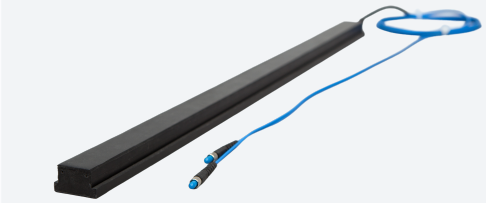
SL EZ Frame Installation Guide

Quarterhill road-traffic products, fiber-optic sensors



Filler Material and Preliminary Requirements

Use a cement or polymer-based filler suitable for road reconstruction. Common examples include Pagel® V2/40, FlexKrete™ 102, and SikaGrout® 214.

Before starting:

- Read the full application instructions and safety information for the chosen filler material.
- Keep the filler within the manufacturer's recommended temperature range so it develops full strength and flows properly.
- For cement-based fillers, bring the concrete surface (slot walls and bottom) to a saturated surface dry (SSD) condition before installation.

Safety and Preparation

Assemble all tools and materials, confirm that safety equipment is available, and confirm that operators are trained in the use of the power tools required.

Installation Procedure

1. **Mark the location.** Mark the cut at least 30 mm wider than the width and length of the ordered frame. Mark the conduit location at the same time.
2. **Excavate.** Cut the opening at least 65 mm deep over the entire area. Make multiple parallel cuts so that no remaining concrete is wider than 25 mm at any point. Excavate for the conduit and use a jackhammer to reach the minimum 65 mm depth.
3. **Remove Debris.** Clean out all rubble with a wire brush and vacuum all dust thoroughly.
4. **Prepare the surface (cement-based fillers).** Keep the concrete surface (slot walls and bottom) wet and fully water-saturated at all times until installation is complete. Do not leave standing water or puddles in the slot.

5. **Place the frame.** Set the SL EZ into the slot and confirm at least the recommended clearance around it. Protect the feeder cables from bending and contamination.
6. **Assemble and position the hanger bars.** Mount the SL EZ to the hanger bars and position them next to the slot (see Preparing Hanger Bars, below).
7. **Install the fiber cable.** Feed the fiber cable carefully through the conduit to the booth. Do not pull it by the end connectors. Verify sensor integrity: remove both end caps, point one connector toward a light source, and confirm light is visible at the opposite connector. If damage is suspected, replace the connectors with the Termination Kit and retest.
8. **Prepare the filler.** Mix the mortar according to the manufacturer's instructions, measuring precisely.
9. **Fill the base.** Fill the bottom of the slot with fluid mortar to 40 mm below the road surface.
10. **Position the frame over the mortar.** Lower the hanger-bar assembly with the SL EZ over the slot so that the SL EZ bottom is fully embedded in mortar and sits at an even height across the entire slot length. The hanger bars set the correct level to the road surface. Load the hanger bars to prevent the SL EZ from floating, as it is lighter than the filler material. The finished surface should align with the pavement level.
11. **Place the cable and seal the slot.** Set the cable in its final position and seal the slot or conduit with assembly foam or another sealing material so cement cannot seep out.
12. **Complete the fill.** Fill all remaining space with mortar up to the road surface.
13. **Trowel the surface.** Wait until the mortar has hardened enough to trowel. Do not remove excess mortar; keep enough to maintain bonding between the road, the grout, and the SL EZ.
14. **Remove the hanger bars.** Remove the hanger-bar assembly only after the filler has cured enough to hold the SL EZ in place. Finish the surface by troweling the mortar smooth.
15. **Cure.** Allow the mortar to harden fully per the filler instructions. For cement-based fillers, protect the mortar from direct sunlight and keep it wet.
16. **Drill the anchor holes.** Drill 10 mm diameter holes through the 16 mm frame holes in the SL EZ, using a hammer drill and concrete bit. The holes should be at least 170 mm deep below the top of the frame. Clear all debris with compressed air or a vacuum.
17. **Install the road anchors, Method A (bolts).** Insert a road anchor with a V2A washer and snap ring from the Bolt Set into each hole, placing the snap ring between the washer and the bolt head. Optionally, use concrete screw mortar to increase tensile load.

17. **Install the road anchors, Method B (threaded rods).** Alternatively, fix threaded steel rods in the concrete base with epoxy and secure the SL EZ with a nut, leaving about 10 mm of clearance to the SL EZ surface for the covering cap.
18. **Tighten the bolts.** Fix all bolts with an impact wrench.
19. **Seal the holes.** Cap all holes with the caps from the Bolt Set.
20. **Extended cure (cement-based fillers).** Keep the mortar continuously wet for at least 3 to 5 days, or the cement will crack.

Preparing Hanger Bars

Hanger-bar constructions are not supplied by Quarterhill; the installer assembles them at each borehole line. Several materials and designs can be used.

Use M16 screws and nuts to fix the SL EZ below the hanger bars. After removing the hanger screws, drill and screw the road anchors directly through the M16 nut positions. For thinner screw applications, use plastic nuts instead. Clean each drilled hole thoroughly before fixing the screw.

Tools & Materials

Category	Items
Marking & Cutting	Road chalk or spray paint; road saw with a narrow blade
Excavation	Electric or small pneumatic jackhammer
Cleaning	Wide brush; vacuum cleaner
Conduit & Cabling	Conduit with at least 20 mm inner diameter; Termination Kit
Sealing & Grouting	Assembly foam or other sealing material; required quantity of mortar; scales or measuring container; at least one bowl and several buckets; heavy-duty slow-speed electric drill with mixing paddle; smoothing trowels and spatulas
Positioning & Anchoring	Hanger-bar construction with distance holders; M16 screws and nuts; weights to hold the hanger bars to the road; hammer drill with 10 mm concrete bit; impact wrench with 17 mm metric socket; Bolt Set

Key Specifications

Specification	Value
Minimum Opening Width	30 mm wider than the frame
Minimum Excavation Depth	65 mm
Maximum Remaining Concrete Between Cuts	25 mm
Initial Mortar Fill Height	40 mm below the road surface
Anchor Hole Diameter	10 mm
Anchor Hole Depth	At least 170 mm below the top of the frame
Threaded-Rod Clearance	About 10 mm to the frame surface
Hanger-Bar Screw Size	M16
Impact Wrench Socket	17 mm metric
Conduit Inner Diameter	At least 20 mm
Minimum Cement Cure	3–5 days, kept continuously wet

Handling and Safety Notes

- Do not use filler materials outside their recommended temperature range.
- Do not bend or contaminate the feeder cables during installation.
- Do not pull the fiber cable by its end connectors when feeding it through the conduit.
- Do not remove excess mortar during troweling; keep enough to maintain bonding.
- Do not remove the hanger bars until the filler has cured enough to hold the SL EZ.
- For cement-based fillers, keep the surface continuously wet for 3 to 5 days to prevent cracking.
- Verify connector integrity after cable installation and replace with the Termination Kit if damaged.