

BUILDING S · YOUNG STREET STAGE 3 · CRESTWOOD, QUEANBEYAN

Food Resilience Living Lab

Grown below, stored with care, shared above.

A partnership between the Sun Villages Institute and the Living Places Institute: a 300 m2 food growing, preparation and storage facility under Building S at Young Street, run as an open, university-grade research program. Prepared by Veridian Developments.

PARTNERSHIP BRIEF · INDICATIVE CONCEPT

Cover: an illustration of the village idea, not a photograph or design of Young Street.

00 · READ THIS FIRST

What this document is, and is not

This partnership brief sets out an indicative concept for discussion with prospective research, design and delivery partners. It is written plainly, with limits stated up front.

- Not an offer, not an appeal. This is not an offer of securities, not a disclosure document and not financial product advice. It does not relate to any offer of shares in any company. No money is being asked for, from investors or donors.
- Estimates, not forecasts. All figures come from published benchmarks and stated assumptions. Costs must be priced by a quantity surveyor and capacity confirmed by design.
- Subject to everything that follows. The facility depends on the Young Street planning position, approval by the board of Sun Villages (Queanbeyan) Limited as owner of the building, site investigation, engineering, design, funding, partner agreements and all required approvals. Its size, layout and timing may change, or it may not proceed.
- No partners are signed. Partner types are described, not named. No research partner, supplier or funder has agreed to take part. Suppliers mentioned are examples from the market with no relationship to this project.
- It supports normal supply. The facility supplies fresh produce and holds a rotating reserve. It is not designed to meet all residents' food needs on its own.

HOW TO READ THE NUMBERS

Every number in this document is marked as an estimate where it is one. Where a figure comes from a published source, the source is listed on the last page. Where it is an assumption, the assumption is written next to it so anyone can test it.

Two institutes, one living lab

The Food Resilience Living Lab is a partnership between the Sun Villages Institute and the Living Places Institute. One brings the village, the building and the people who live there. The other brings the research, the documentation and the networks that let the method travel.

Sun Villages Institute

The village and the program on the ground

- Host site: Building S at Young Street, where the facility is built and run
- Residents as participants, growers, cooks and co-researchers
- Daily operation: growing, kitchen, stores, rotation and the emergency food plan
- Links to regional farms and the wider Sun Villages network
- Replication across future Sun Villages

Living Places Institute

Research, documentation and reach

- Research program design and university partnerships
- Ethics, data and IP agreements with research partners
- Open data platform and annual public report
- Applications to research and government grant programs
- Story of Place documentary and the published method

SHARED COMMITMENTS

One open data set, owned in common and published. Residents first: the lab serves the people who live there before it serves research. Measure before claiming. Every partner named in writing before money moves. First Nations protocol before any native food or plant work.

Roles are proposed and will be set out in a written partnership agreement. Prepared by Veridian Developments. Living Places Institute works alongside Veridian Developments and Regenerative Returns.

Fresh food grown below, shared above

Under Building S, the communal heart of Young Street, sits a 300 m2 basement that grows greens, herbs and mushrooms all year, washes and chills the harvest, and stores regional farm produce and a rotating reserve of staples. A lift carries food up to a commercial-grade communal kitchen. Solar on the roof powers it. Every kilo, kilowatt and litre is measured and published with university partners.

300 m2	of below-ground food rooms: grow room, mushroom rooms, nursery, wash and pack, cool room, freezer, root cellar, dry store and seed bank.
~3 t	of leafy greens, herbs and microgreens a year, about what the residents eat (estimate).
90 days	of grains, legumes and oils held in a rotating reserve for about 85 to 90 residents (estimate).
5	research questions run with universities over three years, with open data.
A$1.3m to 2.5m	indicative all-in cost, to be priced by a quantity surveyor.

The ask

Founding research partners and design and delivery partners to join the Sun Villages Institute and the Living Places Institute in a staged program: feasibility, design, build, then three years of research.



An illustration of the village idea, not a design of Young Street.

