


# Saw-cut repair and utility-trench reinstatement

STANDARD OPERATING PROCEDURE · LL-TEQ™ SYSTEM · COLD IN-PLACE PROCESS

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STANDARD OPERATING PROCEDURE (SOP)

# Saw-cut repair and utility-trench reinstatement

LL-TEQ™ system — LL30 / LL25 treated pavement · cold in-place process · LL30 (structure) + in-situ material + LL25 (sealing layer)

**REFERENCE**

LLTEQ-SOP-TRN-052026

**REVISION**

Rev. B — May 2026

**PROCESS**

Cold in-place — saw-cut & trench reinstatement

**COMPONENTS**

LL30 (structure) + in-situ material + LL25 (sealing)

Method for **localized saw-cut repair** and **utility-trench reinstatement** in pavement treated with the LL-TEQ™ system, using a cold in-place process with standard road equipment.

The process applies to municipal and utility interventions (water, sewer, telecommunications, electricity, gas) that require opening and then reinstating an existing LL-TEQ™ pavement.

#### Key requirement

Purge down to sound material across the full depth of the LL30 layer (**50 to 200 mm** depending on the project), reinstatement with LL30 in the replacement material, compacted to **95 %+**, then surface sealing with **LL25** overlapping onto the adjacent intact surface.

#### Scope

This document describes the repair and reinstatement method. Structural design, any subgrade repair, drainage, and the work-acceptance criteria are the responsibility of the **project designer and the supervising authority**, not of LL-TEQ™. **No specialized equipment or mechanical reinforcement (dowels, anchor bars) is required** beyond standard road equipment (see §4).

A frequent question from engineers accustomed to concrete: do LL-TEQ™ repair joints need dowels or anchor bars, as in concrete (PCC) slab repair?

**Answer: no.** The rationale is as follows:

- Concrete slabs are rigid floating structures; a repair joint creates a permanent structural discontinuity. Load transfer depends on dowels precisely because no material continuity is re-established at the joint.
- LL-TEQ™ is not a floating surface. LL30 is a monolithic stabilized layer across the full integration depth (50 to 200 mm depending on the project). Unlike rigid concrete, which requires expansion joints for thermal expansion/contraction, the ductile behaviour of LL30 absorbs thermal deformation without creating a discontinuity.
- A reinstated section recovers its structural continuity through the same material-integration mechanism that produced the original treated layer.
- **Supporting data:** the compressive strength of LL30 reaches **1,625 PSI (11.2 MPa)** on sand-clay stabilized at 4 %, more than double the same substrate stabilized with 8 % Portland cement (804 PSI / 5.5 MPa) — ASTM C39/C42, S.A.M Consultants 2016. The full structural characterization (UCS, lab-field correlation) is covered in evidence exhibit PRV-01; the structural coefficient  $a_2$  is covered in datasheet EQV-04.

## Conclusion

Load-transfer devices (dowels, anchor bars) are therefore **not technically justified** within this protocol. This configuration — a continuous LL30 layer placed in a single process, without mechanical devices — has been deployed and accepted under U.S. military pavement standards (see §3).

The LL-TEQ™ system has been deployed and operationally accepted as a continuous LL30 layer, without load-transfer devices, under U.S. military pavement standards (PCASE 2.09; UFC 3-260-01; TM 5-822-14 / AFJMAN 32-1019; ETL 97-9).

The aircraft loads documented on these deployments (C-17, C-130, KC-130J) exceed by a substantial margin any gross load permitted on Québec municipal roads for highway vehicles. Detailed records, allowable capacities, and structural-acceptance documents are referenced in evidence exhibit PRV-01.

## | Materials

- **LL30** (structural binder) — project-specific dosage, supplied by LL-TEQ™ for the pavement section to be repaired.
- **Compatible replacement material:** millings (RAP), granular base, or natural soil, free of organic matter, with Dmax and gradation meeting the LL30 acceptance criteria (ref. LL30 Technical Manual).
- **LL25** (surface sealer).

