LL-TEQ

Localized pothole repair on bituminous pavement

STANDARD OPERATING PROCEDURE · LL-TEQ™ (APH) SYSTEM — ASPHALT POTHOLE MIX

Proudly made in Québec

STANDARD OPERATING PROCEDURE (SOP)

Pothole repair on asphalt

LL-TEQ™ (APH) system « Asphalt Pothole Mix » — LL30 (binder) + crushed aggregate 0–12.5 mm + LL25 (seal)

0–12.5 **Aggregate (mm)**
Crushed stone, D_{max} 12.5 mm, free of organic matter

34.5 **LL30 dosage · L/m³**
≡ 5.25 L/m² over 6 in compacted thickness

95%+ **Target compaction**
To refusal — no imprint, cross-pattern passes

≥ 12 h **Minimum cure**
Before reopening to traffic, per conditions

Purpose & scope

Standardized method for the localized (*spot repair*) repair of potholes on bituminous pavement using the LL-TEQ™ (APH) system — « Asphalt Pothole Mix », formulated specifically for this application: cleanout down to stable soil below, rebuilding the cavity with LL30 + crushed aggregate 0–12.5 mm (0–½ in) compacted to refusal, then surface sealing with LL25. Intended for municipal road-maintenance crews using standard road-maintenance equipment.

Key requirement: cleanout onto **stable soil below** to a **minimum depth of 150 mm (6 in)**, rebuild with LL30 + aggregate 0–12.5 mm (0–½ in) compacted to refusal, then seal with LL25.

Required qualification: the work must be carried out by an **accredited LL-TEQ™ installer**. Accreditation is earned upon completing the **LL-TEQ™ training**, which teaches mix preparation, dosage, compaction to refusal, and the cure and reopening criteria. The accredited installer executes the procedure in accordance with this SOP and judges reopening.

REFERENCE

SOP_LLTEQ_Nids-de-poule-asphalte

VERSION / REVISION

Field execution procedure (Québec) — Rev. C, May 2026

MATERIALS SYSTEM

LL-TEQ™ (APH) — Asphalt Pothole Mix: LL30 (binder) + LL25 (seal) + aggregate 0–12.5 mm

APPLICATION SCOPE

Technical execution department — pothole repair on asphalt surfaces

01

Materials

Constituents of the LL-TEQ™ (APH) system

CONSTITUENT	SPECIFICATION	ROLE
Aggregate	Crushed stone **0–12.5 mm (0–½ in)**, **dry**, free of organic matter.	Structural fill material for the cavity
LL30	Structural binder — APH formulation for pothole repair.	Cohesion and load-bearing of the compacted fill
LL25	Surface seal — APH formulation for pothole repair.	Surface water-tightness of the repaired joint
Water	Misting of the mix per conditions.	Maintaining mix moisture

Reference dosage

34.5 L of LL30 per m³ of stone, i.e. ≈ 5.25 L of LL30 per m² of aggregate placed over 150 mm (6 in) of compacted thickness.

02

Mix design — batch of 6 holes

Calculated quantities and batch preparation

Calculation assumption

Typical hole: **600 × 600 × 150 mm** (24 × 24 × 6 in) ≈ **57 L of stone per hole**.

Quantities per batch of 6 holes

- Stone 0–12.5 mm (0–½ in) dry: 6 × 57 L ≈ **342 L**
- LL30: 342 L × 34.5 L/m³ ≈ **12 L**

Preparation procedure

- Load the mixer: stone + LL30 at the 34.5 L/m³ dosage.
- Mix for a few minutes until uniform integration — even colour, texture and moisture, aggregate fully coated by the binder.
- Empty into the handling container (bin). Repeat batches until the batch volume is reached.
- Tarp the bin: in the shade, sheltered from direct sun and rain.
- Use the batch within **3 h** of mixing.
- Mist water onto the mix every hour to maintain moisture, especially in hot weather.
- Beyond 3 h, keep using the mix while maintaining misting until the batch is used up.

Critical parameter: moisture. Hourly misting keeps the mix moist until placement — a direct condition for reaching target compaction.

03 Site equipment

Suggested equipment — any equivalent is acceptable

TRANSPORT

Carrier vehicle

Pickup or trailer for the mixer, bin, materials and tools.

FINISHING (OPTION)

Asphalt saw — optional

Optional, for clean finished edges. Diamond blade — suggested: Husqvarna K770 or equivalent.

CLEANOUT

Hand tools

Pick, shovel, wheelbarrow, broom — extraction and cleaning of the cavity.

