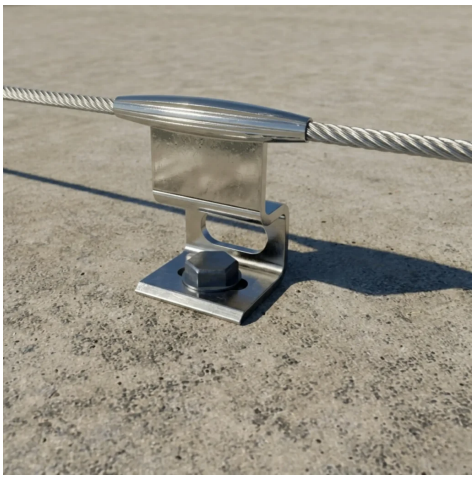
HORIZONTAL LIFELINE ON CONCRETE STRUCTURE

TECHNICAL SPECIFICATION

GROXXGEARS.COM

Fall Arrest System - Product Catalog, Horizontal Lifeline - Product Catalog, Lifeline Configurations - Product Catalog

GROXX HORIZONTAL LIFELINE SYSTEM | CONCRETE SLAB APPLICATION



STRUCTURAL ENGINEERING & OPERATIONAL MECHANICS

The **Groxx GRXHLLC** Horizontal Lifeline system for concrete substrates is a professional-grade fall-arrest solution that converts rigid reinforced concrete into a dynamic safety anchorage. The system is specifically engineered to manage high-velocity kinetic energy while maintaining the structural integrity of the slab.

1. PRIMARY STRUCTURAL INTERFACE: CHEMICAL ANCHORAGE

The reliability of the GRXHLLC system begins with the interface between the **G-Anchor Extremity Posts** and the concrete slab.

- **Substrate Requirement:** Installation is typically performed on reinforced concrete with a minimum compressive strength of 25 MPa (C20/25).
- **Fixing Mechanism:** Utilizing **GRX851 Modified Epoxy Resin** and **GRXNG143 SS316 Threaded Bolts**.
- **The "Bond" Logic:** Unlike mechanical expansion anchors that rely on friction and induce internal "bursting" stresses (limiting edge distance), the GRX851 chemical anchor creates a tension-free molecular bond. The epoxy penetrates the concrete pores, distributing the load across the entire surface area of the drilled hole (10d–15d depth). This allows for maximum pull-out resistance even in cracked concrete zones.

2. KINETIC ENERGY MANAGEMENT (THE LOAD PATH)

Concrete is a high-modulus, non-yielding material. In a fall event, the system must prevent the "impact spike" from reaching the user or the anchors.

- **Stage 1: Inline Energy Absorption:** The system incorporates a high-capacity 316 Stainless Steel Energy Absorber. Upon reaching a pre-defined trigger force, the absorber undergoes controlled deformation (unfolding), which extends the deceleration distance and caps the Maximum Arrest Force (MAF) to safe levels (typically <6kN).
- **Stage 2: Cable Span Deflection:** The 8mm 7x19 wire rope acts as a flexible spring. The horizontal tension and the "sag" (deflection) during a fall absorb a significant portion of the energy before it reaches the extremity G-Anchors.

3. SYSTEMATIC PASS-THROUGH TECHNOLOGY

Continuous protection is maintained through the engineering of the **Intermediate Supports** and the **Traveler Shuttle**.

- **Continuous Tie-Off:** The traveler shuttle features a unique "gated" geometry. As the user moves along the slab, the shuttle passes over intermediate supports without manual disconnection.
- **Bypass Geometry:** The intermediate supports hold the cable in a way that leaves the top and bottom of the cable profile accessible to the shuttle's tracking wheels/jaws, ensuring 100% connectivity across the entire length of the slab.

4. TECHNICAL COMPONENT MATRIX

COMPONENT	ENGINEERING FUNCTION	MATERIAL SPECIFICATION
G-Anchor Post	Primary structural termination / Extremity load-bearing	AISI 316 Stainless Steel
GRX851 Adhesive	Load transfer via chemical molecular bonding	Two-Component Modified Epoxy
8mm Wire Rope	Flexible lifeline member (100% bypass compatible)	SS316 7x19 Construction
Inline Absorber	Dynamic force reduction / Energy dissipation	SS316 with Tear-Webbing / Coil
Intermediate Support	Cable management / Multi-span stabilization	SS316 Low-Profile Design

5. COMPLIANCE & CERTIFICATION

The **GRXHLLC** system is engineered and tested to meet the following safety benchmarks:

- **EN 795:2012 Type C:** European standard for anchor devices using flexible anchor lines.
- **CEN/TS 16415:2013:** Multi-user testing requirements, certifying the system for use by multiple workers simultaneously (refer to specific system layout for user limits).

- **ISO 9227:** High-level salt spray testing for corrosion resistance, ensuring longevity in coastal concrete installations.