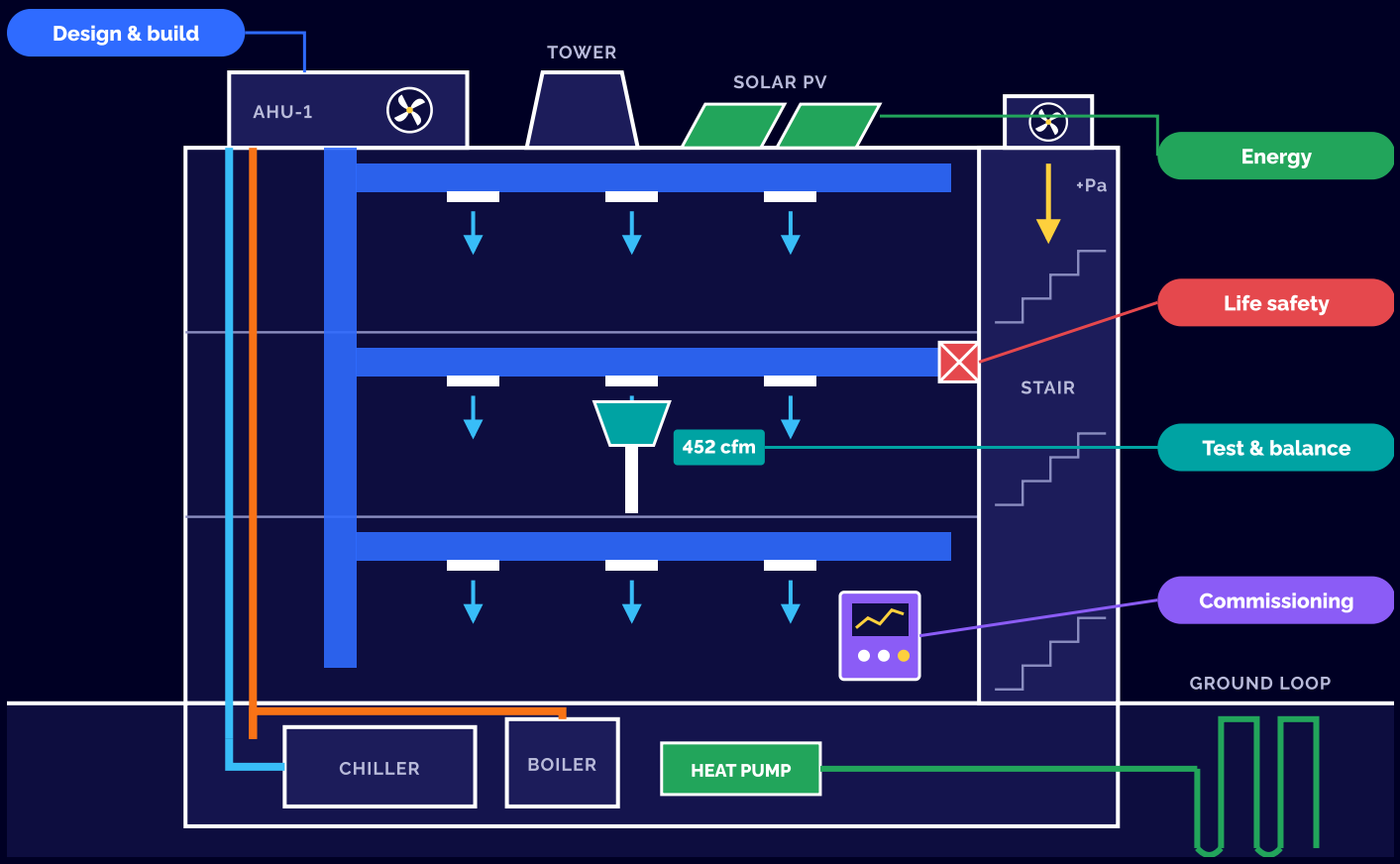
1-833-888-0091 | contact@hvacengineering.ca

HVAC Engineering Canada

We design, build and prove HVAC systems for Canadian buildings.

New HVAC design with architects and owners, design-build with one firm responsible, and the testing, balancing and commissioning that prove it works. From office towers and hospitals to data centers, cleanrooms and labs.



Four offices
Edmonton · Calgary · Vancouver · Toronto

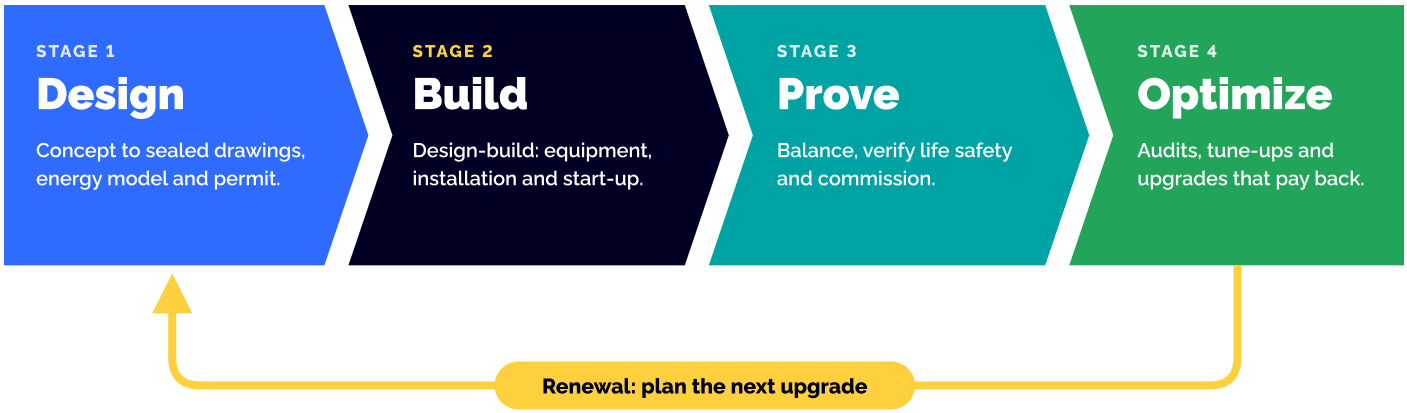
27 services · 9 industries
Commercial, institutional, mission-critical and residential

