APPENDIX D

Fall Protection Training Program

OBJECTIVE:

To explain the proper selection, use and maintenance of fall protection

SUGGESTED MATERIALS TO HAVE ON HAND:

- Fall Protection Video
- Different types of body harnesses, lanyards, lifelines, etc.

INTRODUCTION:

Falls are an almost continuous hazard on construction sites. This hazard is compounded when the structure the worker is on isn't fully built or supported. Providing fall protection on construction sites often takes advanced planning and extensive thought.

GENERAL:

Recent revisions to the fall protection standard requires that all workers exposed to fall hazards of 6 feet or more on construction sites be protected from falling. The three standard methods of fall protection on constructions sites are:

1. guardrail systems (*preferred*),
2. safety net systems, and
3. personal fall arrest systems.

Always try to use one of these systems for fall protection. Guardrails are the preferred method of fall protection, mainly because they prevent the fall from occurring in the first place. Safety nets and personal fall arrest systems are the next preferred methods for fall protection. Both of these systems function after a fall has occurred. Safety nets are preferred over personal fall arrest systems, because if designed and built right, they don't depend on the worker to be effective. Personal fall arrest systems depend on the worker to use them properly in order to provide adequate protection.

There are other less fool-proof fall protection methods available to the construction industry, depending on the work situation. If certain circumstances exist, employers can use one of these other systems. *Using a fall protection system other than guardrails, safety nets, or personal fall protection, can only be done when it can be demonstrated that using guard rails, safety nets, or personal fall arrest systems are infeasible or creates a greater safety hazard*. However, MIOSHA has recognized that certain special situations will often occur and has given guidance on acceptable fall protection alternatives for these situations.

ACCEPTED SPECIAL SITUATIONS:

Leading Edge Work: The leading edge is where the structure is actually being built. Special fall protection systems may be used for leading edge when guard rails, safety nets and personal fall arrest systems are infeasible or create a greater safety hazard. Leading edge work areas are usually protected with a combination of procedures, depending on the configuration of the leading edge. However, when the leading edge work is completed, or work has been stopped, the leading edge is no longer considered a special situation and must be guarded like any other unprotected side.

Overhand Brick Laying: This is work where the mason must lean over the side of a work platform and reach down to lay bricks. This situation is usually addressed by using a controlled access zone and warning line system. However, if the mason has to reach more than 10 inches below the working surface, safety nets or personal fall arrest systems must be used.

Low Slope Roofs: Roofs with a slope of less than 4 inches in 12 (< 18 degrees) are considered low slope and can be addressed with a warning line system in combination with a safety monitoring system. On low slope roofs smaller than 50 feet wide a safety monitoring system alone can be used.

Residential Construction: Residential construction work has been exempted from several portions of the fall protection standard. The Plant Division does not typically do residential construction work, so the pertinent exemptions are not included in this training.

FENCES, BARRICADES, AND COVERS:

Fences, barricades and covers are modifications of guardrails. Fences and barricades can be used around excavations, wells, pits, or shafts. The fence or barricade must be of adequate strength and size to actually stop a person before they reach the hazard.

Covers can be used over floor holes, wells, pits and shafts. When an adequate cover is used, it eliminates the fall hazard. However, the fact that it is called a cover implies that it is temporary or designed to be removed. Covers must be strong enough to support:

- at least two times the weight of workers or equipment that may cross it (**for Construction**) and
- at least three times the weight of workers or equipment that may cross it (**for General Industry**).

Covers must be secured in place so they don't slide or move and boldly marked "COVER" or "HOLE" so they aren't unintentionally removed.

CONTROLLED ACCESS ZONE:

Controlled access zones are used to restrict the access of workers to work areas not protected by a guardrail or safety net. The zone is set by a warning line or control line and can be used for leading edge work and certain overhand brick laying operations.

SAFETY MONITORING SYSTEM:

A system where a trained person monitors the workers exposed to the fall hazard. The trained person must be dedicated to the monitoring and cannot have any other duties. This system can be used for leading edge work, and work on low slope roofs. The safety monitor will be on the same working surface and within visual sighting distance of the employees be monitored.

Mechanical equipment will not be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-slope roofs.

