

FREYA GREENHOUSE ROCKET MASS HEATER

Design Review Packet - Draft V2 | 6-inch J-tube / raised split-flow oven / startup bypass / return mass bench

REVIEW DRAFT - NOT FOR CONSTRUCTION. The slab has not been poured and the heater has not been mortared. This packet is being circulated now so experienced builders can identify draft, flow, clearance, foundation, chimney, or serviceability problems before construction.

1. Known constraints

Item	Current input
Heater slab envelope	49.5" wide x approximately 86" long
Chimney penetration	Approx. center: 32" from short/end wall and 21" from long wall - field verification still required
System	Nominal 6-inch J-tube
Drum	24" diameter stainless removable-lid drum
Firebox front	Salvaged stove frame approximately 20" square; finished depth/leg geometry TBD
Oven	Raised; gas intended to divide around oven and recombine
Mass bench	At far end; normal exhaust returns along left side toward chimney
Bypass	Short startup/direct-draft route from collector/hot end to adjacent chimney
Cleanouts	Three planned; exact door dimensions TBD

2. Proposed plan and gas-flow logic

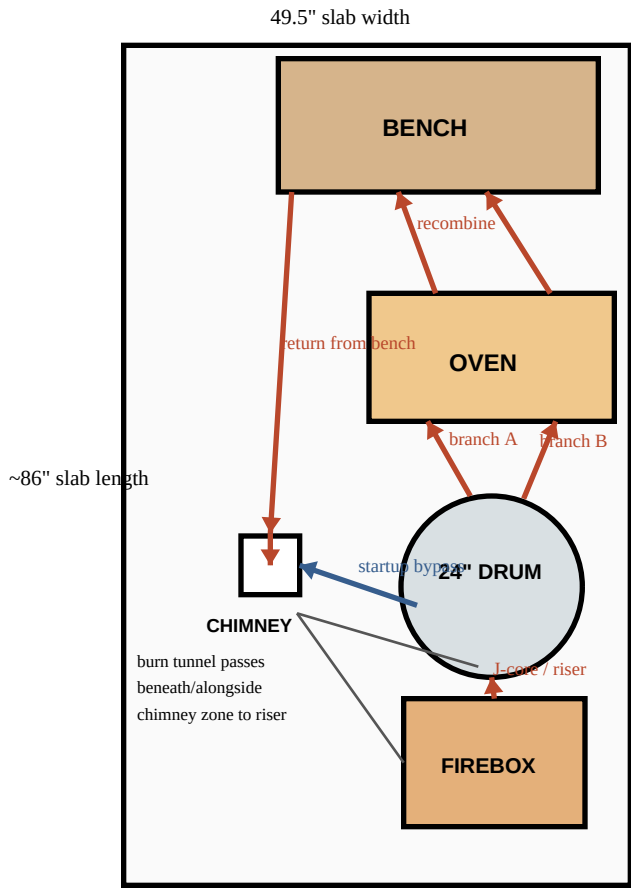


FIGURE 1 - PROPOSED PLAN LOGIC

Based on owner's sketch; not to scale.

Normal path (rust arrows):

- firebox -> burn tunnel -> riser/drum
- > bottom collector
- > split around raised oven
- > recombine -> bench
- > return down left side
- > chimney

Startup path (blue):

- collector -> bypass -> chimney

Important:

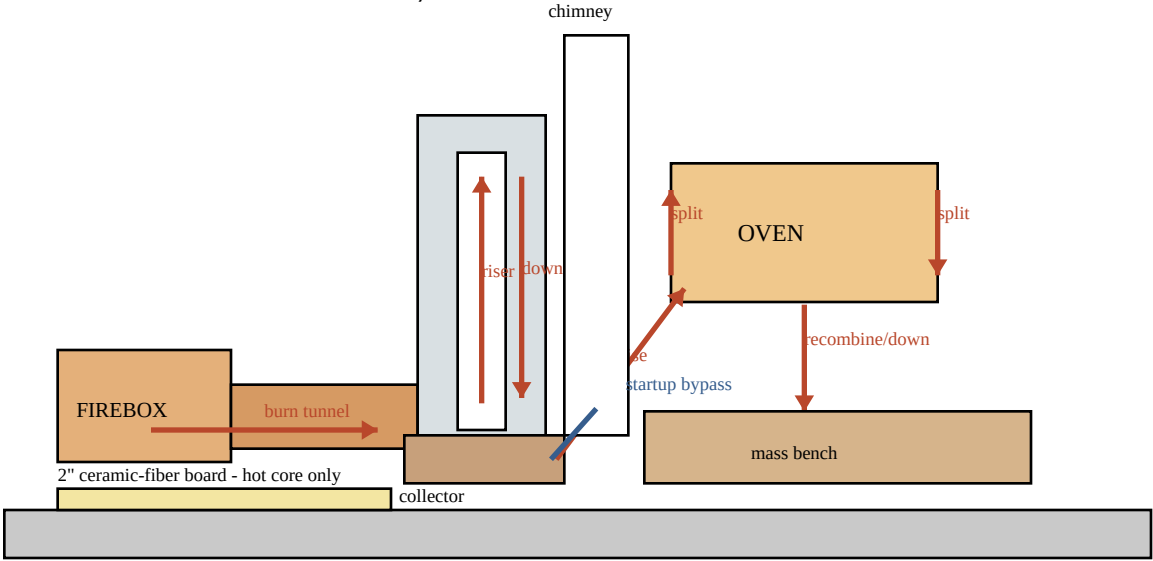
- Return goes to 24" drum footprint, not inside the 24-inch drum footprint.
- Bench occupies the far end.
- Return comes back along left side.

