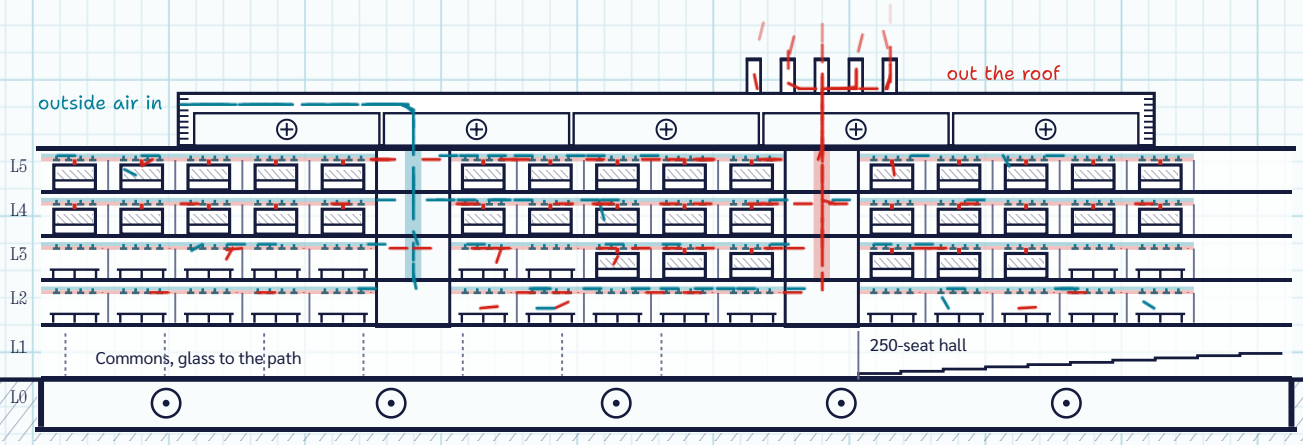
We think your science building can move a third less air.

Thole Ansty's notebook for Bellwick University, left behind after the shortlist interview. The hypothesis, the method and the results are all here, and you can rerun them.

Thole Ansty Architects

Bellwick University
New Science Building

Book	1 of 1
Entry	TA-2611-BU
Site	Quarry Lawn, north end
Gross area	148,000 sf



Drag this down and watch the ducts shrink

12 air changes an hour

82,080 cfm of lab air

167 kBtu per sf a year

Anvers Hall burns its budget on air it throws away.

A chemistry lab can't reuse its air. Every cubic foot is heated or cooled once, pulled across the bench and pushed out the roof. That one fact decides what a science building costs for the next fifty years, so it's where we started.

Anvers Hall has been renovated as far as it can go.

Shortlist brief, section 1

Students should see science from the path, not only from inside a lab.

Provost, interview, November 4

$124M of construction, doors open for fall 2031.

Shortlist brief, section 4

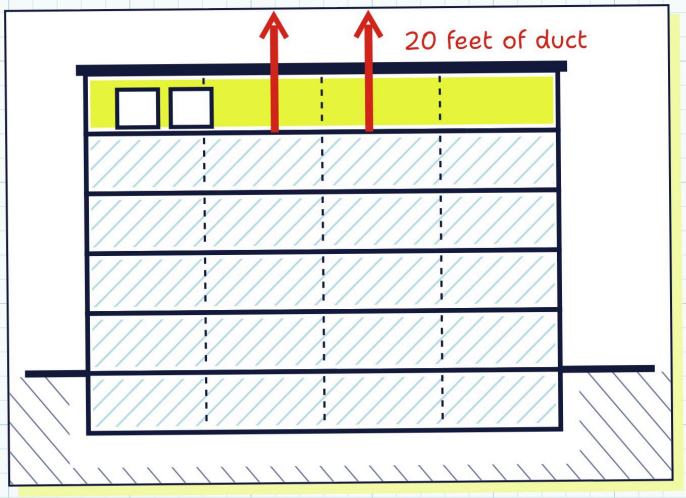
This building must not be the reason we miss 2040.

Campus Sustainability Lead, interview

Observation	Anvers Hall, 1962	Our target	What it means
Energy use, kBtu per sf a year	241	128	nearly half, in a building twice as big
Air changes an hour, occupied labs	14	6	your safety office has the final word
Teaching labs	7	12	shared across departments
Lab seats a week	940	3,456	the fully booked ceiling, past your 2031 plan

Three moves, each one testable.

