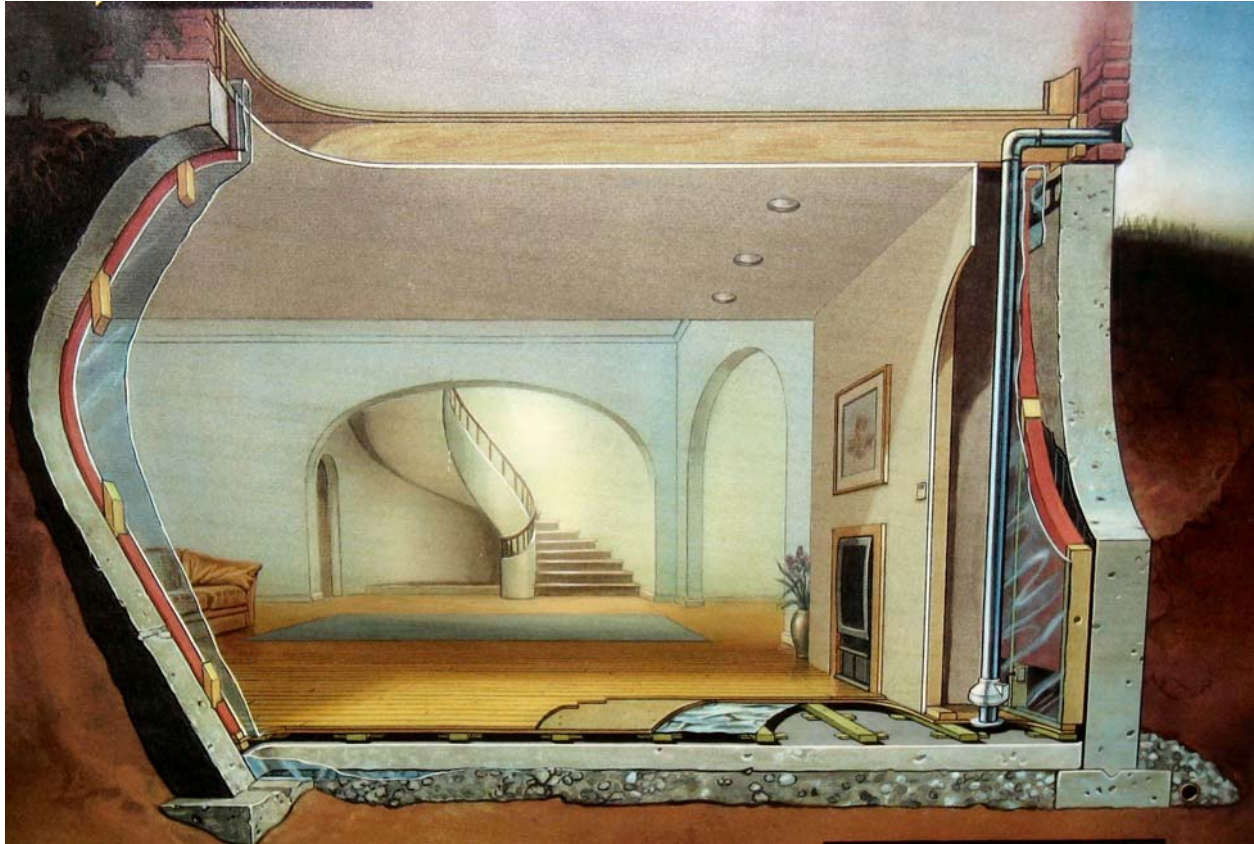


# The ECHO System

## The basement ventilated and drained insulation system

Engineered by Indoor Air Technologies Inc  
Constructed by Licensed Contractors in Canada and the USA