03 · THE CASE

Why this, and why here

The problem

- About 90% of Canberra's leafy greens and fruit come from Sydney (ACT discussion paper, reported by ABC, 2022).
- Fresh produce travels far and is the first thing to run short when roads or supply chains are disrupted.
- Big vertical farms have struggled with cost and energy: AeroFarms filed for bankruptcy in 2023 and Freight Farms in 2025.
- Almost no research measures food systems inside occupied apartment buildings over years.

The approach

- Right-size it. Grow what one building eats in greens, not what a supermarket sells.
- Store calories, grow freshness. Greens and mushrooms give vitamins and variety. Calories come from a rotating reserve and regional farms.
- Use the basement well: stable temperature, no daylight, close to the kitchen.
- Make it a lab. Measure everything, publish it, let universities test it.
- Run it every day. A reserve only works if the kitchen cooks from it and restocks it.

Four functions, one loop

Grow

Basement, about 113 m2

- Hydroponic grow room, 3 to 4 tiers under LEDs
- Two mushroom rooms: incubation and fruiting
- Propagation and native seedling nursery

Prepare

Basement and ground floor

- Wash and pack room with potable water and traceability
- Substrate preparation for mushrooms
- Commercial-grade communal kitchen above, with preserving and freeze drying

Store

Basement, about 70 m2

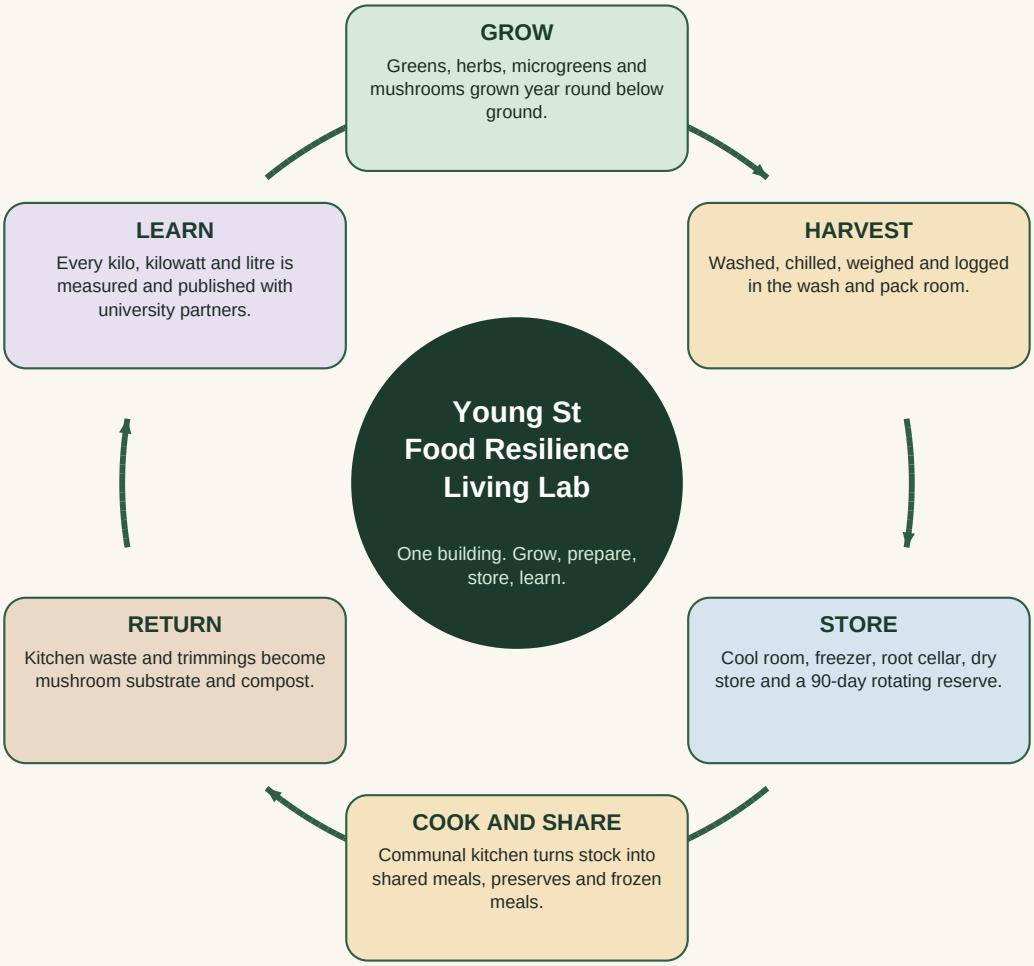
- Cool room 2 to 4 C and freezer room -18 C
- Root cellar for regional farm produce
- Dry store with a 90-day rotating reserve
- Seed bank at -20 C