The design approach in a sentence each. Stack by air and by hours, then keep the quietest work on the rock.

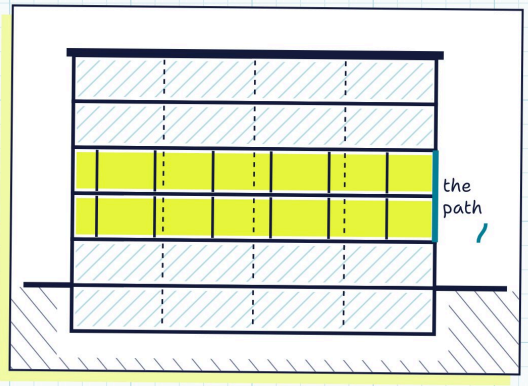


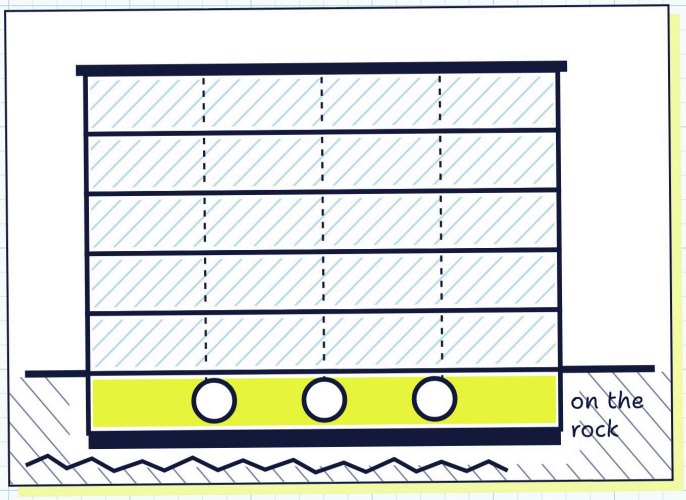
Chemistry goes on top

Shortest duct to the roof means the least fan power, and hoods stay out of the floors that don't need them. Fewer hoods, grouped in shared alcoves, set the size of the whole air system.

Teaching sits in the middle, shared

Twelve labs booked by the registrar, not by a department. Glass faces the path so a first-year walking to class can see titration at 8 p.m.





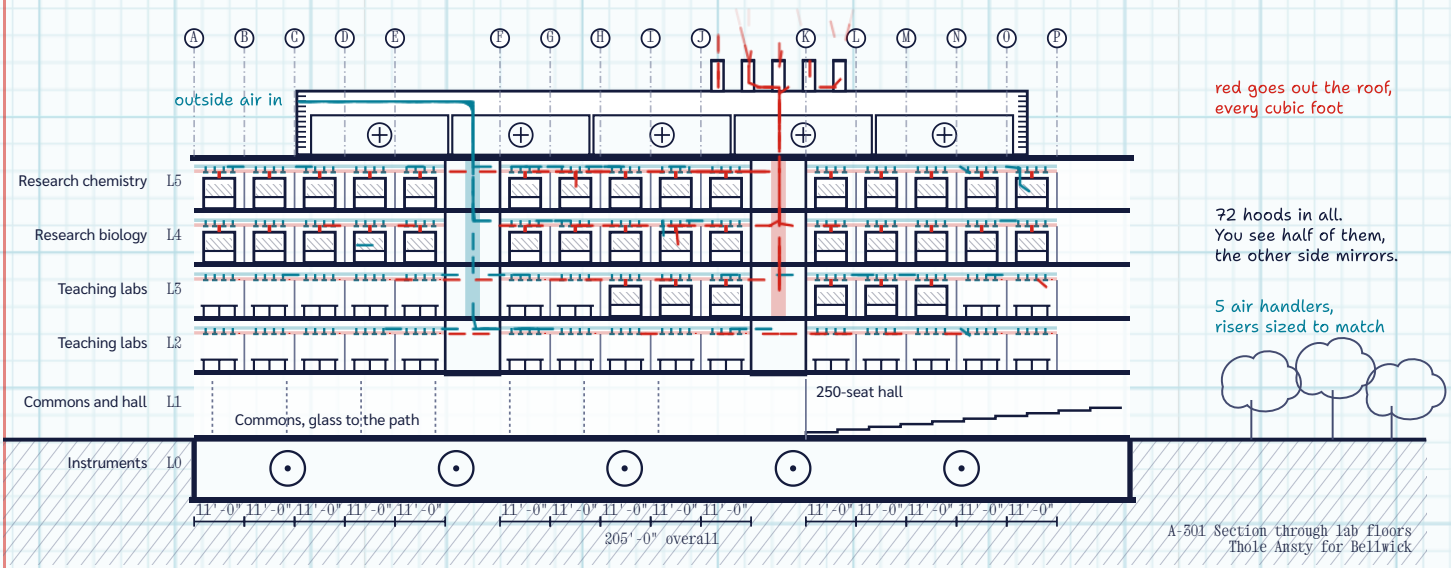
Instruments sit on the rock

NMR and microscopy go below grade on an isolated slab, the one place on Quarry Lawn where a passing truck doesn't show up in the data.