DESIGN	TEST	PROTECT	PROVE	OPTIMIZE
HVAC design and design-build	Testing, adjusting and balancing	Life-safety verification	Commissioning	Energy and sustainability

WHAT WE DO

One firm for the whole life of your HVAC system

We are mechanical engineers and field technicians. We design HVAC systems, build them, test and balance them, verify the life-safety systems, commission the building, and then help owners run it for less.



WHAT YOU HOLD AT THE END OF EACH STAGE

- **Sealed drawings** and specifications for permit and tender
- **A working system** installed, started and documented
- **Signed reports** balance, life-safety and commissioning results
- **Ranked upgrades** by cost, savings, payback and emissions

27 services in five groups

9 industries with their own solutions

4 offices across Western Canada and Ontario

246 free engineering guides on our site

±10% typical air terminal tolerance we report to

WHO WE HELP

Most clients come to us in one of these situations

Designing a new building or addition

You're an architect who needs a mechanical consultant, or an owner planning a project.

New HVAC design · Energy modeling

One firm to design and build it

One contract and one point of responsibility for design, installation, balancing and commissioning.

Design-build · Upgrades

Closing out a construction project

The balance report, fire damper and stairwell results your engineer and inspector ask for at turnover.

Testing and balancing · Life safety

A building that's uncomfortable or costly

Some floors too hot, others too cold, and the energy bill keeps climbing. We find out why and what to fix first.

Commissioning · Energy

A data center, cleanroom or lab

Mission-critical cooling, cleanroom classification and lab pressurization leave no room for guesswork.

Data centers · Cleanrooms · Air valves

A home that never feels right

An EnerGuide evaluation rates your home and recommends upgrades. Residential balancing evens out the rooms.

EnerGuide · Residential balancing

SERVICES AT A GLANCE

27 services in five groups

Each group ends in something concrete: drawings, a working system, or a signed report. Start with any one of them, or hire us for the lot.



DESIGN

HVAC design and design-build

9

New HVAC design
Mechanical design as part of your team

High-efficiency HVAC upgrades
Systems that cost less to run

Healthcare HVAC
Ventilation that protects patients

Data center cooling design
Uptime, density and efficiency

Critical airflow control
Venturi air valves for labs

HVAC design-build
Design, install, balance, commission

Building automation and BACnet
Open controls operators can use

Restaurant and kitchen HVAC
Exhaust and makeup air together

Cleanroom HVAC design
Airflow, filtration and pressure

YOU RECEIVE
Sealed drawings and specifications, or a complete installed, balanced and commissioned system.

TEST

Testing, adjusting and balancing

5

Air balancing (TAB)
Every terminal and fan to design

Duct leakage testing
Before the ceilings close

Residential air balancing
Even out hot and cold rooms

Water balancing (hydronic)
Every coil, pump and valve

Control system verification
Sensors, actuators, sequences

YOU RECEIVE
A balance report with design and measured flow for every terminal, coil and pump, plus instrument calibration dates.

PROTECT

Life-safety verification

3

Fire damper verification
Inspect and drop-test every damper

Fume hood certification
Face velocity, alarms, labels

Stairwell pressurization
Smoke-free stairs, doors that open

YOU RECEIVE
Pass or fail results with test conditions, readings and a list of deficiencies to correct.

PROVE

Commissioning

3

Building commissioning
New buildings work as the owner needs

Infrared thermography
Heat loss and leaks, walls closed

Retro-commissioning
Fix operating problems in existing ones

YOU RECEIVE
Functional test results and an issues log tracked through to close-out.

