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Sample Fall Rescue Plan for Bridge Work

*This document is intended to provide guidance for developing fall rescue plans for bridge contractors. The Occupational Safety and Health Administration's (OSHA) regulation 29 CFR 1926.502(d)(20) states: "The employer shall provide for prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves." Employers should develop a site specific plan for rescue of workers who have fallen. Bridge contractors can consult American National Safety Institute/ American Society of Safety Engineers (ANSI/ASSE) Z359.2 (Minimum Requirements for a Comprehensive Managed Fall Protection Program) for additional information in developing a comprehensive fall protection plan. (A **Sample Fall Protection Plan for Bridge Work** is available from ARTBA.)*

(a) PURPOSE:

- (1) The purpose of this plan is to establish companywide guidelines for responding to a fall at heights of 6 feet and above. This plan should ensure that the victim's health risks are minimized during a fall. This plan also addresses the need to recognize the hazards of suspension trauma, how to prevent suspension trauma and how to treat suspension trauma. (A fact sheet on **Preventing Suspension Trauma** is available from ARTBA.)
- (2) The rescue plan shall ensure the rescuer(s) is/are protected by fall protection equipment 100% of time during the rescue attempt and that the rescue is conducted in a safe and professional manner.

(b) APPLICATION:

- (1) This plan will apply at all locations where personnel are employed.
- (2) The requirements of this plan are to be observed by all personnel involved in working at heights of 6 feet and above or where a fall hazard exists.
- (3) This plan shall be reviewed and/or included in any Activity Hazard Analysis (AHA) or Job Safety Analysis (JSA) when working at heights of 6 feet and above or where working above hazardous equipment regardless of fall height.

(c) DEFINITIONS:

- (1) **Rescue Plan** – A strategy or procedure, planned in advance, to retrieve safely a person who has fallen from an elevated work surface and is suspended in a full body harness, to include self-rescue or mechanically aided rescue.
- (2) **Self Rescue** – An act or instance of an employee using their fall protection and rescue equipment to perform a rescue without having to put other workers at risk.
- (3) **Mechanically Aided Rescue** – A strategy or procedure, planned in advance, to retrieve safely a person who has fallen from an elevated work surface using mechanical means.
- (4) **Suspension Trauma** – The medical effects of immobilization in a vertical position. The medical term is orthostatic incompetence or orthostatic shock.

(d) CONTRACTOR RESPONSIBILITIES:

- (1) **Employee** –
 - (i) Trained and familiar with the content of the company's Fall Protection Plan and policies.
 - (ii) Able to understand and evaluate the risks associated with working at heights.
 - (iii) Trained and competent in the use of fall protection equipment prior to working at heights.
 - (iv) Able to report unsafe conditions and/or behaviors to the Person-In-Charge.
 - (v) All employees utilizing fall protection equipment, including the designated competent person, lead rescuer and rescue personnel shall be trained in first aid, cardiopulmonary resuscitation (CPR), and suspension trauma (orthostatic incompetence or orthostatic shock).

(d) CONTRACTOR RESPONSIBILITIES (cont.):

(2) **Authorized Rescuer** –

- (i) Trained in rescue techniques by a competent rescuer trainer before exposed to a fall hazard or a potential rescue application.
- (ii) Shall be retrained when the nature of the work, the workplace, or the methods of control or rescue change to such an extent that prior training is not adequate.
- (iii) Training for authorized rescuers shall include physical demonstrations by trainees on how to inspect, anchor, assemble and use the fall protection and rescue equipment used in locations where they work.
- (iv) Training shall include at least the following:
 - Fall hazard recognition;
 - Fall hazard elimination and control methods;
 - Applicable fall protection and rescue OSHA regulations and consensus standards, such as but not limited to ANSI/ASSE Z359 series of standards;
 - How to use written fall protection and rescue procedures; and
 - Pre-use equipment inspection procedures.
- (v) Authorized rescuer update training shall be conducted at least annually to stay current with the fall protection and rescue educational requirements.
- (vi) Authorized rescuers shall be evaluated by a competent rescuer or competent rescue trainer at least annually to ensure competency of the duties assigned. Hands on performance evaluation will be conducted that covers all equipment that the person is authorized to use.
- (vii) The trainer will prepare a written certification record. The written certification record shall contain the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who was trained and the signature of the trainer. The latest training certification shall be maintained. (An **Employee Fall Protection Training Record** is available from ARTBA).