Run the experiment yourself.

Change the lab module, the hoods and the air changes. The section redraws, the air moves, and the numbers below are the ones our engineers would give you.

82,080	167	2,139	$125.98M
cfm of lab air, used once	kBtu per sf a year, $755,011	tons of carbon a year, budget 1,650	construction cost, budget $124M
same as Run A	same as Run A	489 tons over budget	$1.98M over budget



A-301 Section through lab floors
Thole Ansty for Bellwick

10'-6"	11'-0"	12'-0"
315 sf	330 sf	360 sf

Lab module width, 120 modules 30 feet deep

Fume hoods 72

Air changes an hour 12

Run A, campus standard | Run B, our run | Log this run

This is the campus standard as written today. It misses the construction budget and the carbon budget.

Run	Module	Hoods	ACH	cfm	EUI	Tons	Cost
A	11'-0"	72	12	82,080	167	2,139	$125.98M
B	10'-6"	36	6	51,660	128	1,608	$120.65M

Red pen marks waste. Teal ink marks supply. Highlighter marks people.

Book 1, page 4

A day in the building, 7 a.m. to 11 p.m.

Air is only half the waste. A lab that's empty at 3 p.m. is still paid for. Scrub the day, then change the stacking and watch the red hatching leave.

3 p.m.

Play the day

By department | By shared hours | Shared, with a late floor

Each department keeps its own labs and its own keys. Mornings are full, and then a lot of red hatching appears after lunch.