OPTIMIZE

Energy and sustainability

6

Energy audits
Where energy goes, what pays back

LEED consulting
Plan, document, certify

Solar PV systems
Feasibility, design and delivery

Energy modeling
Simulate a year before you build

EnerGuide home evaluations
Official rating and upgrade plan

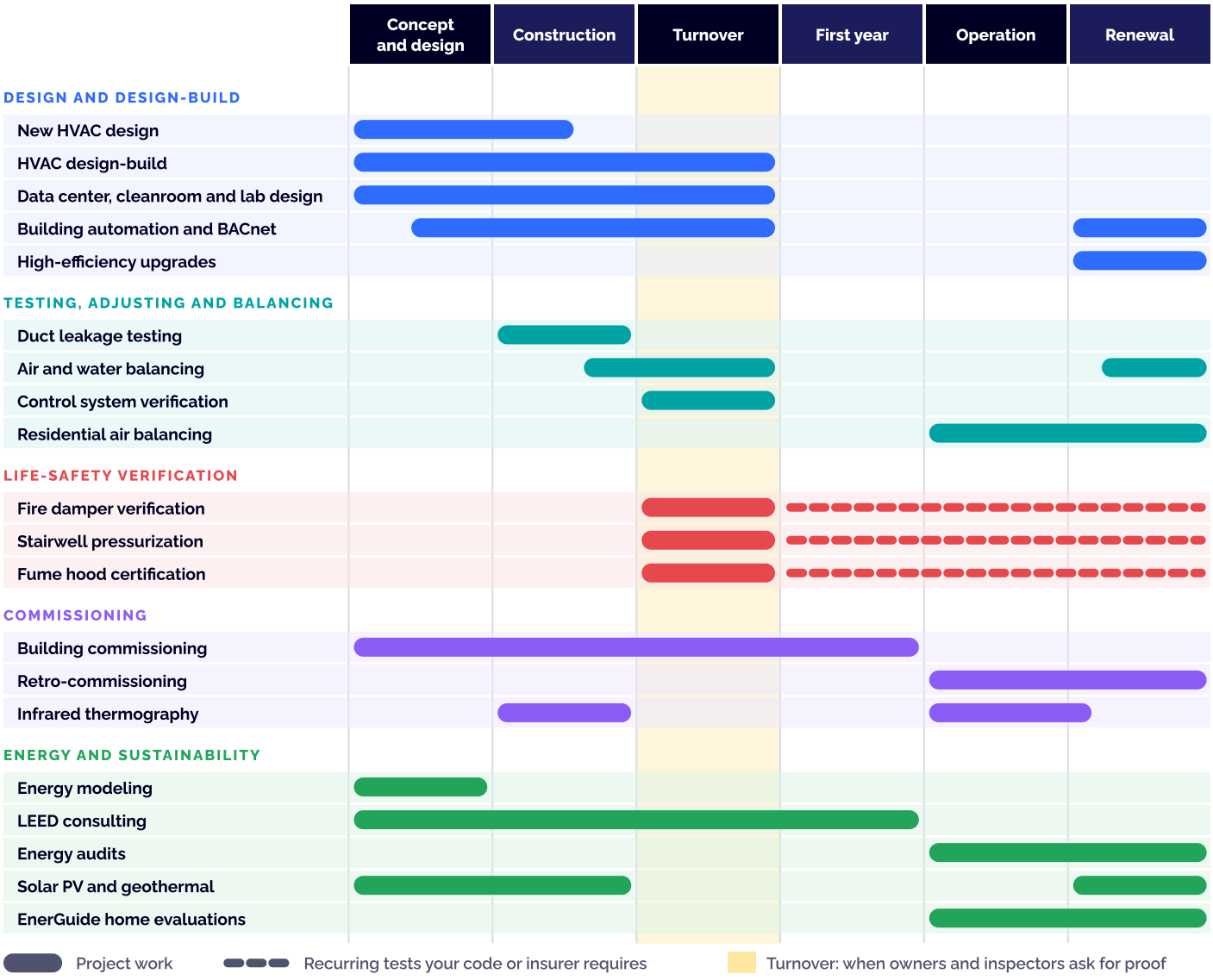
Geothermal heat pumps
Loop design to start-up

YOU RECEIVE
Upgrade options ranked by cost and payback, plus the modeling and paperwork certification programs require.

WHERE WE FIT

From the first sketch to the next upgrade

Many projects split this work across several firms. We cover all of it, so the people who designed the system are the ones who test it, and the people who test it understand how it was meant to work.



THE TURNOVER PACKAGE

What the engineer and inspector ask for before occupancy

Balance report
Design and measured flow, every terminal

Control checklists
Point-to-point and sequence tests

Fire damper records
Location, condition and drop test

Stairwell test report
Pressures and door forces by floor

Commissioning report
Functional tests and closed issues

O&M and training
Manuals, as-builts, operator sessions

Timing is typical. The project specification, your province's code and your insurer decide exactly what is required and when.

DESIGN AND DESIGN-BUILD · 9 SERVICES

New HVAC design, or one firm from drawings to start-up

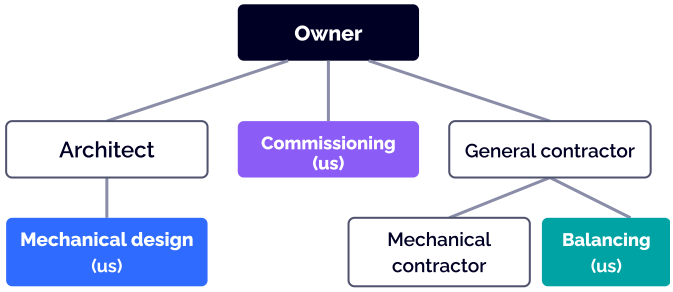
Hire us as the mechanical engineer on your design team, or let us design and build the whole system under one contract. Either way, balancing and commissioning are done by our own people.

HOW A DESIGN PROJECT RUNS

STEP 1 Concept	STEP 2 Schematic	STEP 3 Development	STEP 4 Documents	STEP 5 Handover
Owner requirements, budget, energy goals and system options.	System sizing, mechanical rooms, shafts and roof space coordinated with the architect.	Room-by-room loads, equipment selection, duct and pipe layout, energy model.	Sealed drawings and specifications for permit and tender.	Shop drawings, site review, balancing, commissioning and occupancy.

