

Engineered Solutions for Ground and Project Challenges

Settlement | Voids | Ground Failure | Backfilling

Structural Support | Service Routes | LCC Technology



Lightweight, pumpable LCC solutions for confined and difficult-access areas.

About Tusanid

Purpose: Provide LCC Solutions for Complex Ground Challenges

Construction and infrastructure projects frequently encounter severe ground and subsurface conditions, including soil settlement, hidden underground voids, structural instability, weak support zones, and shifting utility routes.

Tusanid solves these challenges through advanced Lightweight Cellular Concrete (LCC) InLine Technology. By enabling high-volume, on-site LCC production with consistent quality, we equip clients to implement practical, high-performance engineering solutions—specializing in confined spaces, subterranean voids, and restricted-access sites.

Key Challenges We Address

Ground Settlement: Restoring structural support and reducing foundation-related risks.

Underground Voids: Efficiently filling cavities, sinkholes, and abandoned subterranean spaces.

Utility Protection: Stabilizing pipes, trenches, and service routes against displacement.

Restricted Access: Delivering high-performance fill material directly to difficult-to-reach areas.

Lightweight

Reduced added load for suitable ground applications.

Pumpable

Reaches confined and difficult-access areas.



InLine technology for on-site LCC production and pumping

Problems Tusanid Helps Address

Tusanid provides engineering solutions using LCC technology for a range of ground, structural, and service-route challenges, according to each project's conditions and technical requirements.



Settlement and weak support zones

Areas affected by settlement, loss of support, or voids beneath structures.



Underground voids and cavities

Selected void-filling and cavity-treatment applications where pumping access is required.