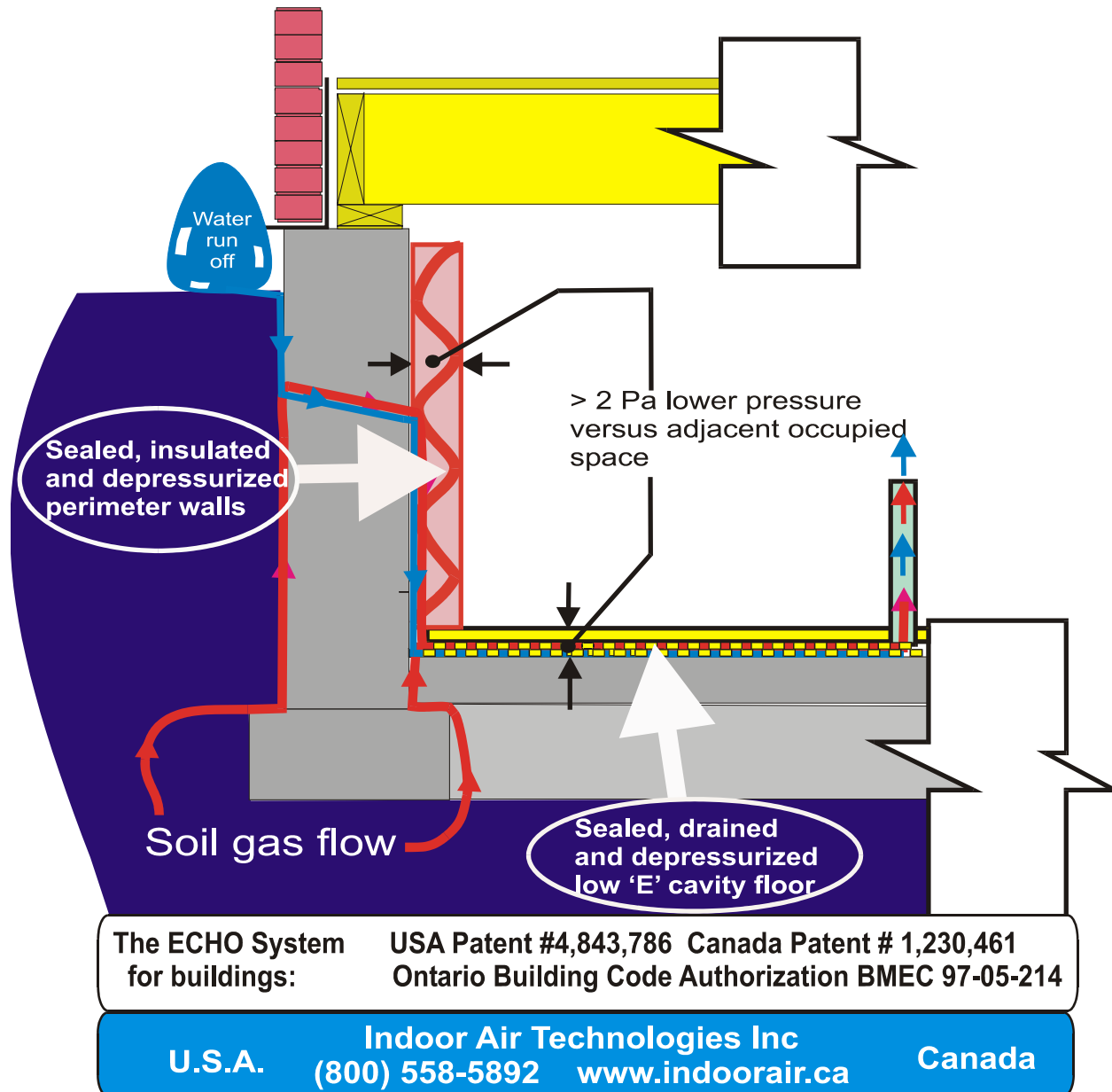


**The ECHO System™** is made up of specially constructed interior insulated and drained foundation walls and a low emissivity drained sub-floor. The System is ventilated and depressurized by a small continuous duty blower using less energy than a light bulb and removing more moisture than a dehumidifier at 1/10<sup>th</sup> the energy cost. A control panel houses a blower speed control, system differential pressure monitor, and commissioning certificate.

### Design options include:

- (I) Depressurized, drained and insulated-low emissivity ECHO combined wall/sub-floor system.
- (II) Depressurized and drained, low emissivity ECHO sub-floor.
- (III) Depressurized, drained and insulated ECHO perimeter walls.
- (IV) Any of (I) through (III) the above with basement water sump depressurization, sub-slab depressurization (SSD), and/or block wall depressurization.
- (V) Any of (I) through (IV) crawl space, cold room, and/or bathroom exhaust.