## | Equipment (or equivalent ensuring a compliant finish)

OPERATION	EQUIPMENT	NOTES
<b>Sawing</b>	Diamond-blade concrete saw, full depth of the treated layer	Standard equipment
<b>Excavation</b>	Backhoe, mini-excavator, or hand tools	Suited to the geometry; appropriate for confined urban areas (trenches)
<b>LL30 integration (small repairs)</b>	Batch mixer (where no stabilizer is used)	Acceptable for geometries that do not warrant a full-width stabilizer
<b>Compaction</b>	Double-drum vibratory roller / vibrating plate / trench roller	Plate or trench roller accepted in confined space if 95 % is verified
<b>LL25 sealing</b>	Calibrated distributor truck or spray bar	Ref. LL25 Technical Manual (TEQ-20)

### | Phase 1 — Sawing and excavation

1. Mark the repair area. Straight saw lines, perpendicular to the surface, offset outward from the perimeter of the visible damage so the sawn faces bear on sound treated material. Typical perimeter offset  $\approx$  **150 mm (6 in)**; increase it where edge distress, micro-cracking, or moisture migration is observed beyond this distance.
2. Saw to the full depth of the treated LL30 layer (**50 to 200 mm** depending on the project).
3. Excavate the sawn section. Remove all treated material from the area. Inspect the underlying subgrade. Where soft zones, voids, or disturbed material are identified (typical of a utility excavation), the subgrade **must** be repaired to restore the bearing capacity assumed in the original design before reinstating the LL30 layer. Subgrade-repair documentation **must** be retained by the supervising authority.

### | Phase 2 — Preparation and integration

4. The replacement material **must** meet the same specifications as the original LL30 treatment. The exposed subgrade **must** satisfy the bearing-capacity precondition required for LL30.
5. Integrate LL30 into the replacement material using a cold stabilizer or a batch mixer, at the project-specific dosage supplied by LL-TEQ™. Adjust moisture to the optimum moisture content (OMC) of the replacement material. Dosage, mixing equipment, and OMC verification **must** be recorded in the repair file.

**| Phase 3 — Placement and compaction**

6. Place the LL30-treated material in the excavation in a single lift matching the original integration depth.
7. Compact to a **minimum of 95 % of standard Proctor density** (ref. LL30 SOP). Double-drum vibratory roller where access allows; vibrating plate or trench roller accepted in a confined trench if 95 % density is verified.
8. Verify that the final grade is flush with the adjacent treated surface within the project surface tolerance. The repair joint **must not** show any measurable mismatch or lip at the perimeter.

**| Phase 4 — Sealing, cure, and return to traffic**

9. **Delay before sealing:** wait at least **2 h after final compaction** to let the surface harden (ref. LL30 SOP), then, once the initial cure of the LL30 section is reached, apply the LL25 sealer (ref. LL25 Technical Manual, TEQ-20) over the entire repaired area, overlapping at least **100 mm (4 in)** onto the adjacent intact treated surface to ensure continuity at the perimeter.
10. The LL30 SOP cure requirements apply in full to the reinstated section. The section **must not** be returned to traffic, and LL25 **must not** be applied, before the initial cure specified in the LL30 SOP is reached. Once applied, LL25 **must** have penetrated, set, and dried before exposure to traffic. On-site cure verification is done by visual inspection of surface set under ambient conditions and **must** be retained in the repair file.

- Support and subgrade **not frozen** and stable.
- Ambient and support temperature **> 5 °C** during operations.
- Do not work on a saturated or waterlogged subgrade.
- LL25 requires **at least 3 h without rain** after application.
- Cold reinstatement; seasonal window per the LL30 SOP cure conditions.

## Verification points

Verified by the accredited LL-TEQ™ contractor

The general QC framework of the LL30 SOP applies in full (support preparation, integration uniformity, treatment depth, working moisture, compaction  $\geq 95\%$ , profile homogeneity, stability before traffic). Specific to saw-cut repair, also verify:

REF.	VERIFICATION POINT	CRITERION
V-1	Saw edges	Clean, perpendicular, bearing on sound treated material at full depth
V-2	Subgrade	Inspected at excavation; repaired where applicable before reinstatement
V-3	LL30 integration	Uniform mix across full depth (50 to 200 mm depending on the project)
V-4	Final compaction	95 %+ ; verified by the accredited contractor
V-5	Final grade	Flush; no joint mismatch at the perimeter
V-6	LL25 sealer	Continuous beyond the joint, min. 100 mm (4 in) overlap onto intact surface
V-7	Cure / reopening	Surface not tacky; per LL30 SOP

Ref.: LL30 (TEQ-21) and LL25 (TEQ-20) Technical Manuals. LL30 SOP (pavement construction and rehabilitation) and LL25 Technical Manual (TEQ-20). Supporting structural data: evidence exhibit PRV-01 (lab-field correlation) and datasheet EQV-04 (modulus /  $a_2$  coefficient).

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