness or belt shall not exceed nine (9) inches;

- Mountings for rigid carriers shall be attached at each end of the carrier, with intermediate mountings spaced, as necessary, along the entire length of the carrier so the system has the strength to stop falls;

- Mountings for flexible carriers shall be attached at each end of the carrier and cable guides for flexible carriers are installed at least twenty-five (25) feet apart but not more than forty (40) feet apart along the entire length of the carrier;

- The design and installation of mountings and cable guides shall not reduce the design strength of the ladder; and

- Ladder safety systems and their support systems shall be capable of withstanding, without failure, a drop test consisting of an eighteen (18) inch drop of a five hundred (500) pound weight.

Training

- All employees and instructors/contractors will receive annual training on fall prevention and fall protection. Training will include classroom and proficiency/skills-based training (hands-on).

- At a minimum, information may include:
  - The nature of specific fall hazards in the work or training areas;
  - Correct procedures for maintaining, disassembling and inspecting fall protection equipment and systems;
  - Use and operation of guardrail, personal fall arrest, and any other fall protection systems, as they apply to the campus;
  - The role of each employee in assuring NIPSTA fall protection measures are followed;
  - Any limitations there may be on the use of mechanical equipment on working or training surfaces;
  - Correct procedures for equipment and material handling and storage
  - Use of overhead protection; and
  - Any related OSHA or other safety provisions that may apply to the campus.

- The training shall be conducted in a manner that is understandable.

- The training shall be completed prior to requiring the user to use the fall protection equipment on campus.

- Copies of the standards, guidelines and support materials will be kept on-site for reference and training purposes.

Evaluation

At a minimum, NIPSTA will conduct annual evaluations of campus work and training areas to ensure that the program is effective and that fall protection equipment is being utilized. Annual evaluations will be documented and written records maintained by the Fall Prevention & Protection Administrator. The following will be evaluated:

- The work or training is being conducted in a manner that is understandable to the participants.

- Proper fit and ability to use the equipment without interfering with effective work or training performance;

- Appropriate equipment selection for the hazards which the employee or contractors/instructors are exposed;

- Proper equipment use under work or training conditions; and,

- Proper equipment maintenance.

ATTACHMENTS

None

DISTRIBUTION

REFERENCES

American National Standards Institute (ANSI). (2015). *Fall protection and arrest* (Standard No. z359.11).

National Fire Protection Administration (NFPA). (2017). *Standard on life safety rope and equipment for emergency service*s (Standard No. 1983).

Occupational Safety and Health Standards, 29 C.F.R. §1910 (1974).

Occupational Safety and Health Standards, 29 C.F.R. § 1926 (1979).

DATES

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