MIXING

Site concrete mixer

Usable capacity ≥ 100 L per batch (≈ 180 L drum).

HANDLING

Mix container

Low, wide bin ≈ 400 L (tub, open crate or bulk bag) with easy shovel access + waterproof tarp.

MOISTENING

Hand sprayer (water)

Misting — suggested: 5–8 L pressure sprayer or equivalent.

SEALING

LL25 applicator

Calibrated hand sprayer — suggested: Rosco Maxigill or ETNYRE for high volume; dedicated pressure sprayer for spot repairs.

LEVEL

Straightedge / level

Check of the final grade, flush with the adjacent surface.

Compaction — two equipment options

Suggested — Single vibratory plate, 50–80 kg (width ≥ 40 cm)

Carried by 1 person, direct loading without a ramp. Compaction in ≈ 75 mm (3 in) lifts, refusal at each lift.

Alternative — Reversible vibratory plate, 90–120 kg

Compaction possible in a single 150 mm (6 in) lift. Requires 2 people and a loading ramp (or tail-lift).

Note — High-performance equipment (high volume)

For high-volume pothole operations, the highest-performing equipment is for example the **Cemen Tech C60 mounted on a 2023 Mack MP7 4776 truck** (mobile continuous-mixing unit). This type of equipment enables continuous on-site production, with no batch preparation, and is particularly suited to large-scale municipal operations.

04

Field procedure

Execution sequence — minimum cleanout depth: 150 mm

1 Delimitation

Mark out the zone **set back from the visible defect**, onto sound material. **Optional sawing** (asphalt saw) for clean edges: straight cuts, perpendicular to the surface, through the full thickness of the asphalt.

2 Cleanout & cleaning of the cavity

Remove the degraded material to a **minimum depth of 150 mm (≈ 6 in)**. Blow or sweep out the cavity (dust, debris, standing water). **Make sure the soil below is stable** before continuing.

3 Placing the mix

- **50–80 kg plate:** in 2 lifts of ≈ 75 mm (3 in), compaction to refusal after each lift.
- **90–120 kg plate:** in a single 150 mm (6 in) lift, compaction to refusal.

Slight overfill above the adjacent surface to compensate for settlement under compaction. Spread evenly, with attention to corners and edges.

4 Compaction to refusal

Compact to refusal — no deformation, no imprint under the machine. **Target: 95%+.** Cross-pattern passes, with particular attention to edges and the joint with the existing surface. Check the final grade, **flush with the adjacent surface** — with no ridge, bump or depression at the joint.

5 Surface sealing — LL25

Once the LL30 has begun its initial set (stable surface, no pull-off to the touch), apply LL25 by uniform spraying until the surface is fully saturated. Overlap the seal onto the adjacent intact surface to ensure joint continuity. Additional passes until visible saturation.

6 Cure & reopening to traffic

Minimum **12 h** cure depending on conditions, until the surface is **rigid and the cure complete**: stable to the touch, no material transfer, LL25 dry at the surface. Curing proceeds faster in hot, dry, well-ventilated weather; high humidity or low temperature lengthen cure time. Protect from **rain** during the initial cure. The **accredited installer's** judgement, based on observed stability, governs reopening.

05

Quality control & acceptance criteria

Check points during and at the end of execution

REF.	CHECK POINT	ACCEPTANCE CRITERION
QC-1	Cavity edges	On sound material, clean
QC-2	Soil below	Stable, no soft spots, no standing water
QC-3	Depth	≥ 150 mm (6 in)
QC-4	LL30 integration	Uniform mix, aggregate fully coated
QC-5	Mix moisture	Misting maintained, mix moist at compaction
QC-6	Compaction	95%+; refusal reached
QC-7	Final grade	Flush, no ridge or depression
QC-8	LL25 seal	Full saturation, overlapping onto adjacent surface

06

Execution conditions

Environmental and placement preconditions

- Substrate **not frozen**.
- Ambient and substrate temperature **> 5 °C**.
- **LL25 requires at least 3 h without rain after application**; do not apply the seal if rain is possible within 3 h. Rain dissolves LL25 and prevents it from integrating (redo required).
- **Avoid rain during application and cure**; substrate not saturated.
- Aggregate kept dry before mixing.
- Mix tarped, in the shade, moistened as needed.
- Fill material free of organic matter.

In case of unfavourable conditions

Adjust the means: protection from rain, a warmer time window, extended cure. The cure and set of the LL-TEQ™ system depend directly on temperature, humidity and the absence of precipitation.

LL-TEQ™

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