## Echo System construction



**ECHO System® construction.** Components are ventilated and depressurized perimeter stud walls and subfloors, a blower, a pressure/flow control panel, and a drainage system. ECHO System sub-floors are low emissivity and hollow. ECHO System stud walls are fully insulated without air gaps.

## The ECHO System solves basement moisture problems



**Concrete capillary moisture – ‘rising damp’ causes paint peeling.** Basement moisture problems include peeling foundation and floor slab paint, white concrete efflorescence, visible and hidden mold growth, and the typical basement odor.



## The ECHO System solves basement insulated construction moisture problems



**Rotting wood stud.** Sub soil perimeter insulated walls accumulate moisture whenever there is one or more of the following conditions: a) footings sitting in a high water table; b) a nearby flower garden; c) no or old weeping tile; d) winter time humidification. Above, a rotting wood stud in an insulated basement resulted from watering of a flower garden next to the foundation as well as a high water table. This basement was retrofit with the ECHO System ventilated insulation system and the moisture problem resolved.

## The ECHO System solves foundation water leakage problems



**Foundation crack.** The ECHO System ventilation and drainage solves typical minor foundation water leakage problems from foundation cracks, such as the one shown above, more certainly than any other approach, including application of exterior water sealing membranes, saving costly excavation and water sealing work outside the foundation. The ECHO System is approved as an interior foundation drainage system under the Ontario building code.

**ECHO System finishing solves concrete block foundation dampness, leakage and soil gas entry**



**Concrete block air leaks.** These porous foundations provide sites for mold growth and a network of passageways for water ingress and soil gas entry to the block cavities, and multiple small openings into the basement and upstairs, drawn in by building stack pressures. Stack pressures act whenever the house is warmer than outdoors. ECHO System coverage can offset these stack pressures and eliminate this avenue of contaminant entry through porous grout fillings.



## ECHO Systems solve stone foundation moisture and mold problems



**Stone foundations** are major sources of basement dampness and mold growth in the stone interstices. Finishing such basements with the ECHO System produces major basement air quality and comfort improvements.

## The ECHO System ventilated subfloor



**Ventilated ECHO subfloor.** The ECHO sealed and ventilated subfloor is less than 1-3/4" thick. Two thirds of the floor cross section comprises a low emissivity air cavity. Water can safely flow through this cavity to an interior drain if there is extensive foundation water leakage or a flood.



## The ECHO System ventilated, insulated wall



**ECHO Wall.** The ECHO sealed and ventilated stud wall is fully and tightly insulated, and the normal insulated stud wall thickness of 4 inches. However, unlike normal insulated walls, ECHO walls do not have energy robbing convection currents and damp insulation. In the ECHO wall, controlled ventilation keeps insulation dry and any water ingress or condensation can safely run down the foundation wall behind the insulation to the floor where it is quickly ventilated and/or drained away.

The ECHO System prevents basement water drainage sump contamination of indoor air



**Basement sumps** are a principal source of house air contaminants. Their water, if stagnant, becomes a microbial amplification site. The pipe(s) into the sump from perimeter foundation weeping tiles inject soil humidity and gases such as radon and microbial VOCs and spores into the sump and from there into the house air itself. The ECHO System eliminates this problem by venting the sump air directly to the outdoors.

The ECHO System eliminates crawl space contamination of house air



**Crawl space hatch with HVAC ducts and ECHO exhaust duct (white PVC).** Crawl spaces with dirt floors are a principal source of house air fungal spores and gases. The ECHO System can be used to eliminate this problem.



## The ECHO System exhaust mechanism



**ECHO Blower, PVC piping and sump tube.** The complete perimeter stud wall and subfloor assembly is exhausted to the outside by a continuous duty blower. The System is pressure-tested and leaks sealed before drywall installation. This ensures complete venting of the wall-floor assembly at the lowest possible exhaust rates for the System layout and foundation type.

## Venting the ECHO System exhaust



**The ECHO System exhaust** is vented outdoors like a dryer vent. The ECHO System exhaust air temperature is typically ~ 15C (60F), so it will melt nearby snow in winter, and provide energy savings for a nearby air conditioner or heat pump.