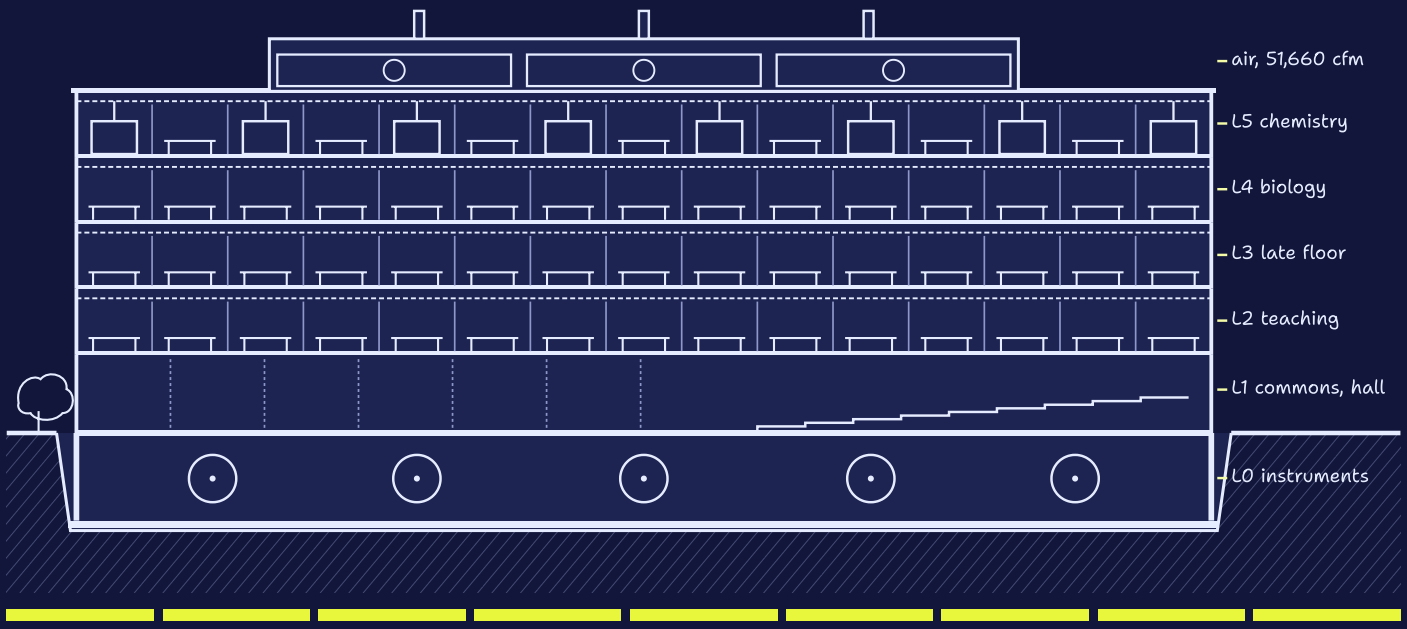


250	47 percent	237	114
room hours empty today, of 528	of the building's day spent empty	students in the building right now	researchers in the building right now

Then we build it, bottom up, and write everything down.

August 2031

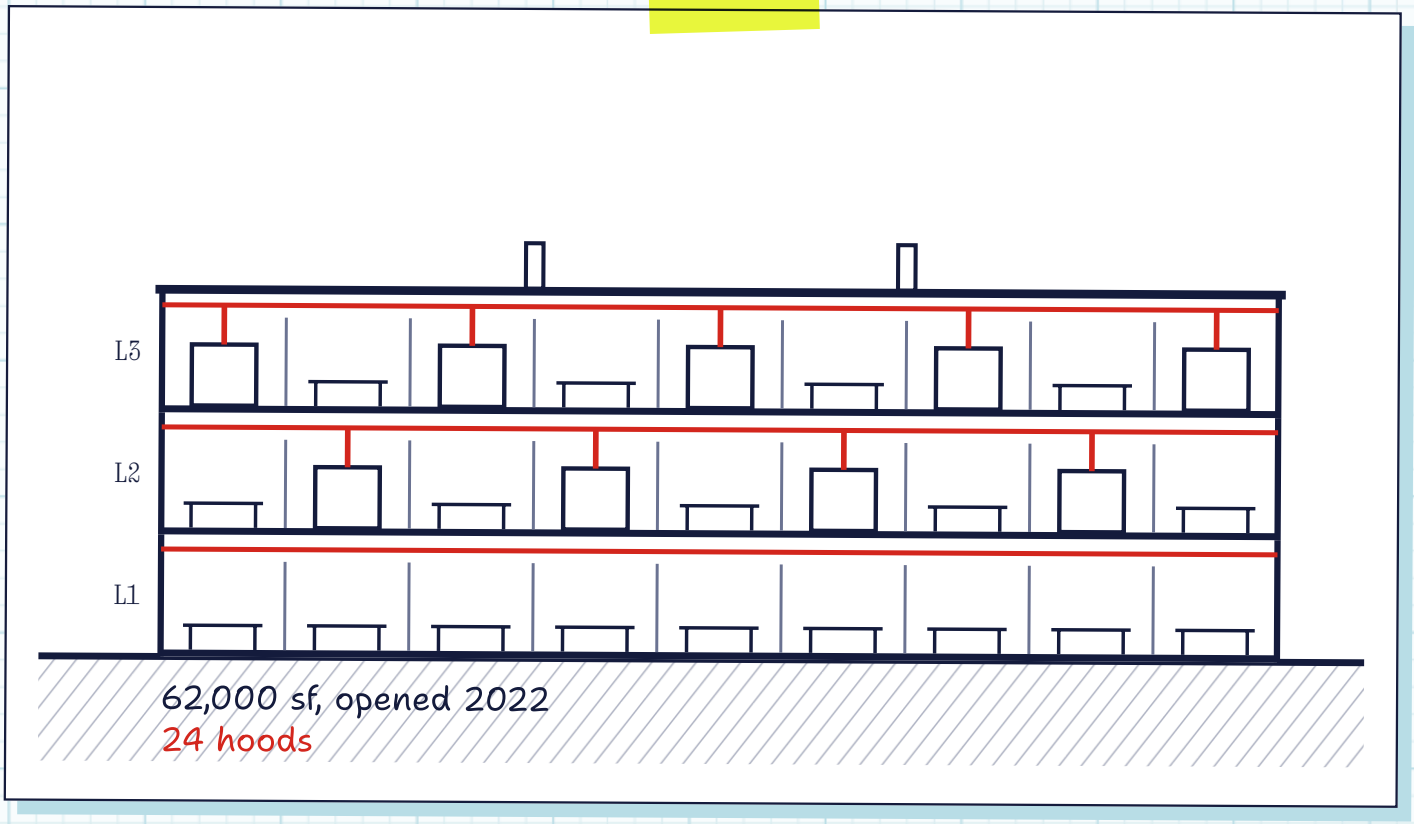
First class, then a year of meters. We stay through the first year and tune it. The target's 128 kBtu per sf, and the result gets written in this notebook.