Learn

Whole building

- Sensors in every room, open data platform
- Five research questions with universities
- Training, school visits and a documentary series

The food loop



INPUTS

Sun
Solar PV on the Building S roof powers lights, pumps and cold rooms.

Water
Mains and rainwater, filtered by reverse osmosis; plant transpiration recaptured.

Regional farms
Potatoes, pumpkins, grains and legumes bought in season and stored.

Seeds
Food crop and local native seed, banked and shared with partners.

OUTPUTS

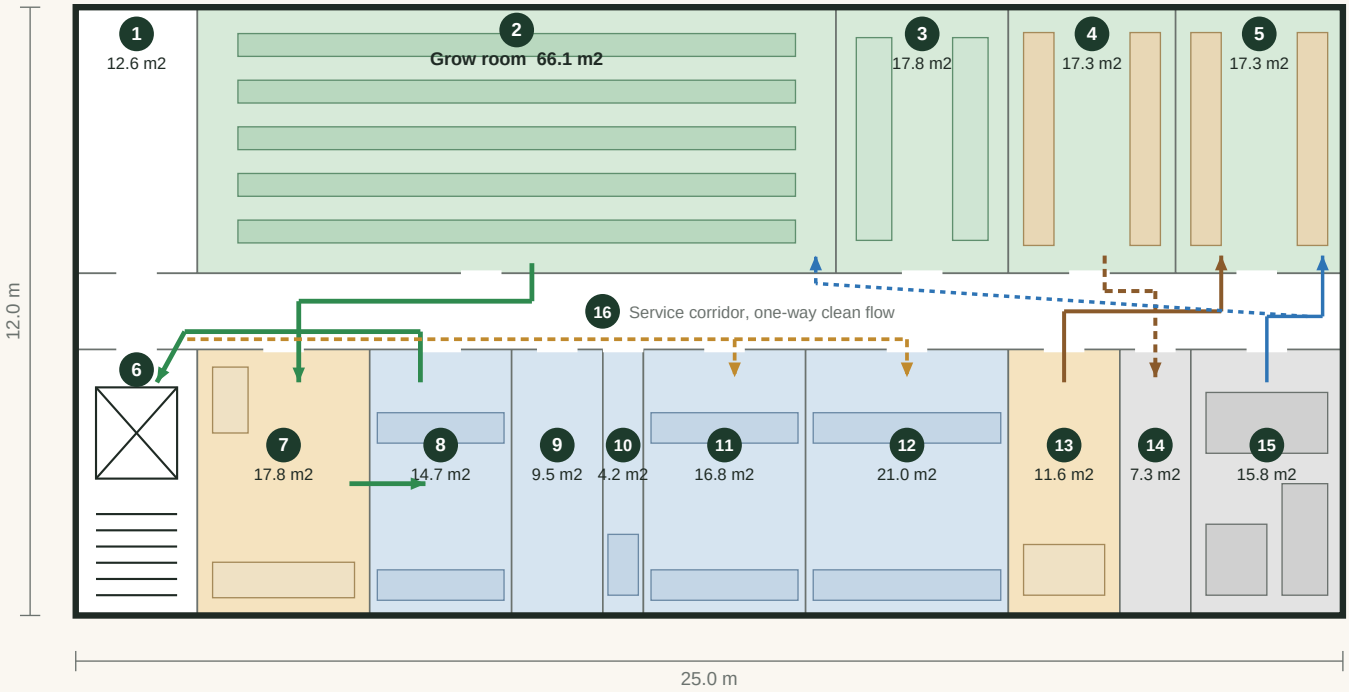
Fresh food daily
Greens, herbs and mushrooms harvested to order.