(3) **Competent Rescuer** –

- (i) Competent rescuers shall be trained by a competent rescue trainer.
- (ii) Training for competent rescuers shall include physical demonstrations by trainees on how to properly select, inspect, anchor, assemble and use the fall protection and rescue equipment used in locations where they work.
- (iii) Training shall include use of all types of equipment and systems used in locations where rescues may be required, including pre-use inspection procedures, installation, component compatibility, descent control devices, secondary rescue systems, packaging methods to minimize further injury, dismantling, storage and the common hazards associated with each system and component.
- (iv) Competent rescuer training shall include at least the following information:
 - Fall hazard elimination and control methods;
 - Applicable fall protection and rescue regulations;
 - Assessment of fall hazards to determine rescue methods;
 - Responsibilities of designated persons under OSHA Standards 29 CFR 1926 Subpart M (Fall Protection) and Subpart R (Steel Erection);
 - Detailed inspection and recording of rescue equipment components and systems;
 - Rescue systems assessment and determining when a system is unsafe;
 - Development of written fall protection rescue procedures; and
 - Selection and use of non-certified and certified anchorage points.
 - First aid, CPR and recognition and treatment of suspension trauma (Orthostatic Incompetence).
- (v) Competent rescue training shall be conducted at least annually.

(e) PROCEDURE:

(1) A rescue plan must be a part of the Activity Hazard Analysis (AHA) or Job Safety Analysis (JSA) for any job that is to be performed that requires work at heights at or above 6 feet. In all cases where an employee falls and rescue procedures must be implemented call 911. Ensure that the fire department and Emergency Medical Service (EMS) responders are informed that suspension trauma may be involved with the rescue. Initially after a fall that is arrested by fall protection equipment, the fallen worker may appear to have suffered no injury. Often, internal injuries may not be immediately apparent but may be fatal if not medically treated properly. The rescue plan shall include consideration of the following rescue types and circumstances:

(i) **Self-Rescue:** If the competent person supervising those working at heights makes proper choices in the equipment to be used and the worker uses the equipment properly, then 90% of fallen workers will be able to perform self-rescue which should include:

- Worker will climb back up to the level from which they fell. The worker will usually use an extension ladder to climb back to the bridge deck or surface from which they have fallen.
- Worker will return to the bridge deck, ground, or other surface and receive prompt medical care and evaluation.
- Site management will remove all necessary components of the worker's fall arrest system from service and document (bag/tag) the components involved in the fall with the name, date, and activity at the time of the fall and give it the appropriate level of management to conduct an accident investigation.

(ii) **Assisted Self-Rescue:** Assisted Self-Rescue with mechanically aided hauling/rope system that is manually operated. The goal of the assisted self-rescue is for the fallen worker to perform as much of the rescue as possible with assistance. Therefore, if self-rescue is not possible then the worker must be safely retrieved by the use of an assisted self-rescue system which uses a manual mechanical advantage for a hauling/rope system. The following guidelines should be used during a manual mechanically aided rescue:

- The static load requirements: The mechanical device may be secured to a non-certified anchor that is rated for at least 3,000 lbs. (13.3kN) or to a certified anchorage of five times the applied load.
- The haul line may be swung over or lowered to the worker, who will grab the lifeline hook and secure it to the appropriate body support D-ring. As a general rule it is not recommended snapping two snap hooks from separate fall protection equipment into the same D-ring. The front D-ring may be also be used to attach to the haul line. In self-rescue the front D-ring may give the fallen employee greater control staying away from fixed objects in front of them. Before releasing the lanyard or self-retracting life line that arrested the worker's fall, the lead rescue member, all rescue personnel involved in the rescue and the employee (if capable) must all verify that a secondary fall protection or haul line used with a self-retracting lifeline (SRL) has a positive connection. Verification of positive connection to the haul line may be made by the worker hoisting themselves up where the arrest lanyard or SRL is visibly slack. Once all involved have verified a positive connection to the rescue equipment, the lead member of the rescue team may order releasing the lanyard or self-retracting life line that arrested the worker's fall.
- If possible, the fallen worker will raise or lower themselves to the appropriate work platform or ground. If the fallen worker cannot raise or lower themselves, then a member of the rescue team must raise or lower the fallen worker to the platform or ground. After the employee has been rescued from their arrested fall, the employee will receive prompt medical attention for all serious injuries, including treatment for possible suspension trauma. (A fact sheet on **Preventing Suspension Trauma** is available from ARTBA.)
- Site management will remove all necessary components of the workers fall arrest system from service and document (bag/tag) the components involved in the fall with the name, date and activity at the time of the fall and give it the appropriate level of management to conduct an accident investigation.

(iii) **Mechanically Aid Assisted Rescue:** Rescue with manual mechanically aided hauling/rope system by a rescue team member(s). If the workers injuries prevent them from attaching themselves to the rescue system, both self-rescue and assisted self-rescue are not options, and a fully assisted rescue must be performed.

(e) PROCEDURE (cont.):

- The static load requirements: The mechanical device will be secured to a non-certified anchor that is rated for at least 3,000 lbs. (13.3kN) or to a certified anchorage of five times the applied load.
- A rescue team member must attach the mechanical device haul line to the fallen worker's fall arrest system. This can be performed by accessing the worker and attaching to the worker's harness or use a rescue pole for the attachment. The rescue team could also attach a rescue grab to the lanyard or vertical lifeline.
- The rescue team will raise or lower the fallen worker to the appropriate work platform or ground. After the employee has been rescued from their arrested fall the employee will receive prompt medical attention for all serious injuries, including treating for possible suspension trauma.
- Site management will remove all necessary components of the worker's fall arrest system from service and document (bag/tag) the components involved in the fall with the name, date, and activity at the time of the fall and give it to the appropriate level of management to conduct an accident investigation.

(iv) **Aerial Work Platform Assisted Rescue:** Rescue with mechanically aided aerial work platform. Another means to perform an assisted rescue is with an aerial work platform using the following guidelines:

- At least one rescue worker who has been trained to safely operate the aerial work platform will get into the aerial lift and make sure there is a second fall protection device such as a shock absorbing lanyard or SRL available for the fallen worker who is being rescued.
- The aerial lift will be maneuvered into position and then raised up under the worker to be rescued.
- The rescue worker will attach the second lanyard or SRL from the aerial work platform to the fallen worker to be rescued.
- Before releasing the lanyard or self-retracting life line that arrested the worker's fall, the lead rescue member and all rescue personnel involved in the rescue and the fall victim (if capable) must all verify that a positive connection from the aerial work platform to the fall victims harness. The rescue worker after receiving permission from the lead rescue worker, may disconnect the lanyard or SRL involved in arresting the worker's fall.
- Lower the worker to the ground. After the employee has been rescued from their arrested fall the employee will receive prompt medical attention for all serious injuries, including treating for possible suspension trauma.
- Site management will remove all necessary components of the workers fall arrest system from service and document (bag/tag) the components involved in the fall with the name, date and activity at the time of the fall and give it to the appropriate level of management to conduct an accident investigation.

NOTE: OSHA states that fall protection equipment is not required when working over water. When working over or near water, the requirements of 29 CFR 1926.106 apply. Employees working over water and exposed to fall hazards should be provided a fall protection harness and a personal flotation device (PFD). For comfort the employee should be provided a combination harness/PFD. The employer should evaluate on a case-by-case basis if only a PFD will be utilized over water and that the employees will not use or be required to use fall protection equipment as well. When working on a high bridge with a significant fall hazard employees should be utilizing fall protection. The fall impact forces to water from a high bridge could be severe enough to cause death.