Results from three earlier experiments.

Every science building we finish gets measured a year later, and we publish the miss. Here's what we predicted and what the meters said.

Ombry College | Tessenden University | Lathmere Institute



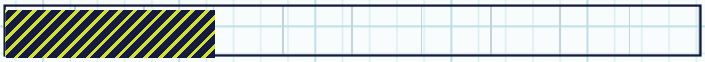
Measure	Predicted	Measured	Miss, percent
Energy, kBtu per sf	118	126	+7
Construction, $M	48.2	49.1	+2
Empty room hours, percent	31	34	+10

We missed energy by 7 percent. One lab manager had switched off the night setback because a freezer alarm kept waking him. A first-year tune would have caught it in a month, so now every project gets one.

Who's at the bench, and when.

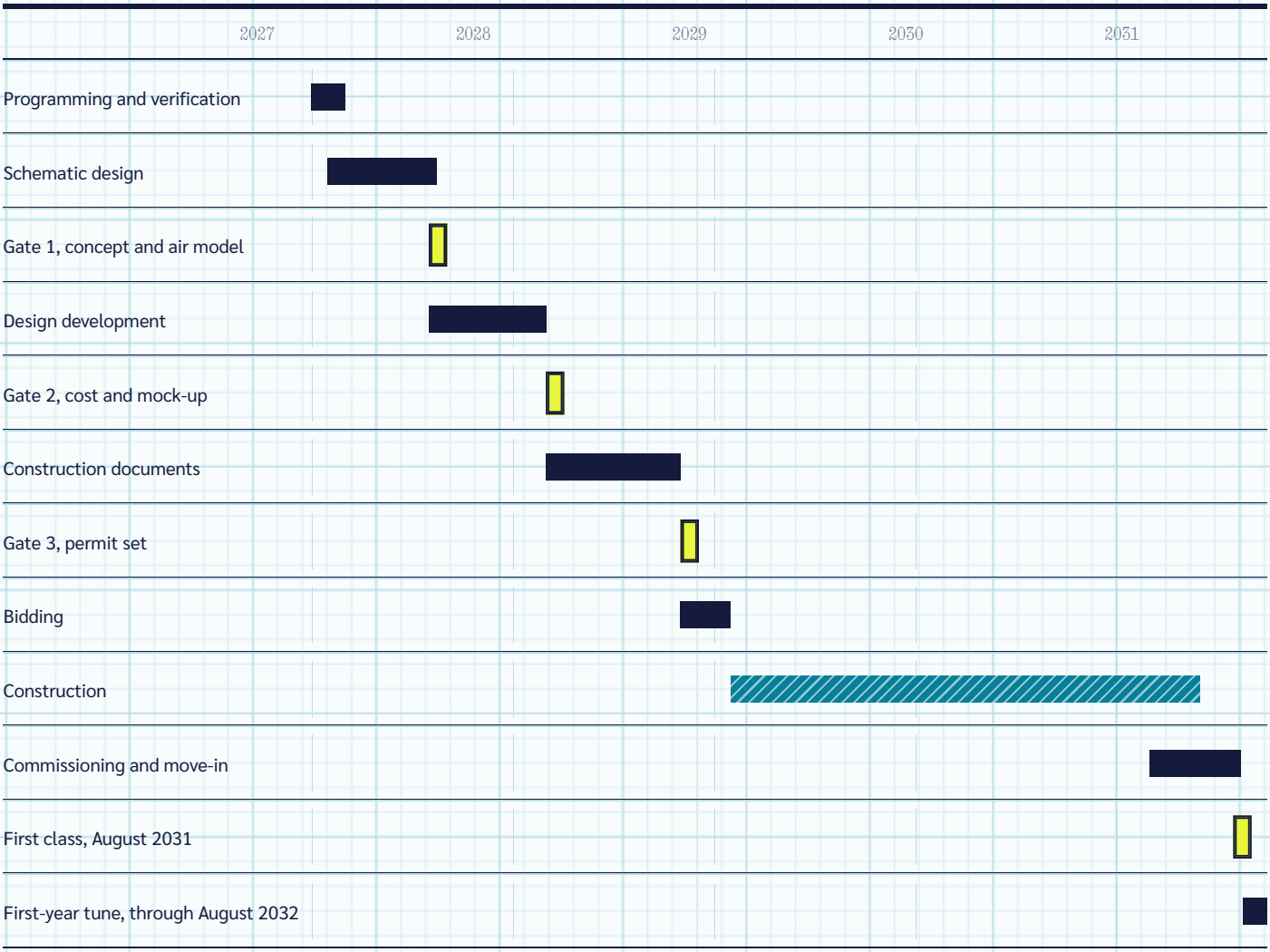
Six named people, all on staff. Pick a phase and see how much of each person Bellwick gets.

