SEMATECT WORKING PAPER

Proof-of-Forage, beta v5.4

Claims, cells, six-side caps, and why nectar is not more postage.

This note is doctrine, not an offering. There is no mainnet STCT until a contract address is published at www.sematect.org. Do not buy a ticker that claims to be this project unless that address appears there.

1. What changed in v5.4

v5.3 named the miner's NFT a plate and treated nectar as optional bait the miner takes. That left two holes. Newcomers did not know what a plate was. Patrons had no reason to pin ETH instead of raising the STCT stamp.

v5.4 locks four rules. The miner NFT is a **claim**. The thing on the board is a **brick**. A seated claim can pay at most six neighbor sides, then it is a souvenir. Nectar (ETH, USDC, or wrapped BTC) is how a patron mints a **cell** — a second NFT stamps cannot print.

2. Objects

Object	Plain meaning	Who holds it
Brick	The built hex on the public board.	Commons. Anyone may inspect it.
Work order	A paid job pinned to one empty hex.	Posted by a patron.
Stamp (STCT)	Required postage. Makes the order legal.	Escrow, then the miner on fill.
Nectar	Optional ETH, USDC, or cbBTC bait on that hex.	Escrow, then the miner on fill.
Claim (721)	"I built that brick." Pays at most six neighbor grains.	The miner who filled the hex.
Cell (721)	"I fed that brick." Minted only if nectar was pinned.	The patron. Sellable.
Patron stall	Title on the hex, not the brick. Rent on neighbor fills.	Whoever paid the stamp.
Certificate	Path + caste + map seed + nonce + hex.	Miner, then the chain.

Each miner is one insect. One person may run many miners. Paying a stamp does not mint a claim. Pinning nectar does not mint a claim. A cell is not a claim.

3. Who gets what

	Miner	Patron, stamp only	Patron, stamp + nectar
Spends	Work — a legal forage.	STCT stamp.	Stamp + ETH / USDC / cbBTC.
Gets	Claim + stamp + nectar.	Normal stall rent, six sides.	Richer rent, six sides, plus a cell.
Does not get	The cell.	Claim, nectar, or cell.	The miner's claim or the nectar.

4. The six-side cap

A hex has six neighbors. That number is the cap. A seated claim collects a small STCT grain each time one touching hex is filled, at most six times. A stall collects STCT rent on the same six events. After the sixth fill the claim and the stall stop paying. They do not melt. They remain as signed souvenirs and may be sold. The buyer receives only unused sides.

This is the answer to early-miner lock-in. An old claim is a head start that ends. It is not a factory. New miners earn new claims on new ground. A seated claim never takes a neighbor's nectar, stamp, or claim.

5. Why pin nectar instead of more STCT

Postage and food are different jobs. The stamp makes the work order legal. Raising the stamp is more postage. It does not mint a cell. Nectar is money people already trust. Three prizes attach only to nectar:

Speed. Autopilot forages fed hexes first. That is Seeley's recruitment to rich patches, not a private chat. A stamp-only hex waits.

A richer stall. Neighbor-rent in STCT is larger on a fed hex, still capped at six sides.

A cell. When the hex fills, the patron mints one cell. The cell can be sold. The buyer collects remaining richer-rent sides. A cell cannot be minted with STCT alone.

Miners come for ETH before they trust STCT. They leave with ETH, STCT, and a claim. Patrons spend ETH to have the wall built now and to hold a cell they can keep or sell. That is the on-ramp. Foreign bait does not replace the stamp.

6. Public nest, private puzzle

The nest does not reset. There is no match clock. The board is public: bricks, open orders, visible nectar. The homework for docking is private:

Map = G(hex, wallet, caste, nestRoot).

A copied neighbor path fails because it is not a path on your instance. nestRoot changes when a brick lands next door. Difficulty may rise as the nest fills, and the thin SHA-256 lock's leading-zero count k may rise if valid certificates arrive too fast.

7. Proof-of-Forage

A certificate that mints a claim must pass four checks. (1) The path is on that miner's map for that hex. (2) Score S beats target T for that caste and nest state. (3) SHA-256(seed || caste || P || miner || nonce || hex) shows k leading zero bits. (4) First valid certificate for that open order wins. A click is not a certificate.

Formica score is integer Euclidean tour length against a target near alpha times the MST of the same points, after ACO-style construction (Dorigo 1996, 2004). Apis score is capacity-limited nectar collected, load(P) ≤ C, plus a max-adjacency comb dock (Seeley; Hales; Golden). Macrotermes legality is a drop on local density q using the published pick/drop squares (Bonabeau; Camazine). A copied receipt from one caste fails pathLegal for the others.

8. What this paper does not claim

Search is real and the check is public. This does not pay like Bitcoin. Three published local rules are not three skins. Nature does not beat ASICs. Citations do not create a market. A cell is not a claim. Nectar does not replace STCT. Native BTC does not sit in a Base hex — wrapped cbBTC may. First certificate wins; first click does not. Idle claims and cells do not melt.

9. References (unchanged library)

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