ERON + PermaShield — Public Technical Dossier (2026)

This document is a public, non-sensitive overview of the ERON (Energy■Resilient Oasis Node) and PermaShield infrastructure system. It is intended for builders, researchers, open■source collaborators, and early■stage prototyping partners. Sensitive parameters, security thresholds, and pressure limits are intentionally excluded.

1. Project Purpose

Permafrost thaw is a near■term infrastructure failure problem, not a distant climate scenario. ERON + PermaShield is designed to buy time — stabilizing ground, preserving structures, and reducing emissions while long■term global solutions mature.

2. System Overview

1. PermaShield: A structurally independent HTM■FRP foundation platform designed to span ground loss during abrupt permafrost thaw.
2. ERON Node: A modular, energy■positive node providing power, waste processing, sensing, and autonomous maintenance.
3. AI Control Layer: On■device ML systems that detect damage, trigger repair logic, and coordinate learning across nodes.

3. Engineering Reality Check

This project does not claim reversal of climate change. It explicitly targets resilience, damage prevention, and controlled degradation under known physical limits. Failure is expected at population scale and is managed via rolling replacement.

4. AI Self■Repair System (CLSEREP)

CLSEREP is a closed■loop diagnostic and response system. It detects cracks, classifies severity, selects a repair playbook, and logs actions for audit. The system prioritizes false■negative minimization to avoid missed structural failures.

1. CNN crack detection validated on multiple real■world datasets.
2. False Negative Rate ≈ 0.15% on clean benchmark data.
3. Inference suitable for edge devices (~17 inferences/sec).

5. Carbon Handling (Public Claim)

ERON processes organic waste to generate energy and stabilize biogenic carbon in durable forms (soil carbon, biochar, mineralized CO■). Public claims are conservative and exclude avoided emissions unless explicitly stated.

Public Accounting Range:

1. Decentralized nodes: 200–1,000 tCO■ over 50 years.
2. Clustered/municipal nodes: up to ~25,000 tCO■ over 50 years (site■dependent).

6. Open■Source Collaboration Goals

This repository and dossier exist to attract builders, not hype. Contributors are encouraged to prototype subsystems, test materials, challenge assumptions, and improve safety margins.

1. AI & sensing validation
2. Small■scale structural printing tests
3. Local material recipe translation experiments

7. What This Is Not

1. Not a perpetual motion machine.
2. Not a single■point megaproject.
3. Not dependent on speculative future physics.

8. Ethical & Safety Position

ERON + PermaShield is designed with fail■safe defaults, offline survival modes, and population■level resilience. Security, misuse resistance, and physical safety are treated as first■class design constraints.

9. Invitation

If you can improve this system, you are invited to do so. There is no ego requirement — only evidence.