WARNING LINE SYSTEM:

A warning line system consists of a rope, wire, or chain not less than 34 inches and nor more than 39 inches from working surface, supported on non-permanent stanchions and flagged at not more than six feet intervals with high-visibility materials. This system can only be used in conjunction with a controlled access zone, or a safety monitoring system. This system is only practical for use with leading edge work and on low slope roofs. When used with leading edge work, guardrails are built perpendicular to where the leading edge work is being done, and a warning line is run parallel to the leading edge between the guardrails. The area between the warning line and leading edge is considered a controlled access zone. On low slope roofs, a warning line can be used with a safety monitoring system. In this case, the safety monitor is crucial because there are no physical barriers to protect workers from falling.

FALL PROTECTION PLAN:

A Fall Protection Plan uses employee training as a substitute for physical fall protection. It can only be used for leading edge work, or precast concrete erection. It must be written, specific to each job site, address all of the potential fall hazards and a copy of the plan will be maintained at the job site. This system can only be used when it can be demonstrated that using a different system is infeasible or creates a greater safety hazard. EHS must be involved in evaluating the situation and developing the Fall Protection Plan.

PERSONAL FALL ARREST SYSTEMS:

A personal fall arrest system consists of a body harness, a shock-absorbing lanyard, lifeline or other rope-type device, and the hooks and rings needed to connect them. All hooks must be the locking type. Using a personal fall arrest system, a worker must be fully trained on how to wear, use and maintain the equipment and the limitations of the equipment. Always follow the manufacturer's instructions.

A body harness is designed to distribute the force of a fall across the whole body. Different brands have different fasteners and attachment rings. It is most important that the harness be fit and fastened correctly. Lanyards can be simple rope or strap arrangements with attachment hooks on the ends. Better designs include a deceleration device to help slow a fall and lower the trauma of an abrupt stop. Self-retracting lifelines are designed to engage a braking mechanism if the line is released too fast. It is most important that it be attached to something strong enough to absorb the full force of a fall without breaking. Horizontal lifelines, or static lines are often used along extensive lengths of leading edges; usually a heavy gage cable running the length of the leading edge so workers can tie off, but still move along the edge to work.

Once a worker has equipment and knows how to use it, they must learn the correct way to tie off. A personal fall arrest system is useless unless it is hooked to something that will stop a fall. Always try to tie off as high as possible. The higher the tie off, the shorter the fall. Tie off to something that will not cut the lanyard. Remember, if the worker does fall, they may be hanging and swinging for a while. If the lanyard is tied around something sharp, it may get cut before the worker is rescued. If the lanyard is looped around something and hooked to itself, make sure it won't slide or come loose.

POSITIONING DEVICES:

Positioning devices are devices that allow a worker to work on a vertical surface with both hands free. These devices can be used by workers doing concrete formwork and reinforcing steel work. To use this system, the worker must have a body harness or belt equipped with ring attachments on both hips. The worker ties off in two locations, one on each side, and leans back. *This is the only situation when a worker can use a body belt instead of a body harness*.

PROTECTION FROM FALLING OBJECTS:

When there is a falling object hazard from any elevated walking/working surface employees will wear head protection and one of the following techniques will be used to reduce the falling object hazard:

1. toeboards at least 3.5 inches high (installed on all elevated walking/working surfaces),
2. a canopy of sufficient strength to catch all falling objects (erected below all elevated walking/working surfaces),
3. or a barricade (built to keep employees out of the falling object hazard area).

WRAP-UP:

No matter what the situation or type of fall protection system selected, the duty to protect workers from fall hazards is continuous. Even if a standard guard rail system is used for all fall hazards, the guard rails must be built correctly, maintained, and observed by the workers. The best designed/built guard rail is useless if you're on the wrong side of it. Your first line of defense for protection from fall hazards is using your eyes (being observant) and brain (being prudent).

SUGGESTED DISCUSSION QUESTIONS:

1. At what height is fall protection required?
2. What are the three main types of fall protection?
3. What is the preferred type of fall protection?
4. What are some of the draw backs of safety nets and personal fall arrest systems?
5. Name three situations where special fall protection methods may be used?
6. Name five types of special fall protection methods?
7. When can a body belt be used for fall protection?
8. What type of hook should be on a lanyard?
9. Where should you tie off your personal fall arrest system?
10. What is your primary protection from fall hazards?