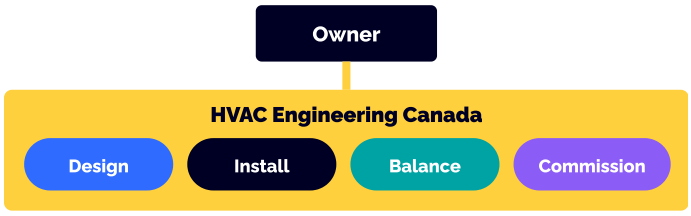
Two ways to work with us

DESIGN-BID-BUILD: WE ARE YOUR ENGINEER

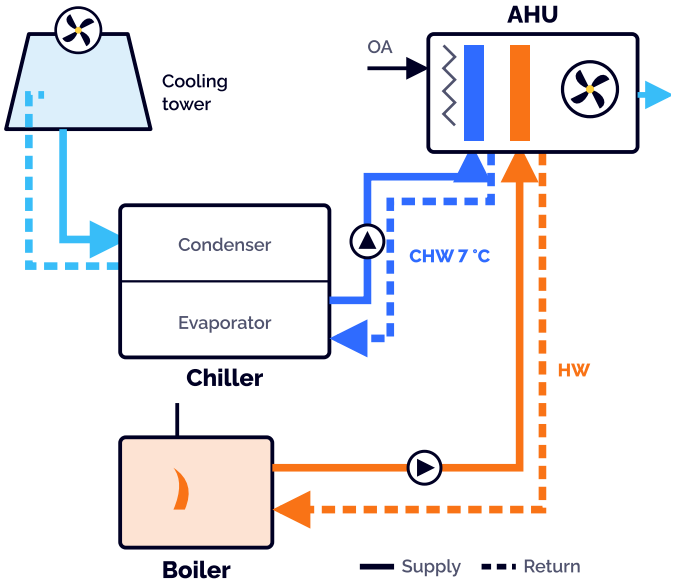


Several contracts. We can take any coloured box.

DESIGN-BUILD: ONE CONTRACT



A central plant we design and prove



SPECIALIST DESIGN

Healthcare HVAC
Air change rates, pressure relationships and filtration, verified.

High-efficiency upgrades
Options analysis with costs and savings, then the installed system.

Restaurant and kitchen HVAC
Kitchen exhaust and makeup air that work together.

Data centers and cleanrooms
Cooling for uptime and density; ISO 14644 cleanrooms. See page 10.

Building automation and BACnet
Open, integrated controls that operators can actually use.

Critical airflow control
Venturi air valves and room pressure control for labs and hospitals.

Designed to: National Building Code of Canada and provincial codes · NECB and ASHRAE 90.1 · ASHRAE 62.1 ventilation and 55 comfort · CSA Z317.2 for healthcare · NFPA 96 for kitchens

We measure every terminal and prove it matches the design

The same five steps whether it's one rooftop unit or a hospital wing. Balancing barely changes total airflow. It moves air to the rooms that were starved of it.

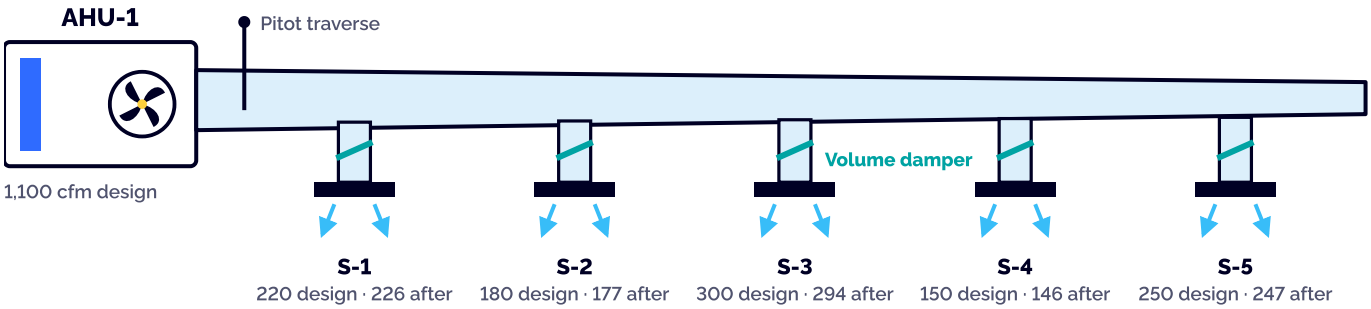
1 Review
We read the drawings, specs and submittals, and flag problems before we're on site.

2 Test
We measure airflow at every terminal and water flow at every coil and pump.

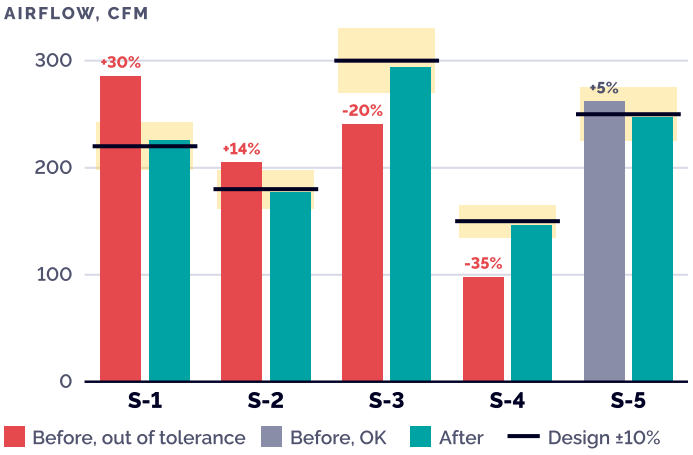
3 Adjust
We set dampers, balancing valves, fan speeds and control setpoints.