DO NOT BUILD FROM THIS FIGURE.

Figure 1 follows the owner's preferred physical arrangement. The firebox and drum occupy the near/right hot end. The chimney is adjacent to that hot end but must remain independent of and outside the removable drum footprint. The raised oven lies beyond the drum. The mass bench occupies the far end. After the bench, normal exhaust returns along the left side to the chimney. A short bypass at the hot end is intended only to establish draft during startup.

3. Conceptual vertical relationship

FIGURE 2 - CONCEPTUAL SECTION; vertical dimensions and clearances TBD



The J-tube core remains conventional in principle: feed/firebox -> horizontal burn tunnel -> insulated vertical heat riser. Hot gas rises inside the drum, turns at the top, descends around the riser and enters a bottom collector. The unusual portion begins downstream: collector -> raised oven region -> bench -> return -> chimney. Review is specifically requested before any downstream dimensions are fixed.

4. Flow-area basis

A nominal 6-inch round system has a geometric cross-sectional area of approximately **28.3 square inches**. Draft V2 does not prescribe 28.3 square inches for every rectangular passage. Collectors, turns, splits, recombination zones and ash-prone areas may require substantially more effective area. Reviewer recommendations are requested.

Zone	Current intent	Reviewer input needed
J-core	6-in refractory J-tube, insulated	Feed, burn tunnel, riser dimensions and proportions
Drum transition	24-in removable drum	Top gap; annular clearance; collector geometry
Oven	Two generous parallel paths around raised oven	Bell vs. duct approach; branch areas; recombination
Bench	Far-end thermal mass; full flow returns left	Passage area, length, 180-turn geometry, temperature target
Bypass	Short hot-end collector-to-chimney startup path	Area, damper/diverter design, fail-safe arrangement
Chimney	Adjacent to hot end; independently supported	Diameter, total height, connector, roof penetration and clearances

5. Materials on hand

78 firebricks at 6 x 12 x 2.5 in; about 50 older firebricks at 8 3/8 x 4 x 2 1/4 in; five large refractory pieces at 16 x 10.5 x 2.5 in; three 2-ft x 1-ft x 2-in ceramic-fiber boards; 24-in stainless drum; salvaged wood-stove door/frame; three cleanout doors; pavers; granite countertop scraps; possible marble; and salvaged steel/gauges/locks for a later exterior steampunk shell.

6. Foundation and combustible context

The heater will be inside a wood-framed greenhouse. The current foundation concept is an independent reinforced concrete slab, isolated from the existing greenhouse block/wall structure. The existing excavation contains compacted crusher-run/clayey fill beneath the former paver floor. **No slab should be poured on the basis of this packet until heater footprint, total load and combustible-clearance strategy are resolved.**

7. Questions for experienced RMH / masonry-heater reviewers

1. Does the overall Figure 1 arrangement make sense for a 6-inch J-tube: hot end at one end, raised oven, far-end bench, and return along the opposite side to an adjacent chimney?
2. Is a 24-inch drum appropriate for this 6-inch J-tube, and what feed, burn-tunnel, riser, top-gap and annular-clearance dimensions would you use?
3. Can the low burn tunnel pass beneath/alongside the chimney location if the chimney is structurally independent and properly heat-isolated?
4. How should the barrel-bottom collector be sized and shaped?
5. Would you treat the raised oven as a bell/chamber rather than two literal ducts? What minimum free area should surround it?
6. Does the rise to the oven followed by a descent to the bench create an unacceptable draft penalty, or is it reasonable with a sufficiently strong chimney and startup bypass?
7. Is the short collector-to-chimney startup bypass shown in Figure 1 appropriate? What diverter arrangement would you recommend so the exhaust can never be completely shut?
8. For the far-end mass bench and return, what passage dimensions, total effective length and 180-degree turnaround geometry would you recommend?
9. Where would you place cleanouts so the collector, oven region, bench outbound/return passages and turnaround are all maintainable?
10. What chimney diameter and minimum effective height would you want before approving the downstream path?
11. What wall/floor clearances and ventilated heat-shield construction would you require next to the wood-framed greenhouse?
12. Would you alter the foundation/slab dimensions or construction before the slab is poured?
13. Do you see condensation/corrosion risk from extracting too much heat before the chimney in a humid greenhouse?

8. Measurements still to be supplied

Before a build-ready V3: field-check chimney centerline; chimney height from heater connection to cap; final firebox frame depth, height and leg locations; drum height/rim details; dimensions of all three cleanout doors; oven door and desired oven interior dimensions; exact nearby wood-framing locations; desired finished bench height/width.

The goal of this review is to find problems while everything is still easy to change. The excavation is open, the slab is unpoured, and no refractory masonry has been permanently assembled.