## The ECHO System control panel

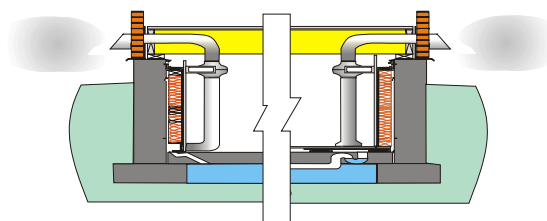


The **ECHO System control panel** provides the System registration number assigned by Indoor Air Technologies to the Commissioned system. It contains the ECHO blower speed control and the pressure differential monitor. The pressure indicator in this photograph shows an ECHO System depressurization relative to the basement air of 16 Pascals. This depressurization is more than adequate (2 Pascals is adequate) to remove concrete 'rising damp' and soil contaminant gases.



## ECHO System Commissioning Certificate

## ECHO™ Subfloor & Perimeter Stud Wall Water Drainage & Air Exhaust System



Installation address.....

.....Registration number.....

The ECHO System is protected by Canadian patent #1,230,461 and USA patent # 4,843,786  
Ontario Building Code approved as foundation wall drainage & insulation (BMEC 97-05-214, July 31, 1997)



### System Depressurization

|                     | SYSTEM EXHAUST RATE |     |         |     |         |     |
|---------------------|---------------------|-----|---------|-----|---------|-----|
|                     | Low =               | L/s | Medium= | L/s | High =  | L/s |
| ECHO System (>1 Pa) | .....Pa             |     | .....Pa |     | .....Pa |     |
| Sub-slab.....       | .....Pa             |     | .....Pa |     | .....Pa |     |
| Block walls.....    | .....Pa             |     | .....Pa |     | .....Pa |     |
| Sump.....           | .....Pa             |     | .....Pa |     | .....Pa |     |

ECHO System house ventilation rat (max) .....L/s

Crawl space exhaust (max) .....L/s, depressurization.....Pa

Washroom: continuous (>10 L/s) .....L/s or intermittent (>25 L/s).....L/s

House depressurization (check< 5 Pa if no makeup air duct for furnace & DHW).....Pa

Fans on: .....  
e.g. kitchen fan, dryer, bathroom, ECHO fan, crawl space fan, furnace fan

Commissioned by ..... \*\*

name printed ..... Date...../...../.....

Contractor .....

\*\*Indoor Air Technologies Inc. ONLY

## indoor air technologies inc.

Phone (800) 558-5892 [www.indoorair.ca](http://www.indoorair.ca)

**Commissioning certificate.** After the drywall is installed, the System is commissioned and certified, setting the minimum exhaust rate for continuous enclosure venting, and higher rates for house ventilation and dehumidification.

**Basement air quality with the ECHO System is as good or better than that of the air upstairs**



**Exercise room in an ECHO Basement.** An ECHO System basement provides healthy air with lower than normal concentrations of typical basement indoor air pollutants. Good air quality is an obvious necessity for an exercise space where respiratory rates and susceptibility to air contaminants are considerably higher.

## Basements are more comfortable with the ECHO System



**Play and office area in an ECHO basement.** An ECHO System basement with its dry insulation and ventilated subfloor is more thermally comfortable and better ventilated than the normal finished basement. It provides an ideal location for a children's play area, an exercise room, an office and an entertainment center.



