



## FALL PROTECTION - HORIZONTAL LIFELINES



# STANDARD OPERATING PROCEDURE **FALL PROTECTION** **Horizontal Lifelines (HLL)**

Kiewit Bridge and Marine		
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## 1.0 PURPOSE


The objective of this SOP is to identify the critical aspects to consider when planning to use a horizontal lifeline (HLL) on your work. This SOP differs from most that you are familiar with - in that this SOP does NOT provide a standardized procedure for HLL utilization. It is written to ensure the proper fall protection plan is selected and that best practices are followed when implementing HLLs.

## 2.0 WORK SCOPE

The scope includes selecting, setting up, inspection and safely using a horizontal lifeline. It also includes guidelines and tips pertaining to correctly completing the standardized fall protection permit. The use of this SOP assumes that the operation has been evaluated thoroughly, and it has been determined that an HLL fall protection permit is necessary to perform the work. If other forms of fall protection will be used with an HLL, refer to their respective [SOPs](#) and follow those procedures as well.

## 3.0 DEFINITIONS / ACRONYMS

**\*ALL FALL PROTECTION COMPONENTS MUST BE DOMESTIC MADE**

TERMS / ACRONYMS	DEFINITION
Back Stay	The line that keeps tension on the Main Line
Crosby Clip	Cable clip used on the lines 

<p><b>Fist Grip</b></p>	<p>Cable clip used on the lines</p> 
<p><b>Main Line</b></p>	<p>The line in which you will be tied off to.</p>
<p><b>Pork Chop</b></p>	<p>Aircraft cable tensioner</p> 
<p><b>Zorbit</b></p>	<p>HLL Energy Absorber</p> 



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<b>Corporate Standard Definitions</b>	<a href="https://portal.kiewit.com/sites/KiewitSafety/Lists/Glossary/AllItems.aspx">https://portal.kiewit.com/sites/KiewitSafety/Lists/Glossary/AllItems.aspx</a>
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### 4.0 ROLES AND RESPONSIBILITIES

POSITION	ROLE AND RESPONSIBILITY
<b>DESIGNATED SIGNER</b>	<ul style="list-style-type: none"> <li>• Must review and approve <b>every</b> fall protection permit on their project.</li> <li>• Designated by district leadership and assigned on the TSCD matrix.</li> </ul>
<b>DESIGNATED INSPECTOR</b>	<ul style="list-style-type: none"> <li>• Responsible for initial inspection of fall protection systems to ensure correct installation.</li> </ul>
<b>PROJECT MANAGER</b>	<ul style="list-style-type: none"> <li>• Oversee implementation of fall protection program.</li> <li>• Ensure employees are trained and understand the fall protection requirements.</li> </ul>
<b>GENERAL SUPERINTENDENT</b>	<ul style="list-style-type: none"> <li>• Review, approve fall protection permits.</li> <li>• Ensure the fall protection hierarchy of controls is followed.</li> <li>• Ensure the fall protection permit is complete with all supporting documents attached.</li> </ul>
<b>SUPERINTENDENT</b>	<ul style="list-style-type: none"> <li>• Develop the fall protection permit with the goal of eliminating fall risk by following the hierarchy of controls (eliminate, prevent, restrain, arrest, administrative).</li> <li>• Verify the craft have appropriate training, understand the plan/permit.</li> <li>• Verify the permit is being adhered to in the field.</li> <li>• Ensure all approvals are obtained.</li> <li>• Ensure the team is trained on the inspection process and it is being tracked.</li> <li>• Confirm rescue equipment is available.</li> </ul>
<b>FIELD ENGINEER</b>	<ul style="list-style-type: none"> <li>• Participate in development of the fall protection permit.</li> <li>• Confirm fall distance vs fall clearance required.</li> <li>• Verify that the crew has the correct fall protection equipment.</li> <li>• Track and document all fall protection equipment and device inspections.</li> <li>• Verify the permit is being adhered to in the field.</li> <li>• Confirm rescue equipment is available.</li> </ul>
<b>FOREMAN</b>	<ul style="list-style-type: none"> <li>• Participate in the development of the fall protection permit.</li> <li>• Verify the permit is being adhered to in the field.</li> <li>• Ensure all craft employees working on the permit are properly trained to utilize their fall protection equipment and devices.</li> </ul>



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	<ul style="list-style-type: none"><li>• Review fall protection permit with crew prior to task and confirm signed off.</li><li>• Confirm rescue equipment is available.</li></ul>
<b>CRAFT</b>	<ul style="list-style-type: none"><li>• Follow the fall protection permit being utilized in the field.</li><li>• Only use fall protection equipment you have been trained to use.</li><li>• Inspect all fall protection equipment and devices prior to every use.</li></ul>