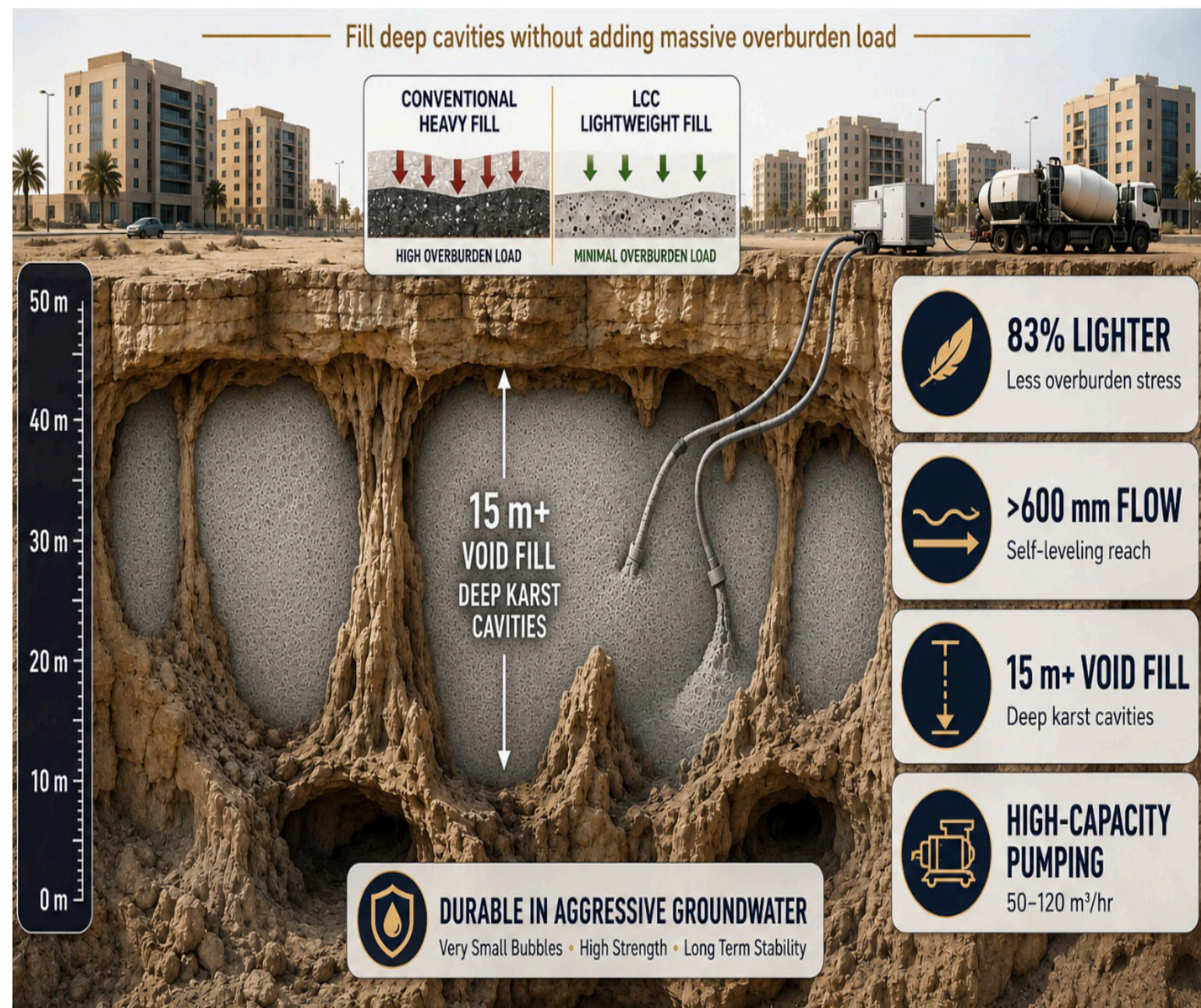


Unstable pipe and utility routes

Support and protection where soil loss, voids, movement, or settlement are concerns.

Other applications include ground failure and unstable areas, backfilling behind structures and walls, confined spaces, and foundation, road, and platform support.

LCC Technology for Difficult Areas



Flowable. Lightweight. Engineered around the application.

- Lightweight and pumpable for suitable applications.
- Flowable and self-leveling placement behavior.
- Suitable for confined spaces and underground voids.
- Density, strength, and flow characteristics can be configured.

Tusanid provides solutions using LCC technology, an engineered approach based on a material whose properties can be configured for the project application.

Typical placement zones

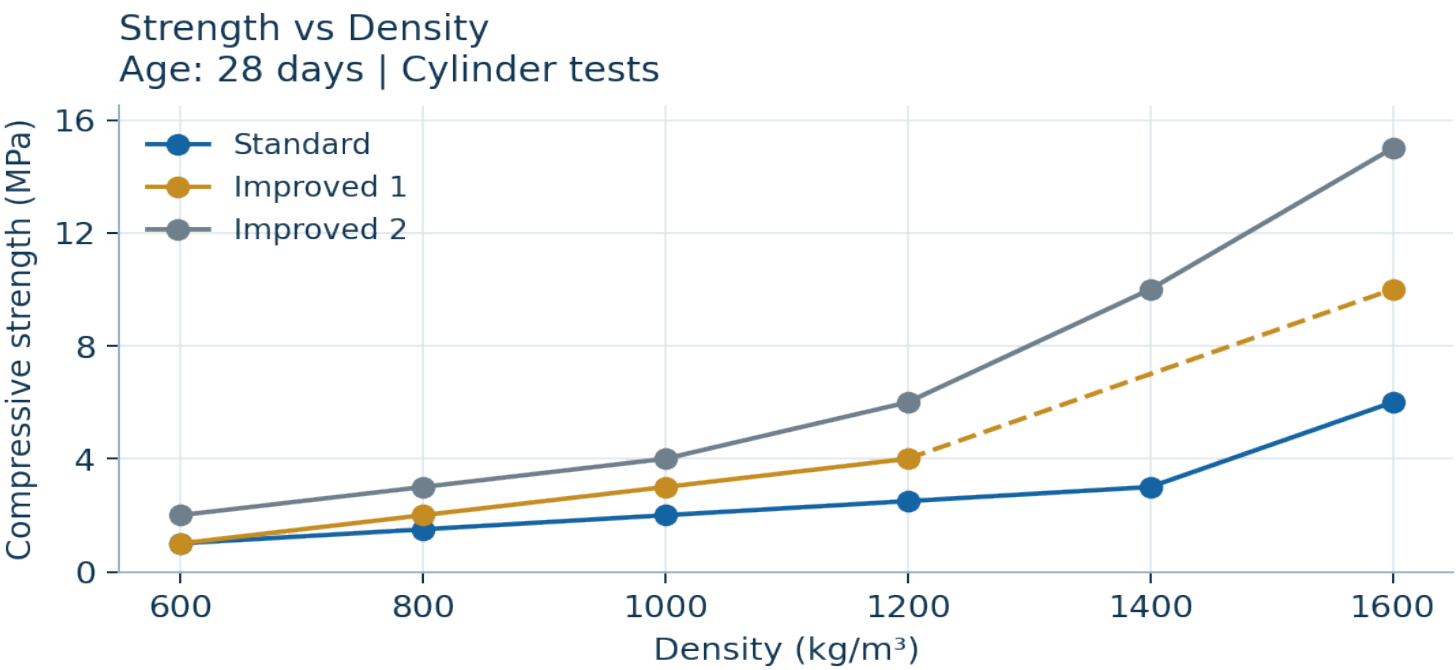
- Voids beneath roads, platforms, and foundations.
- Trenches and service routes.
- Areas surrounding existing pipes and utilities.
- Areas where conventional compaction is difficult.