4 Verify
We re-measure until every reading falls within the specified tolerance.

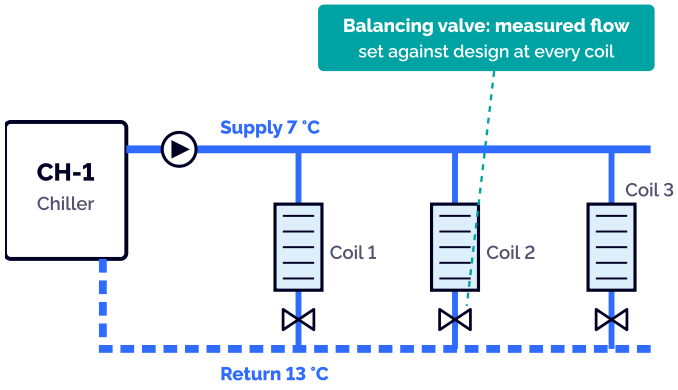
5 Report
A report your engineer, contractor and inspector can sign off on.



Air balance, level 3 east



Hydronic balancing



Same method for heating water and condenser water.

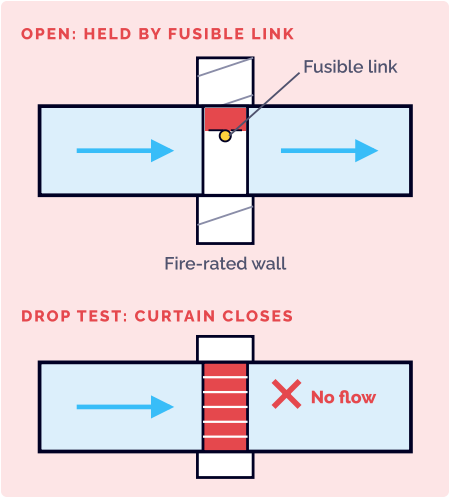
Air balancing (TAB)	Signed report with design and measured airflow for every terminal and fan
Water balancing (hydronic)	Design and measured flow at every coil and pump
Duct leakage testing	Measured leakage against the allowable rate, section by section, before ceilings close
Control system verification	Point-to-point checklists, sequence test results and a list of control deficiencies
Residential air balancing	Room-by-room readings before and after adjustment, with recommendations

Chart and readings are an illustrative example. Tested to the project specification, AABC or NEBB procedures, ASHRAE 111 and SMACNA leakage methods.

LIFE-SAFETY VERIFICATION · 3 SERVICES

Proof that the systems protecting people actually work

Fire dampers, stair pressurization and fume hoods sit idle until the day they matter. We test them, record the results and give you the list of what to fix before the inspector or the fire does.



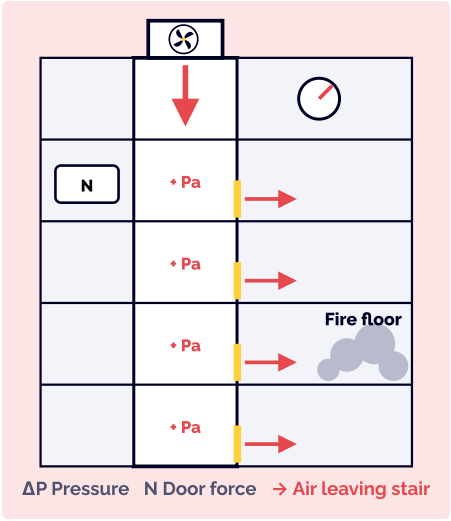
Fire damper verification

- Locate every damper on site
- Inspect access, link, blades and sleeve
- Release and drop-test, then reset

YOU RECEIVE

A damper inventory with the location, condition and test result of each damper.

To: National Fire Code of Canada, provincial fire codes, NFPA 80



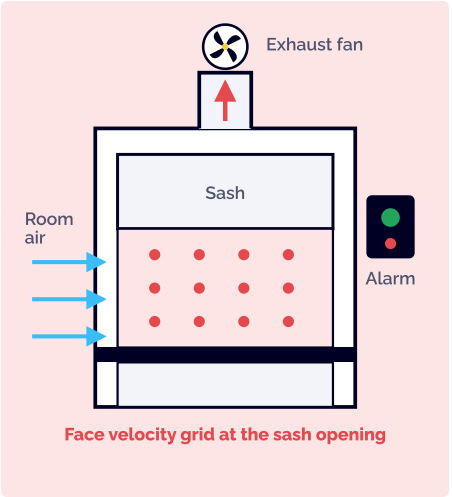
Stairwell pressurization

- Run the system in its fire-alarm mode
- Stair-to-floor pressure, every floor
- Door-opening force, every door

YOU RECEIVE

A report with pressure differentials and door-opening forces at each floor, plus the test conditions.

To: fire protection engineer's criteria, NBC and provincial codes, CAN/ULC-S1001



Fume hood certification

- Measure face velocity across a grid
- Smoke-test containment at the opening
- Check sash, airflow monitor and alarm

YOU RECEIVE

A certification label on each passing hood and a test report for every hood.