(v) **Mobile Crane Supported Platform Assisted Rescue:** Rescue by use of a personnel platform attached to mobile crane. Another means to perform an assisted rescue is with a personnel platform suspended by a crane using the following guidelines:

- The crane operator must be trained to perform crane operations using a personnel platform for rescue of a fallen worker.
- The employer and the crane operator must ensure that the crane, the personnel platform, and fall protection required is in accordance with OSHA Crane Standard in 29 CFR 1926.1431.
- If the employer anticipates the possible need to use a personnel platform suspended by a crane to rescue a potential fall victim, the crane operator and the rescue team will perform a trial lift prior to worker exposure to a fall hazard. All rescue equipment and the personnel platform must be in the ready position to be attached and suspended by the crane to perform the rescue in a timely manner.

(e) PROCEDURE (cont.):

- At least one rescue worker will get onto the personnel platform and make sure there is a second fall protection device such as a shock absorbing lanyard or SRL available for the fallen worker who is being rescued.
- The crane will be maneuvered into position and then raised up under the worker to be rescued in the same manner as the trial lift.
The rescue worker will attach the second lanyard or SRL from the aerial work platform to the fallen worker to be rescued.
- Before releasing the lanyard or self-retracting life line that arrested the worker's fall, the lead rescue member and all rescue personnel involved in the rescue and the fall victim (if capable) must all verify a positive connection from the personnel platform anchorage point to the fall victims harness. The rescue worker after receiving permission from the lead rescue worker may disconnect the lanyard or SRL involved in arresting the worker's fall.
- Lower the worker to the ground. After the employee has been rescued from their arrested fall the employee will receive prompt medical attention for all serious injuries, including treating for possible suspension trauma.
- Site management will remove all necessary components of the workers fall arrest system from service and document (bag/tag) the components involved in the fall with the name, date and activity at the time of the fall and give it to the appropriate level of management to conduct an accident investigation.

NOTE: OSHA states that fall protection equipment is not required when working over water. When working over or near water, the requirements of 29 CFR 1926.106 apply. Employees working over water and exposed to fall hazards should be provided a fall protection harness and a personal floatation device (PFD). For comfort the employee should be provided a combination harness/PFD. The employer should evaluate on a case-by-case basis if only a PFD will be utilized over water when working from an aerial lift or suspended by a crane. When working on a high bridge with a fall hazard of 40 feet or more to the water fall protection must be utilized. A fall from a high bridge to water can result in severe injury and may be fatal. OSHA states a PFD alone is not adequate if the height of the potential fall is 40 or more feet or there is a potential of striking a structural member during the fall or striking something floating in the water. In these cases the employee must be tied off.

(vi) **Crane as an Anchorage Point:** Anchoring to the load line of a crane. When using the load line of a crane as an anchorage point ensure compliance with OSHA Standard 29 CFR 1926.1423(g), (j) and (k) is mandatory. Personal fall arrest system or rescue equipment for fall arrest is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met:

- A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging) meets or exceeds the requirements of a 5,000 lbs. (22.2 kN) anchorage point per employee attached. If one rescue worker and one employee to be rescued are secured to the hook, load line or rigging than the rated capacity for the crane at the radius and angle of the boom must exceed 10,000 lbs. (44.4 kN) on the load chart for the crane.
- The crane operator must be at the work site and informed that the equipment is being used as an anchorage point for fall protection or for fall rescue equipment.
- No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).
- **Training.** The employer must train each employee who may be exposed to fall hazards while on, or hoisted by, equipment covered by OSHA's crane standard on all of the following: The requirements of this rescue plan and OSHA's fall protection standard.

(f) ANCHORAGE POINTS (ANSI/ASSE Z359.2 Section 5.4):

Strict Load Requirements		
	Non-Certified	Certified
Fall Arrest System	5,000 lbs. (22.2kN)	2 X maximum arresting force
Work Positioning Systems	3,000 lbs. (13.3 kN)	2 X foreseeable force
Restraint & Travel Systems	1,000 lbs. (4.5 kN)	2 X foreseeable force
Rescue Systems	3,000 lbs. (13.3 kN)	5 X applied load
Horizontal Lifeline Systems	Must sustain at least two times the maximum tension developed in the lifeline during fall arrest in the direction applied by lifeline forces.	