### 5.0 PROCEDURE

- 5.1 Decide what, specifically, you will be using to secure the HLL based on the operation's site-specific conditions (ie. Tie off between two columns, girders, improvised anchorage points, rebar cages).
  - 5.1.1 NOTE: KIE review/design is required for ALL HLL systems.
  - 5.1.2 Select SRL based on max arrest force and number of users per span on HLL.
    - 5.1.2.1 MUST be equal to or less than MAF of the HLL (See REFERENCES).
    - 5.1.2.2 If more than one SRL may be utilized, choose the worst-case option for calculations.
    - 5.1.2.3 All SRLs must be Leading Edge rated.
    - 5.1.2.4 **NOTE: You can NOT use the Smart Lock SRL, Ultra-Lok LE, or Protecta Cable 50' & 66' with any SecuraSpan or Reliance HLLs.**
- 5.2 Obtain the following values from the respective manufacturers' user manuals (See REFERENCES)
  - 5.2.1 Fall Clearance Calculations (See HLL Permit Examples)
  - 5.2.2 HLL Maximum Arrest Force - Dependent on the design of the system
  - 5.2.3 HLL Maximum User Weight
  - 5.2.4 HLL Maximum Number of Users
  - 5.2.5 HLL Maximum allowable horizontal distance from anchorage
  - 5.2.6 HLL Sag
  - 5.2.7 SRL Maximum Arrest Force
  - 5.2.8 SRL Maximum User Weight
  - 5.2.9 SRL Maximum Number of Users
  - 5.2.10 SRL Maximum allowable horizontal distance from anchorage
  - 5.2.11 If kneeling, add 3' 3" (1m) to the fall distance
  - 5.2.12 Swing fall – Using the above data, ensure workers cannot reach any objects during a swing or that additional safeguards are in place to prevent a swing-related incident
  - 5.2.13 Always measure to the worst-case scenario



### 6.0 Important Considerations

- 6.1 How will your crew be accessing the working location (ladder, stair tower, transfer at heights, manlift/boom lift)? [See applicable SOP].
- 6.2 Remember, fall distance is measured to the nearest obstruction.
- 6.3 Is the fall clearance constant across the whole working area?
  - 6.3.1 If not, you may need to employ multiple systems to maintain the fall clearance requirement.
- 6.4 How many people can be tied off at one time? (Dictated by manufacturers' instructions or the max arrest force of the HLL or combined max arrest forces of the SRL(s) - whichever is more conservative).
- 6.5 What is the Swing Fall, if any? Can it be eliminated, and did we account for it in our fall protection permit?
- 6.6 See Examples of HLL Systems for previously used fall protection systems. There is not a "one size fits all" plan for HLLs, but you do not need to reinvent the wheel every time.
- 6.7 If multiple fall protection systems are required, follow the Fall Protection Permit SOP for all systems, respectively. Each system will most likely require its own permit.

### 7.0 Horizontal Lifeline Inspection

- 7.1 A red tag will be placed on HLL system until inspected by a competent person.
  - 7.1.1 A green tag will be placed on the system once inspected and approved for use.
- 7.2 [HLL and TSCD Anchorage Inspection SOP](#)



### 8.0 REFERENCES

- **Fall protection polices, forms (permits), SOP's, trainings etc.**
  - [Kiewit Fall Protection Document Resources](#)
- **Kiewit TSCD Manual, Corporate Memos, and HLL Inspection Checklist Example**
  - [Fall Protection MEMO-TSCD-INSPECTION](#)
- **Past HLL Systems on Kiewit Jobs**
  - [Example of HLL systems](#)
- **Manufacturers' Guides and Instructions**
  - [SecuraSpan HLL User Instruction Manual - I Beam Stanchion](#)
  - [SecuraSpan HLL User Instruction Manual - Perpendicular I-Beam Stanchion](#)
  - [SecuraSpan HLL User Instruction Manual - Rebar / Shear Stud Stanchion](#)
  - [SecuraSpan HLL User Instruction Manual - Loop Rebar Stanchion](#)
  - [SecuraSpan HLL User Instruction Manual - Pour-in-Place](#)
  - [Nano-Lok SRL Instruction Manual](#)
    - [Nano-Lock Edge SRL Fall Clearance Calculator](#)
  - [UltraLok SRL Instruction Manual](#)
  - [Ultra-Lok SRL Instruction Manual \(additional model numbers\)](#)
  - [Rebel SRL-LE Instruction Manual 6ft](#)
  - [Rebel SRL-LE Instruction Manual 10ft, 11ft, 20ft](#)
  - [Smart Lock SRL-LE Instruction Manual](#)