To: CSA Z316.5, ASHRAE 110 test method, ANSI/AIHA Z9.5

HOW EVERY LIFE-SAFETY TEST RUNS

Inventory → Inspect → Test → Tag → Report → Re-test

SAMPLE PAGE: FIRE DAMPER INVENTORY

ID	Location	Access	Drop test	Action
FD-01	Level 2 corridor, grid C4	Good	PASS	None
FD-02	Level 2 electrical room	Blocked	N/T	Add access door
FD-03	Level 3 shaft, grid F2	Good	FAIL	Replace link, re-test

SAMPLE HOOD LABEL

CERTIFIED

Hood FH-3 · Lab 214

Face velocity: measured, within spec

Alarm and monitor: tested

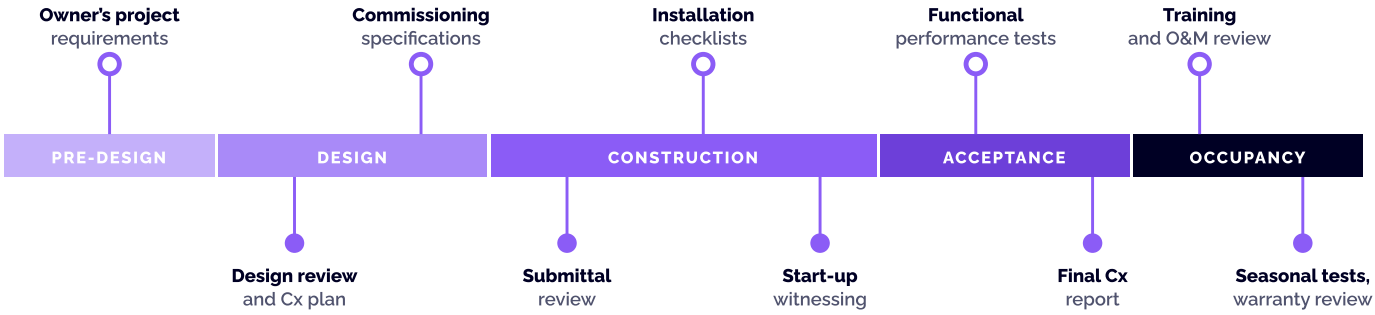
Tested to CSA Z316.5

Codes and test intervals vary by province. We test to the code that applies to your building and the criteria your fire protection engineer set.

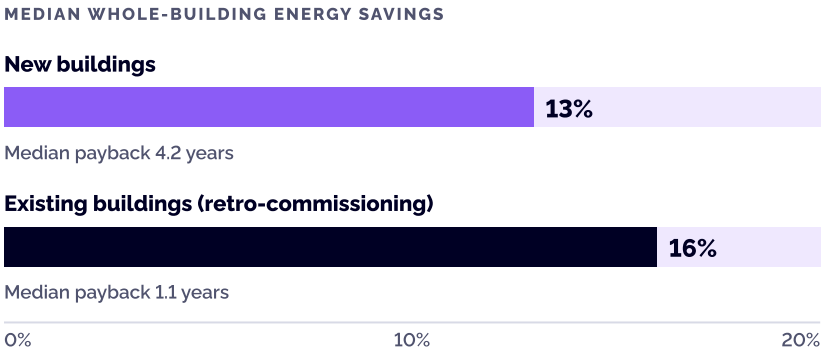
COMMISSIONING · 3 SERVICES

A building that runs the way the owner intended

Commissioning checks every system against the owner's requirements, from the first design review to a year after move-in. Retro-commissioning does the same for buildings already running.







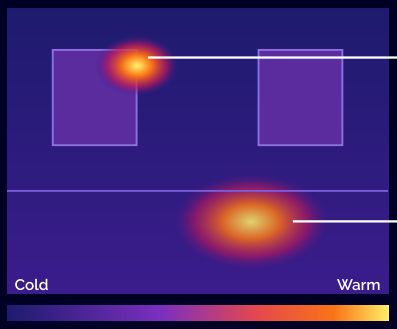
Source: Lawrence Berkeley National Laboratory, study of 643 U.S. buildings.

Retro-commissioning for existing buildings

Trend → Find → Fix → Verify

We trend the building automation data, find schedules, setpoints and sequences that waste energy or cause complaints, rank the fixes by cost and savings, then verify the results after the work.

Infrared thermography



You receive: a commissioning plan, functional test results, an issues log and a final report; for existing buildings, measures ranked by cost and savings with verification after the fixes; for thermography, thermal images paired with photos for each finding.

To: CSA Z320 building commissioning · ASHRAE Guideline 0 and 0.2 · CSA Z8001 for health care · LEED commissioning requirements · ASTM C1060 and ISO 6781 for thermography

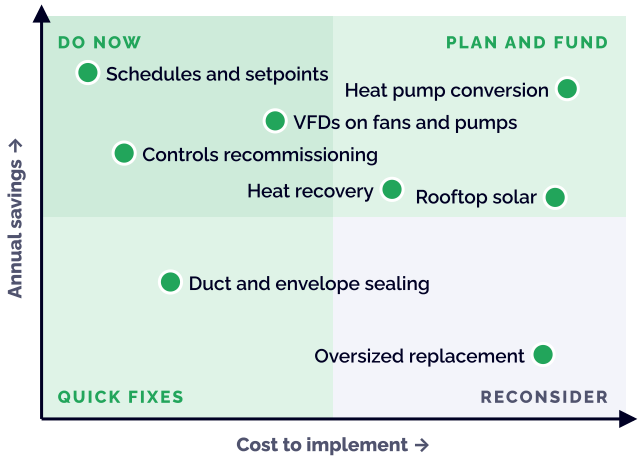
Find where the energy goes and what it's worth to fix

We audit existing buildings, model new ones before they're built, and document the results for LEED, EnerGuide and incentive programs. Then we design and deliver the upgrades, including solar and geothermal.