Schematic design | Design development | Construction documents | Construction

Nell Principal in charge. Every committee meeting, every gate.		30 percent
Ravi Mechanical engineering lead. Owns the air model.		60 percent
Teodor Lab planner. Twenty-two science buildings behind him.		80 percent
Sunniva Design lead. Drew Tessenden.		100 percent
Keir Project architect, from first sketch to final punch list.		50 percent
Odalys Campus engagement. Runs all 14 sessions.		70 percent

Fifty-six months to first class.

Bellwick can stop at any gate. A gate is a signed drawing set, an updated cost, and a rerun of the air model with the meters we'd promise.



Five people have to read this and initial it.

A notebook page isn't finished until someone else has read it. Each of you gets a page with your question, our answer and something to test it with.

Marguerite, Provost

Will this hold the science enrollment we've told the trustees to expect?

Yes, and the way it does it is scheduling. Shared labs run 12 sections a week against 8 when a department holds the key, so the same room serves half again as many students.

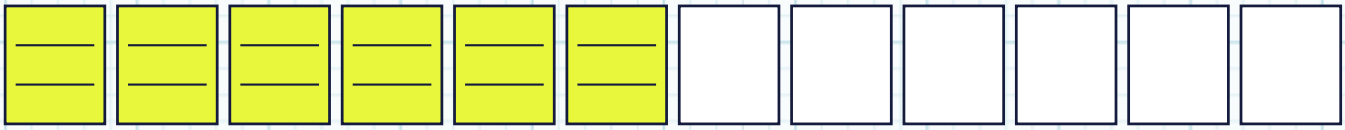
Read and understood by Initial here

Lab seats a week in 2031 — 1,650

Held by each department, 8 sections a week

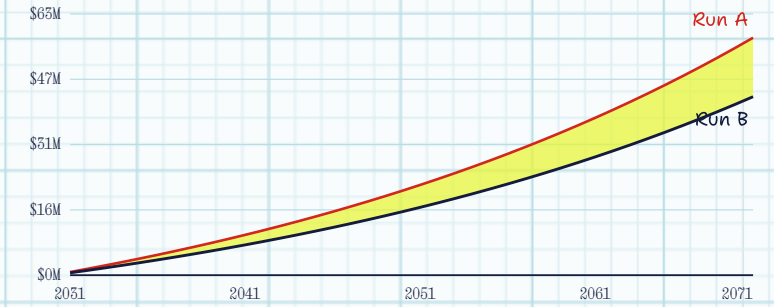


Shared, 12 sections a week



Shared, 1,650 seats fit in **6 labs**. Held by department they'd need **9**. That leaves 6 of the 12 for growth, and the ceiling is 3,456 seats.

Energy prices rise each year — 3 percent



Forty years at 3 percent, Run B spends **$14.14M** less on energy. Add the $5.35M it saves at construction and the gap's $19.49M.

Dominic, VP Facilities

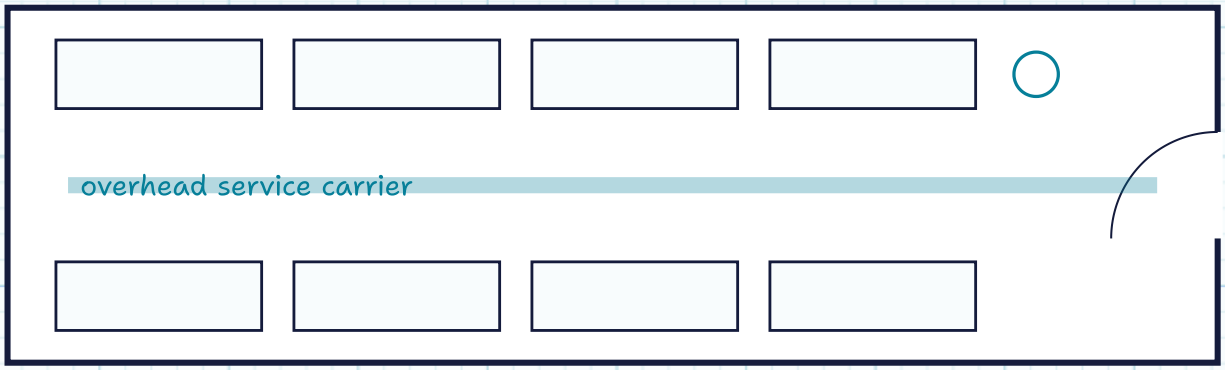
What does this cost me after the ribbon's cut?