Shared meals
A communal kitchen cooks from the stores every week.

A ready reserve
About 90 days of staples, always rotating (estimate).

Open data
Published results other buildings can copy.

Basement plan, 300 m2 under Building S



KEY

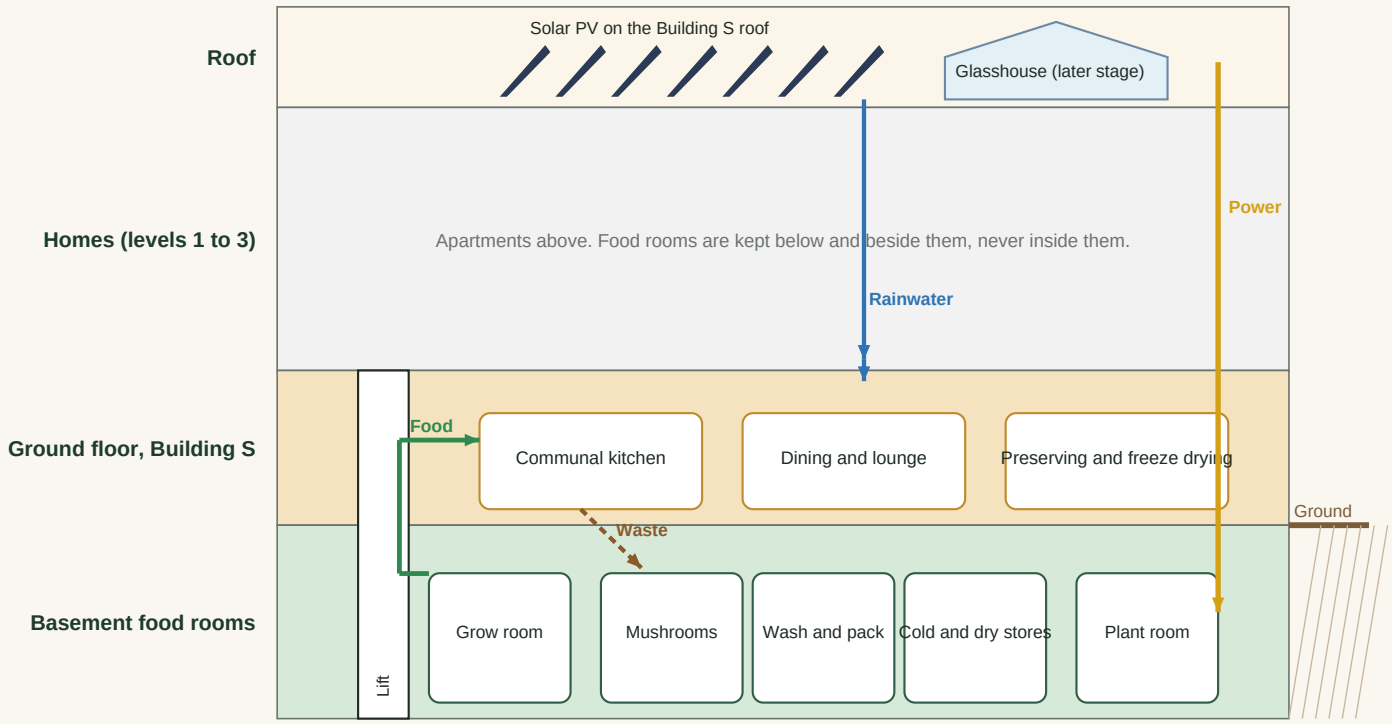
1	Clean entry and airlock	12.6 m2	9	Freezer room -18 C	9.5 m2
2	Grow room	66.1 m2	10	Seed bank	4.2 m2
3	Propagation and native nursery	17.8 m2	11	Root cellar	16.8 m2
4	Mushroom fruiting	17.3 m2	12	Dry store and reserve	21.0 m2
5	Mushroom incubation	17.3 m2	13	Substrate prep	11.6 m2
6	Lift and stair link	12.6 m2	14	Waste and compost staging	7.3 m2
7	Wash and pack	17.8 m2	15	Plant room	15.8 m2
8	Cool room 2 to 4 C	14.7 m2	16	Service corridor	37.5 m2

Indicative concept for discussion. Not for construction. Total 300 m2. Room sizes and positions will change with site investigation and design.