FROM UTILITY BILLS TO VERIFIED SAVINGS

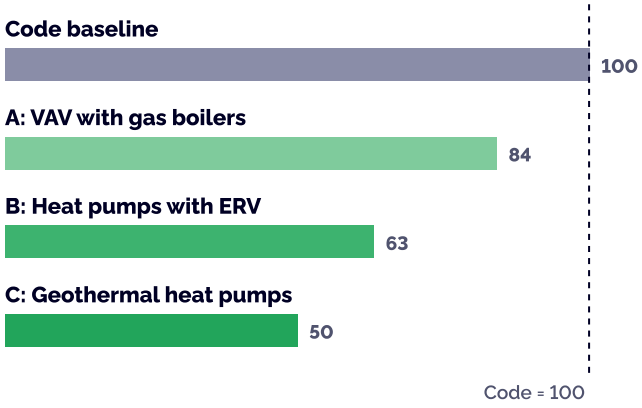
Utility data → Site survey → Baseline → Rank measures → Implement → Verify

ENERGY AUDITS RANK EVERY MEASURE



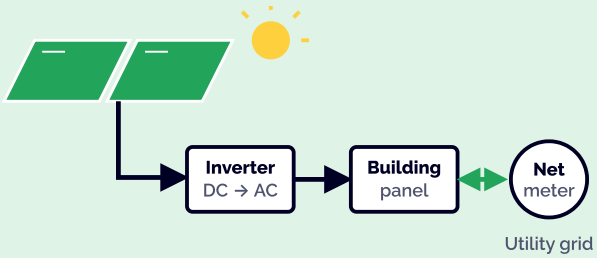
ENERGY MODELING COMPARES DESIGN OPTIONS

PREDICTED ANNUAL ENERGY, RELATIVE TO CODE



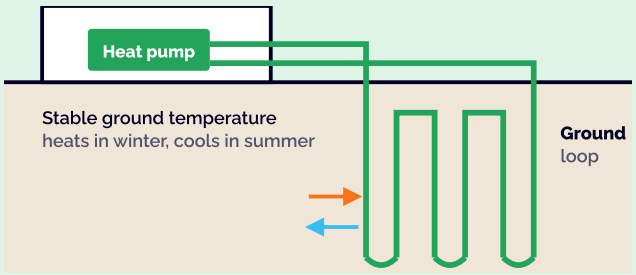
Both charts are illustrative. Your audit or model ranks your own building's options with real costs, savings, payback and emissions.

Solar PV systems



Feasibility study, system design, permits and an installed, commissioned system.

Geothermal heat pumps



Feasibility, loop and system design, and a commissioned installation.

LEED consulting

Credit strategy, scorecard, analyses and submitted documentation. LEED v5 through CAGBC.

EnerGuide home evaluations

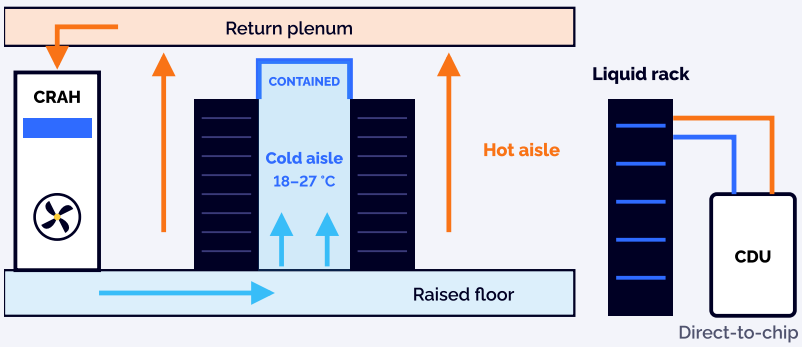
An official rating, label and renovation upgrade report, by an NRCan registered energy advisor.

Standards

ASHRAE 211 audits · NECB and ASHRAE 90.1 Appendix G · CSA C448 · CSA C22.1

Where a pressure reversal or a hot rack stops the business

Data centers, cleanrooms and labs leave no room for guesswork. We design them, test them and document them so your operator, certifier and regulator see the numbers.

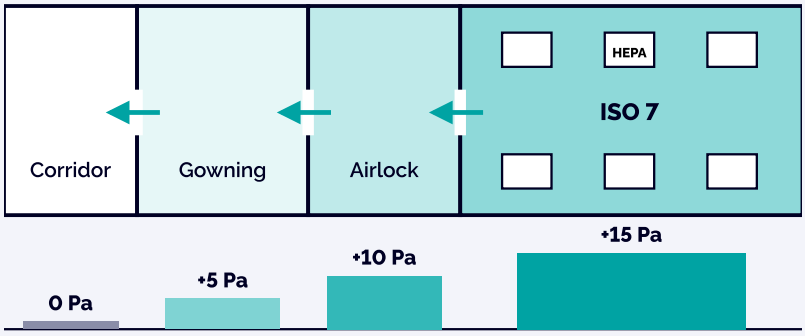


Data center cooling design

Air and liquid cooling designed for uptime, density and efficiency, from server rooms to full data halls and AI racks.

- Containment, chilled water and free cooling
- Redundancy strategy, load and CFD studies
- Direct-to-chip liquid cooling
- Integrated commissioning

To: ASHRAE TC 9.9 · ASHRAE 90.4 · NBC, NECB, CSA B52

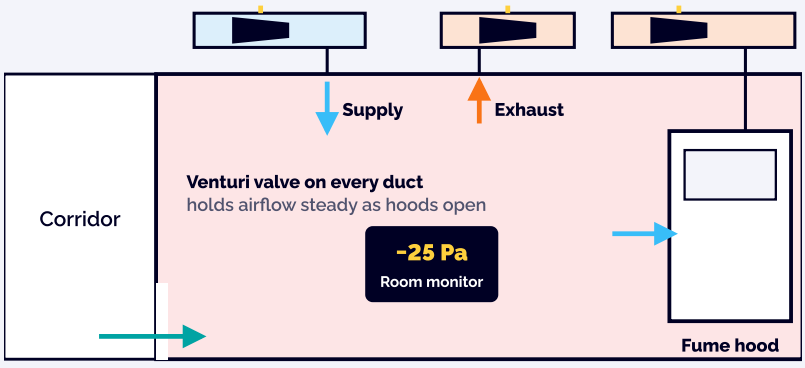


Cleanroom HVAC design

Airflow, filtration and pressure design for pharmaceutical, compounding and controlled manufacturing spaces.