Run B saves $187,531 a year in energy at today's rates, and costs $5.35M less to build than the campus standard. Pick your escalator and see forty years of it.

Read and understood by Initial here

Now wet biology | **Now synthetic chemistry** | Now instruments | Now computation

Next wet biology | Next synthetic chemistry | Next instruments | Next computation



plan, 10'-6" module pair, 30'-0" deep

Dark for **11 days** at **$29,000**. A fixed-bench lab like Anvers Hall takes 60 days and $200,000 for the same change.

Yusra, Dean of Science

When a chemist leaves and a biologist arrives, how long is that lab dark?

Services drop from an overhead carrier and benches roll. Hoods are the only fixed thing, and they sit in shared alcoves on the corridor side. Pick a turnover.

Read and understood by Initial here

Paolo, Faculty Chair

Will my colleagues be asked, or just told?

Fourteen sessions before the drawings freeze, a full-size mock-up lab on Quarry Lawn you can break, and a published list of what each group decides. Pick your group.

Read and understood by Initial here

Chemistry | Biology | Physics | Earth science | Students | Neighbors

Feb 2027	What Anvers Hall gets wrong	Mar 2027	Hood sharing, first conversation
Apr 2027	Mock-up lab opens on Quarry Lawn	May 2027	Mock-up, wet bench week
May 2027	Mock-up, physics and optics week	Sep 2027	Shared teaching labs and the registrar
Oct 2027	What students want at 9 p.m.	Nov 2027	Neighbors and the path during construction
Jan 2028	Instrument floor, vibration and access	Mar 2028	Hood alcove final vote
Apr 2028	Write-up rooms, who sits where	Jun 2028	Commons furniture on trial
Aug 2028	Move-in order, department by department	Oct 2028	Final walk through the drawings

Chemistry is in **10 of 14** sessions, and decides the hood alcoves and how they're shared. Decisions get published the same week.

Ines, Campus Sustainability Lead

Does this building fit inside the 2040 pledge, counting what it took to build?

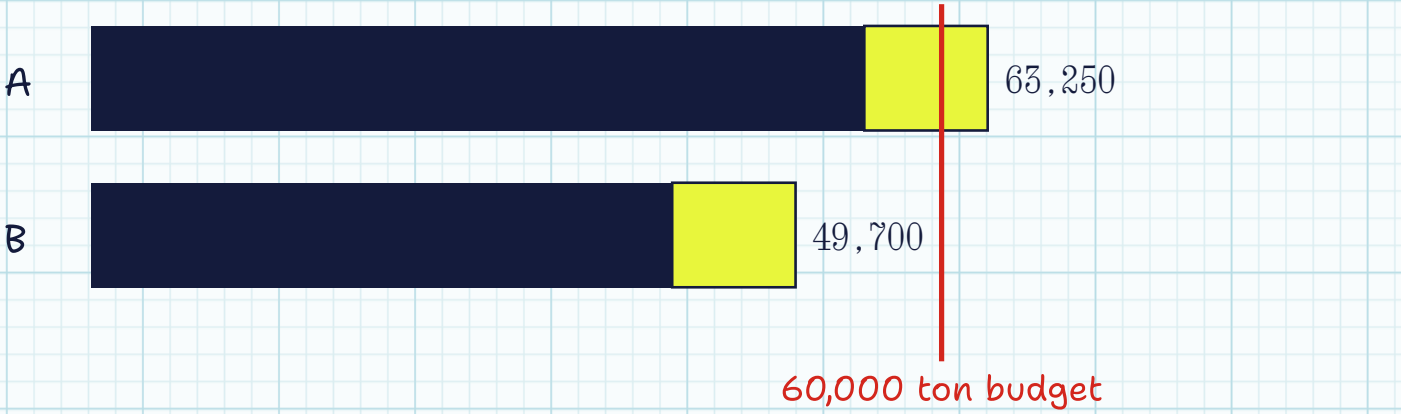
It does at Run B, and it doesn't at Run A. Your thirty-year budget for this building is 60,000 tons. Change the structure, the heating and the grid.