What each room does

No.	Room	m2	What it does
1	Clean entry and airlock	12.6	Hand wash, boots and PPE, pest barrier. Positive air pressure keeps dust and pests out of the grow zones.
2	Grow room	66.1	Leafy greens, herbs and microgreens on 3 to 4 tier hydroponic racks under horticultural LEDs. Dehumidifiers recapture plant transpiration as water.
3	Propagation and native nursery	17.8	Seed germination and seedlings for the grow room, the roof glasshouse, gardens and local regeneration plots.
4	Mushroom fruiting	17.3	Oyster and shiitake fruiting on shelving. High humidity, fresh-air exchange, no lights needed.
5	Mushroom incubation	17.3	Inoculated substrate bags colonise in the dark at stable temperature before moving to fruiting.
6	Lift and stair link	12.6	Connects the basement to the communal kitchen above and the car park basement for deliveries.
7	Wash and pack	17.8	Harvest is washed in potable water, chilled, weighed, labelled and logged for traceability.
8	Cool room 2 to 4 C	14.7	Fresh produce and daily kitchen stock. Remote temperature alarms.
9	Freezer room -18 C	9.5	Frozen reserve of meals, produce and protein. First on the backup power list.
10	Seed bank	4.2	Food crop and local native seed dried to about 15% RH and held at -20 C, duplicated with partner seed banks.
11	Root cellar	16.8	Potatoes, pumpkins, onions and apples from regional farms, held cool by the ground mass.
12	Dry store and reserve	21.0	Rotating pantry plus a 90-day reserve of grains, legumes and oils, used and replaced first in, first out.
13	Substrate prep	11.6	Straw, sawdust and spent coffee grounds are pasteurised and bagged for the mushroom rooms.
14	Waste and compost staging	7.3	Trimmings and spent substrate are sealed and sent up to the roof and garden compost.
15	Plant room	15.8	Climate control, dehumidification, nutrient dosing, reverse osmosis water, switchboard and controls. Fire separated. No batteries here.
16	Service corridor	37.5	1.5 m corridor linking all rooms. Clean flow runs one way, from entry to grow to pack to store.

Food up, waste down, sun in



Battery and inverter sit in a ventilated enclosure outside the basement.

- Food goes up. Harvest is washed, chilled and sent by lift to the communal kitchen.
- Waste comes down. Kitchen scraps and spent coffee grounds become mushroom substrate; spent substrate goes to compost for the gardens.
- Power comes down. Roof solar feeds the plant room. The battery sits outside the basement in a ventilated enclosure.
- Water is filtered for the grow room, and plant transpiration is recaptured by dehumidifiers and reused.
- Air is kept at positive pressure in the clean zones and exhausted away from homes and neighbours.

Every day, and when things go wrong

	Normal days	Supply disruption or power outage
Growing	Full LED cycle, daily harvest to order	Lights reduced or off; mushrooms continue; harvest what is standing
Kitchen	Weekly shared meals cooked from the stores; preserving in season	Daily shared meals from the reserve; household ration plan
Stores	Bought in season, first in, first out, restocked monthly	Drawn down on a 90-day plan; freezer and cool room kept cold on battery and solar
Power	Solar first, grid second	Battery priority: freezer, cool room, controls, then lights
People	About 1 to 2 FTE (estimate) plus a resident roster	Emergency food plan, roles and drills already practised
Data	Logged continuously and published	Logged locally; recovery and lessons published after

The rotation rule

The reserve only exists if it is eaten. The kitchen cooks from it every week and reorders, so nothing expires on the shelf.

Food safety

A Food Safety Supervisor, hygiene and temperature records, traceability from wash and pack, and FSANZ Standard 4.2.8 for leafy greens and microgreens, in force from 12 February 2026. Seed sprouts are left out.