- ISO 14644 and GMP classification
- HEPA filtration and air change rates
- Pressure cascades that hold with doors in use
- Testing support through certification

To: ISO 14644 · Health Canada GMP and EU GMP Annex 1 · USP <797> and <800>



Critical airflow control

Venturi air valves, fume hood control and room pressurization for labs, hospitals and vivariums.

- Valve schedules and control sequences
- Verified room offsets and face velocities
- Isolation room and OR pressure control
- Documented test report

To: CSA Z316.5 · ANSI/ASSP Z9.5 · CSA Z317.2 · ASHRAE 170. Covers venturi valves from manufacturers such as Antec, Phoenix and Accutrol.

Pressures and temperatures shown are typical design examples. Your criteria come from your process, your certifier and the standards that apply.

INDUSTRIES WE SERVE

Nine industries, each with its own codes and risks

Every sector runs its buildings differently. Here is what we do for each, and which of our service groups each one draws on.

INDUSTRY	WHAT WE DO THERE	DESIGN	BALANCE	LIFE SAFETY	COMMIS-SIONING	ENERGY
Pharmacies and compounding Compounding rooms that meet USP and NAPRA, with the pressures and air changes to prove it.	Compounding suite design · Design-build for tenant spaces · Pressure control and air valves · Balancing before certification · Commissioning and monitoring	●	●	○	●	○
Hospitals and healthcare Operating rooms, isolation rooms and clinics designed and verified to CSA Z317.2.	Healthcare HVAC design · Isolation and OR airflow control · Testing and balancing · Commissioning · Life-safety verification	●	●	●	●	○
Data centers Cooling design, containment and commissioning for server rooms up to full data halls.	Data center cooling design · Design-build · Integrated commissioning · Airflow balancing · Monitoring and controls	●	●	○	●	○
Industrial and manufacturing Process exhaust, make-up air and plant heating that protect workers and cut energy.	Ventilation and exhaust design · Design-build · Exhaust system testing · Energy audits · Thermography	●	●	○	●	●
Restaurants and food service Kitchen exhaust, make-up air and dining room comfort, designed and balanced together.	Restaurant HVAC design · Design-build · Air balancing · Equipment upgrades	●	●	○	○	○
Retail and shopping centres Tenant fit-outs, rooftop unit replacements and energy savings across a portfolio.	Tenant fit-out design · Design-build · Equipment upgrades · Air balancing · Energy audits and retro-commissioning	●	●	○	●	●
Warehouses and distribution Efficient heating, ventilation and destratification for big, tall buildings.	Heating and ventilation design · Design-build · Energy audits · Thermography · Rooftop solar	●	○	○	●	●
Schools and universities Healthy classrooms, safe labs and campus energy savings.	HVAC design · Commissioning · Retro-commissioning · Fume hood certification · Lab airflow control · Energy audits	●	○	●	●	●
Property managers and owners Fewer complaints, lower operating costs and life-safety testing done on schedule.	Retro-commissioning · Testing and balancing · Fire damper verification · Stairwell pressurization testing · Energy audits · Building automation	●	●	●	●	●

And for homeowners

EnerGuide evaluations rate your home's energy use and recommend upgrades. Residential air balancing evens out rooms that run too hot or too cold.

Don't see your building?

Arenas, labs, vivariums, offices and multi-unit residential follow the same method. Call us and we'll tell you which services apply.

START A PROJECT

Tell us about the building. We'll take it from there.

Send drawings, a specification or just a description of the problem. We scope the work, give you a fixed proposal, and finish with documents you can hand to an engineer, inspector or owner.

STEP 1

Call or request a quote

Phone, email or the form at hvacengineering.ca/quote.

STEP 2

We review the scope

Drawings, specs and submittals, or a site visit when the problem needs one.

STEP 3

Fixed proposal

Scope, schedule, standards and deliverables written down before we start.

STEP 4

Work and report

Calibrated instruments, design against measured, deficiencies listed.

FOUR OFFICES



WEST TO EAST, BY LONGITUDE

Vancouver
1021 West Hastings Street
Vancouver, BC V6E 0C3

Edmonton
34th Floor, 10180 101 St NW
Edmonton, AB T5J 3S4

Calgary
888 3rd Street SW
Calgary, AB T2P 5C5

Toronto
100 King Street West
Toronto, ON M5X 1A9

246 FREE GUIDES AT HVACENGINEERING.CA/GUIDES

- HVAC fundamentals and load calculations
- Air systems and air distribution
- Hydronic systems
- Chillers, boilers and central plants
- Rooftop units, VRF and packaged systems
- Ventilation and indoor air quality
- Controls and building automation
- Testing, balancing and commissioning
- Energy efficiency and decarbonization
- Data center cooling and HVAC design
- Cleanroom HVAC design
- Air valves and critical airflow control
- HVAC by building type
- Codes and standards in Canada
- Operations and maintenance

HVAC Engineering Canada
Design · Build · Test · Commission · Optimize

CALL
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hvacengineering.ca