Read and understood by Initial here

Concrete frame | Steel frame | **Timber and steel hybrid**

Gas boilers for peak | All-electric heat pumps

Grid is cleaner by 2040 by **30 percent**



Run A and Run B. Ink is thirty years of running, highlighter is what it took to build.

Run B totals **49,700 tons**, 10,300 inside your budget. Run A is 3,250 over.

Fees by phase. Every line can come out.

Check or strike any line. A struck line stays on the page with what changes written beside it, the way a correction should.

Phases

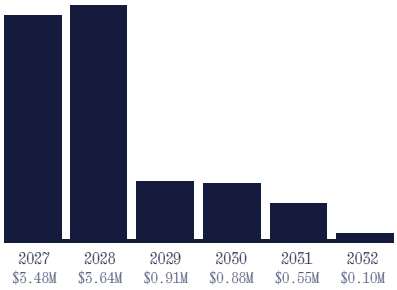
☑	**Programming and verification** We test the program against what the departments use today.	$420,000
☑	**Schematic design** Concept, massing, first air model. Ends at Gate 1.	$1,240,000
☑	**Design development** Systems fixed, mock-up tested, cost updated. Ends at Gate 2.	$1,860,000
☑	**Construction documents** The permit set. Ends at Gate 3.	$2,480,000
☑	**Bidding** Prequalifying and leveling trade bids with your construction manager.	$186,000
☑	**Construction administration** On site every week for 28 months.	$1,550,000

Scope you can drop

☑	**Lab planning and equipment coordination** Teodor and two planners, bench by bench.	$612,000
☑	**Air study and energy model** The run on this page, done properly, updated at each gate.	$248,000
☑	**Campus engagement program** All 14 sessions, led by Odalys.	$186,000
☑	**Full-size mock-up lab** One module on Quarry Lawn, from April 2027.	$94,000
☑	**First-year tune** A year of meters and fixes after opening, $105,000 held until they read true.	$210,000
☑	**Interiors and furnishings** Commons, write-up rooms, study rooms.	$318,000
☑	**Landscape at Quarry Lawn** The path, the lawn repair, the trees we move.	$164,000

$9,568,000

7.93 percent of the $120.63M Run B construction cost



We'd keep every line. If the committee needs one out, strike the interiors first, since Bellwick's own planners know that work. Keep the air study and the first-year tune. Those two are how the hypothesis gets proved.

Terms in plain language, and what we don't know yet.

How we bill	Monthly, against percent complete in each phase, net 30. Nothing's billed past a gate until you sign that gate.
Who owns the drawings	Bellwick does, once they're paid for. You can hand them to another firm at any gate.
If cost runs over	If bids come in more than 8 percent over the $124M budget, we redesign to budget at no extra fee.
The energy number	The first-year tune holds $105,000 of fee until the meters read within 10 percent of the model, or we've found out why.
Changes to the fee	The fee's fixed by line. A change in program over 5 percent of gross area reopens the affected phases, in writing, before work starts.
Insurance and licensing	Professional liability of $10M per claim. Licensed in the state, engineers of record on staff.

Open question. Your safety office hasn't ruled on 6 air changes for chemistry. If they hold at 8, Run B's air rises to 60,480 cfm. Construction still clears $124M, but carbon runs 108 tons a year over, and we'd have to find that elsewhere.

Open question. Do chemists accept shared hood alcoves at 3 people per hood? We'll test that on the mock-up, in front of them, in spring 2027.

Open question. Where does Anvers Hall's research go in 2031 and 2032? Decanting isn't in this fee because the answer may be that nothing moves until the new building opens.

Witnessed and signed.

The last page of the book. Your initials from the earlier pages carry over here.

Marguerite, Provost, Bellwick University

Dominic, VP Facilities, Bellwick University

Yusra, Dean of Science, Bellwick University

Paolo, Faculty Chair, Bellwick University

Ines, Campus Sustainability Lead, Bellwick University

Nell, Principal in Charge, Thole Ansty Architects — Nell

Select Thole Ansty for Bellwick | Ask us a question | Download PDF

Entry TA-2611-BU, valid through March 31, 2027

Book 1, last page

A Closewell Studio example. We never share client details, so this proposal is a mockup of how we design.

Want one built for your deal? Start a proposal