Capacity, energy and cost

Measure	Estimate	How it is worked out
Residents served	About 85 to 90	50 homes at 1.4, 2 and 3 people per 1, 2 and 3-bed unit
Greens demand	About 3.1 t a year	100 g per person a day
Growing canopy	60 to 75 m2	Sized to demand on published vertical farm yields
Growing energy	31 to 56 MWh a year	10 to 18 kWh per kg (industry benchmark, 2026)
Total facility energy	50 to 90 MWh a year	Adds cold rooms, dehumidification and kitchen
Staples reserve	1.5 t (30 days) to 4.6 t (90 days)	0.6 kg of grain, legumes and oil per person a day; fits in 15 to 25 m2 of shelving

Indicative cost

Element (before quantity surveyor)	A$ low	A$ high
Basement structure, shoring and waterproofing (300 m2)	750,000	1,350,000
Grow and mushroom fit-out	150,000	350,000
Cool room and freezer room	40,000	80,000
Commercial kitchen upgrade	150,000	300,000
Solar and battery	100,000	250,000
Design, investigations and approvals	100,000	200,000
Total	1.29m	2.53m

What commercial standard takes

Grow

- Hydroponic racks or towers
- Horticultural LEDs with dimming
- Dehumidifiers that recapture water
- CO2, temperature and humidity sensing
- Nutrient dosing and reverse osmosis

Mushrooms and nursery

- Pasteuriser and bagging bench
- Humidity and fresh-air control
- Germination racks and misting
- Seed drying cabinet

Prepare

- Stainless benches and produce sinks
- Blast chiller and combi oven
- Vacuum packer, dehydrator, canning
- Small batch freeze dryer
- Exhaust hood to code

Store

- Insulated cool and freezer rooms
- Rodent-proof shelving, first in, first out
- Seed freezer at -20 C
- Remote alarms on every cold room

Power and control

- Roof solar PV
- Battery in an external enclosure
- Controller that runs offline
- Open data logging

Safety and hygiene

- Clean entry airlock, positive pressure
- Fire-separated plant room
- Vapour control to protect the structure
- Food safety program and records

A university-grade living lab

Question	Proposed lead fit	What gets measured
RQ1. Energy, yield and cost of basement food growing in a cold-climate apartment building on its own solar	Plant science and protected cropping research groups	kWh per kg, yield per m2, labour, crop loss, solar share
RQ2. Does on-site food change residents' food security, diet and social connection?	Urban food systems and social researchers	Surveys, food diaries, ethics-approved interviews
RQ3. How big a rotating reserve keeps a building fed for 30 and 90 days, and how to run it	Food systems researchers; emergency management practitioners	Stock turnover, waste, cost, drill results
RQ4. Closed loops: kitchen waste to substrate to compost to gardens; water reuse	Circular economy and closed-system researchers	Mass balance, nutrient and water accounts
RQ5. Native plant propagation and local seed duplication for regeneration	Conservation seed banks; restoration and catchment groups	Germination, survival, provenance

- Rules from day one: open data platform; human research ethics approval through the university partner; IP and data agreement signed before funds move; one PhD or postdoc embedded on site.
- Story: the build and first harvests filmed as a Veridian Story of Place documentary series, so the method travels.

Who could help

The kinds of partners the lab is looking for. None has been approached or has agreed to take part.

Research

- Universities in the Canberra region: plant science, food systems, design and social research
- National research agencies, through programs open to small organisations
- Research centres working on closed-system and space food production
- Protected cropping and horticulture research hubs
- Conservation seed banks and native restoration groups

Design and delivery

- Architects and engineers who know the building
- Indoor growing system makers and climate control specialists
- Operators of working indoor farms in New South Wales
- Specialists: geotechnical, structural, fire, mechanical, hydraulic, arborist, food safety, quantity surveyor

Community and promotion

- The Veridian Story of Place film program
- Community farms, seed savers and urban growers in the region
- Farmers markets and local food networks
- Partner communications teams, once agreements are signed

Suppliers and businesses

Examples from the market to show what exists. None has been approached and there is no relationship with any supplier.