Technical Properties

Density and Compressive Strength

Typical 28-day compressive strength of Lightweight Cellular Concrete (LCC), based on cylinder tests. Different mix designs are available to meet project requirements.

Density (kg/m³)	Compressive strength at 28 days (MPa)		
	Standard	Improved 1	Improved 2
600	1.0	1.0	2.0
800	1.5	2.0	3.0
1,000	2.0	3.0	4.0
1,200	2.5	4.0	6.0
1,400	3.0	—	10.0
1,600	6.0	10.0	15.0



Typical Applications

Backfilling

Lightweight backfill for structures and embankments.

Trench Filling

Filling utility and service trenches.

Void Filling

Filling underground voids and cavities.

Ground Stabilization

Improving ground conditions and reducing settlement risk.

Technical Notes

1. Values are typical 28-day compressive strengths based on cylinder tests.
2. Improved Strength 1 and 2 mixes require higher cement content and special additives.
3. No data is available for Improved Strength 1 at 1,400 kg/m³; the chart shows a dashed connection.
4. Different mix designs are available depending on project requirements.
5. Final mix design and performance are subject to project specifications and technical approval.
6. Cube or cylinder testing can be provided based on project requirements.

Application Areas

LCC solutions can be considered across infrastructure, buildings, engineered fill, industrial, mining, and underground applications.



Infrastructure and roads

Settlement areas, roads, platforms, approaches, and engineered fill.



Buildings and structures

Foundations, floors, platforms, and surrounding backfill.



Mining and industrial works

Industrial sites, underground spaces, voids, and controlled backfilling.

Additional contexts include pipes and utilities, crossings, existing services, restricted-access operating areas, and underground project interfaces.

What Distinguishes Tusanid

A problem-first approach

- Solutions begin with the problem, not the product.
- Site conditions and project requirements are reviewed before selecting the approach.
- LCC is used for applications that require a lightweight and pumpable material.
- The approach can reach confined and difficult-access areas.
- Loads and pressures can be reduced in suitable applications.
- Technical review, mix design, production, pumping, placement, and quality checks can be coordinated.

Coordinated project support

- Technical review and project-specific requirements.
- LCC application and mix-design direction.
- Production, pumping, and placement coordination.
- Quality checks and project documentation.

Delivery Methodology

01

Understand

Review drawings, reports, photographs, levels, access, and surrounding assets.

02

Define

Clarify the problem and the required outcome.

03

Assess

Review geometry, loads, ground condition, voids, services, safety, and constraints.

04

Plan

Define the method, LCC properties, sequence, pumping, and quality checks.

05

Confirm

Coordinate production, placement, inspections, and project review.

Execution focus

- Access and logistics
- Placement sequence
- Interfaces and safety
- Quality checks and documentation

From condition to action

The delivery pathway is organized around the actual site condition, required outcome, access limitations, and project interfaces.

Project Information and Contact

For an initial review

- Project location and description of the problem.
- Drawings, surveys, reports, and specifications.
- Photographs and videos.
- Approximate dimensions of the area or void.
- Loads and existing structures.
- Pipe, utility, and service-route locations.
- Access limitations and working-area constraints.
- Project schedule and design criteria.

Contact Tusanid

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Service focus

Voids, settlement, backfilling, structural support, service routes, and LCC technology solutions.



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