(g) ASSEMBLY, MAINTENANCE, INSPECTION, DISASSEMBLY PROCEDURES

Assembly and disassembly of all rescue and equipment will be done according to manufacturers' recommended procedures. A copy of the manufacturer's product manuals for each type of rescue and fall equipment used will be on-site.

A site specific list of rescue and fall equipment used on this job will be developed by site management. Rescue personnel will conduct a visual inspection of all rescue and fall protection equipment daily or before each use. Any defective rescue and fall protection equipment will be tagged and removed from service immediately. The manufacturer's recommendations for maintenance and inspection will be followed.

(h) FALL PROTECTION ENFORCEMENT/DISCIPLINARY POLICY

Describe and insert the company policy for fall protection enforcement and disciplinary actions that will be taken for violators. Managers (superintendents, foremen, competent persons, and qualified persons) must understand if they knowingly violate the company's policy they will be terminated. Employees must understand if they knowingly violate the company's policy of fall protection they will be terminated as well. The company's enforcement and disciplinary policy should address actions that will be taken against sub-contractors as well. The company should have only two choices for violations of fall protection policies: termination for knowingly violating company's fall protection policy or retraining with a written counseling statement.

(I) REFERENCES TO ANSI / ASSE Z359 FAMILY OF CONSENSUS STANDARDS

The following five ANSI/ASSE Z359 series of consensus standards provides for a "systems approach" to implementation of a fall protection program:

Z359.0	Definitions and Nomenclature Used for Fall Protection and Fall Arrest
Z359.1	Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
Z359.2	Minimum Requirements for a Comprehensive Managed Fall Protection Program
Z359.3	Safety Requirements for Positioning and Travel Restraint Systems
Z359.4	Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components

(J) AUTHORIZATION:

Signature: _____

Date: _____

Name: _____

Title: _____

NOTE: Company's fall protection policy should be signed by the highest level of management within the company.

Sample Rescue Plan

IMPORTANT: This document is intended to provide guidance only for developing site-specific working at heights rescue plans for bridge contractors.

Date: _____ Job Description: _____

Title	Name	*Method of Contact
Designated Competent Person		
Lead Rescue Person		
Assistant Rescuer(s)		
Emergency Contact(s)		

*Denotes: Verbal (Face-to-face), Radio Channel (specify channel), phone number or other forms of communication.

Onsite Rescue Equipment (indicate a yes or no for each box)

	Ladder		Pulley System
	Rescue Pole		Brake-Tube System
	Rescue Rope		Winch System
	Crane as Anchorage Point		Controlled Descent
	Crane with a Personnel Platform		Rope Ladder
	Scaffold		Skiff
	Aerial Work Platform		Life Ring with 90 feet of rope
	Vertical Rescue & Escape System		First Aid Kit
	Self-Retractable Lifeline		Stokes basket

Pre-Planning for Rescue and Fall Protection Equipment

Yes/No	Rescue and Fall Protection Planning	Comments
	Have alternatives to using fall arrest equipment been considered?	
	Has rescue equipment been inspected and found in serviceable condition?	
	Is equipment adequate for the rescue plan?	
	Have communications devices been identified, located, and tested?	
	Are all rescuers familiar with the use of the rescue equipment?	
	If working over water, is there a skiff and life rings?	
	Are PFDs worn by worker when working over water?	
Describe tasks to be done prior to work to prevent a fall and the step-by-step process to be followed in the event of a fall.		

Pre-Work Tasks and Response Procedures

#	Pre-Work Task	#	Response Procedure
1	AHA (Activity Hazard Analysis) and/or JSA (Job Safety Analysis) has been developed for this task	1	Call 911
2	Perform trial test of rescue equipment	2	Notify Emergency Fall Rescue Team
3		3	Notify First Aid/CPR Personnel
4		4	Notify Site Management
5		5	
6		6	

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