Need	Examples	Note
Grow systems	Modular Farms (ZipGrow towers, Intravision LEDs); InvertiGro grow cubes; purpose-built racks	Ask for metered kWh per kg and real yields
Controls	Priva (commercial); Mycodo (open source) for sensing and logging	Must run offline if a vendor's cloud fails
Mushrooms	Rootlab (Australian-made mushroom farm supplies)	Spawn, substrate, equipment
Cool and freezer rooms	Canberra and Queanbeyan cool room builders, three quotes	2025 guide: about A$6k to A$40k+ by size
Freeze drying	Cuddon Freeze Dry (NZ commercial batch freeze dryers)	Size to batch needs
Commercial kitchen	Canberra hospitality fit-out firms, three quotes	Exhaust, blast chiller, combi oven, vacuum packer
Solar and battery	Local accredited installer	Size battery to the cold rooms, not the lights
Seedlings and know-how	Working NSW indoor farms that offer propagation services	Site visit first

LESSON BUILT IN

Avoid single-vendor lock-in. When Freight Farms collapsed in 2025, growers lost cloud controls, parts and support overnight.

A staged, grant-led pathway

Source	What it offers	Fit
ARC Linkage Projects	A$50k to A$300k a year for 2 to 5 years, university-led with a contributing partner	Core research funding; target the 2027 round
CSIRO Kick-Start	A$20k to A$60k matched, up to 12 months, open year-round	First project: design study or closed-loop trial
Disaster Ready Fund	Commonwealth resilience fund; infrastructure projects from A$0.5m; co-contribution required	Watch for the next round; joint bid with Council
Community and education grants	Applications led by the Living Places Institute	Any public appeal only once a fundraising authority or charity registration is in place
R&D; Tax Incentive	Offsets for eligible experimental work	Subject to eligibility advice
National Food Security Strategy	In development by the Australian Government	Make a submission; offer the lab as a test site

How it gets delivered

Feasibility
Months 0 to 4

Site investigation, concept layout, quantity surveyor estimate, partner conversations, CSIRO Kick-Start design study.

Design and partners
Months 4 to 10

Detailed design, supplier quotes, research agreements, ethics approval, funding applications.

Build and commission
Months 10 to 20

Construction with the building, fit-out, sensor network, food safety program, staff and resident training.

Research years 1 to 3
Months 20 to 56

Operate, measure, publish. Annual open report and film episodes.

Replicate
From year 3

Package the method for other Sun Villages and partner buildings.

NEXT THREE MOVES

1. A written partnership agreement between the two institutes, and a capped feasibility budget.
2. Site investigation and concept design.
3. First meetings with Canberra region universities and research agencies, led by the Living Places Institute.
4. Board approval from Sun Villages (Queanbeyan) Limited as owner of Building S.

Timing is indicative and depends on the main building program, investigations, funding and approvals.

Where the numbers come from

ABC News, ACT food production discussion paper (23 Feb 2022)
AGEYE, Modular vertical farming system cost (Aug 2026)
IFT Food Technology, Hard times for indoor agriculture (Oct 2023)
HortiDaily, Freight Farms files for Chapter 7 bankruptcy (May 2025)
NSW Food Authority, Leafy vegetable growers, FSANZ Standard 4.2.8
Hospitality Hub, Cool room and freezer room prices (Apr 2025)
UQ Research Support, ARC Linkage Projects
CSIRO, Kick-Start (updated Aug 2026)
NSW Government, Disaster Ready Fund Round 3
DAFF, National Food Security Strategy
ANU, Australian Plant Phenomics Network; University of Canberra research profiles
ARC, Centre of Excellence in Plants for Space; FreshPlaza, ARC Protected Cropping Hub (Oct 2025)
Western Sydney University, NVPCC; Newcastle Herald, Booma Food Group (Apr 2024)
Modular Farms, Primary Module; Priva; Rootlab; Cuddon Freeze Dry; Mycodo (GitHub)

Begin the conversation

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