## Basement offices are more productive with the ECHO System



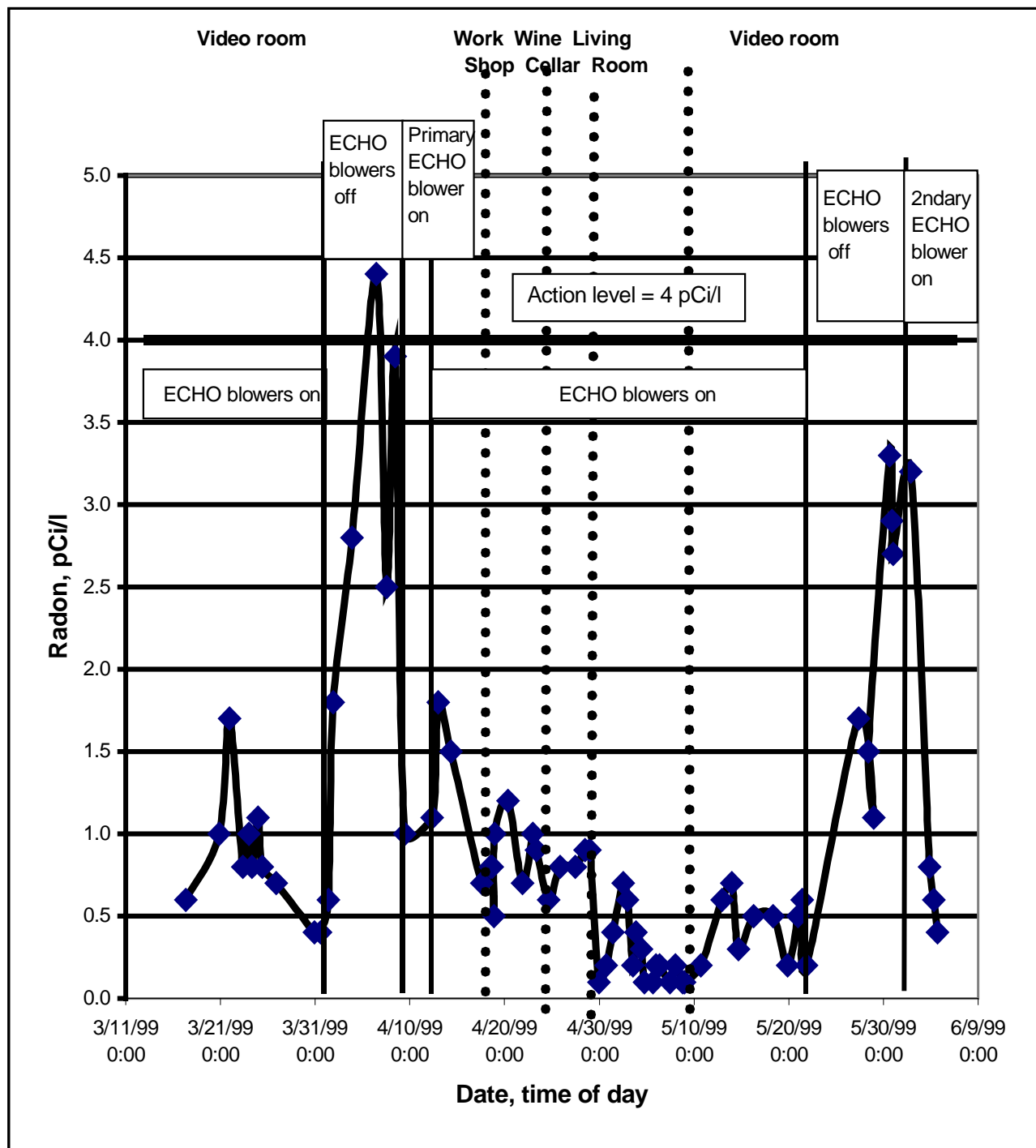
**Office in an ECHO Basement.** The healthy basement air provided by the ECHO System makes for higher office productivity. The ECHO System provides the humidity control, air quality, and floor thermal comfort for the ideal home office environment. ECHO envelope depressurization eliminates basement humidity, odors and radon; ECHO low emissivity floors and fully insulated walls optimize thermal comfort and energy efficiency.

## The ECHO System Protects Your Investment



**Hardwood floor in an ECHO basement.** Over half of ECHO System basement installations include hardwood flooring. The ECHO System protects your investment: through system drainage, dehumidification and material isolation from the concrete. With the ECHO System, a warm, beautiful hardwood floor is now practicable and safe.

## ECHO System operation reduces radon exposures



ECHO System operation reduces radon exposures in this house where it has been constructed from over 4 pCi/L to near outdoor levels of 0.5 pCi/L.



## What do ECHO homeowners say?



Here is what this client said about his ECHO System. “ I would like to express our gratitude for the wonderful improvement to our basement air quality from installing your "Echo System" in our basement. The quality of the space has been transformed. From a dank, musty space we now have a fresh, smell free and pollution free environment that is a pleasure to spend time in. It does not feel like a basement anymore. We are truly pleased to have come across your system. Thank you.” Ven. Saigyo Shuso, [www.wwzc.org](http://www.wwzc.org). For other client testimonials return to ‘ECHO Basement’ ‘Testimonials’.