

1. What is the Problem?

Task Force on School Construction

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Washington State Board of Health

General Codes Don't Fit Schools

- Kids are different
 - More active
 - Higher respiration
 - Bodies developing (nervous system, lungs)
 - Poor judgment (myelination of the brain is incomplete)
- Schools are different
 - Population density
 - Level of activity
 - Construction type
 - Surface areas and clutter (dust)
 - Captive audience
 - On school days, kids may spend majority of waking time there

Site Assessment

Phase I ESA (ASTM Standard)

Soil Sampling if Needed

Report and Consultation

Jennie Reed Elementary School, Tacoma



California law has banned schools within 500 feet of a freeway since 2003.

Proposed Religious Elementary, Olympia



Small planes would have been completing their landings and turning around immediately adjacent to the proposed playground.

Riverside High School, Chattaroy



New wing of the school was evacuated in 2000. Water was coming in around the windows but groundwater was also seeping up through the concrete pad.

Site Assessment

- Examples of issues encountered:
 - School built over drainage swale—ongoing moisture problems
 - School planning to purchase rural site that would not have accommodated onsite septic
 - School planning athletic field that would have torn up its drainfield
 - Schools built on potentially contaminated sites (brownfields, orchards, former missile sites)
- Federal law mandates guidelines within the year
- Phase I ESA common practice/due diligence

Indoor Air Quality

Location of Air Intakes
Ducted Returns (No Open Plenums)
Avoid Degradable Duct Lining
Cleanable and Dryable Flooring

Artondale Elementary, Gig Harbor



Dust, mold, and poor ventilation prompted school closure for two months in 2002. Students and staff complained of rashes, itchy eyes, sinus problems, breathing difficulties, headaches. Cleaning the school cost \$400,000.

Examples of “Sick” Schools

- Decatur High School, Federal Way
- Vashon Island High School
- Roy Elementary School
- A Highline District elementary school
- Cle-Elum-Roslyn High School

Seattle Survey of School IAQ

- Public Health—Seattle & King County surveyed 83 schools in 13 districts
 - All used hazardous chemicals; 51% toxic
 - 80% had notable dust and clutter
 - 47% showed signs of water damage
 - More than half had rooms with blocked ventilation
 - 82% had at least one room with more than 1,000 ppm of carbon dioxide; 39% had high CO₂ levels in 10% to 20% of rooms
 - Only one in 83 had vented laminators

Asthma

- Washington State asthma rates are among the highest in nation (increasing)
- Washington asthma related costs for school children \$253 million per year
- In a 30-student classroom, three are likely to have asthma
- Asthma is leading cause of absenteeism (14 million missed school days per year)

Asthma (continued)

- With 1 million school children you would expect three deaths, 10,000 ER visits, and 10,000 physician office visits annually.
- International studies say IAQ interventions are likely to reduce symptoms 20%-60%
- First environmental intervention: Clean, remove, and/or replace carpets.

Ephrata High School, Ephrata



Students Carly LaPlant and Mary Senn received a Special Achievement Award for Student Involvement from the EPA Tools for School Program. A teacher developed health problems attributed to fiberglass particles from deteriorating duct lining and ceiling panels.

IAQ and Particles

- Vast majority of IAQ complaints are particle related
- Symptoms include fatigue, scratchy throat, foggy-headedness, nausea, tightness of the chest, itchy eyes, rash, respiratory ills (flu, colds, asthma), sinus problems
- 15%-30% of complaints related to glass fibers, total level of particles in the air (Microlab Northwest)

Fall Prevention

Exterior Railings

Stage Warning Strips

Orchestra Pit Railings

Marshall Middle School, Olympia



Children regularly play on this 6.5 foot tall, 6 inch wide railing while waiting for rides home from after-school activities. Horseplay is not uncommon.

Lewis & Clark High School, Spokane

Victim dies 10 years after fall

Jundt plunged down high school stairwell at age of 14

By Richard Wagoner
Staff writer

A lot of people had forgotten about John Jundt. It's been nearly a decade since his 45-foot fall down an open stairwell at Lewis and Clark High School ended his budding stage career and sparked a multi-million dollar lawsuit against Spokane Public Schools.

His parents died in the meantime. His brother, Jim Jundt, was last heard of in Alabama. In recent years, the only regular visitors to his room at Interlake School in Medical Lake were his court-appointed guardian and a woman hired as his companion.

"I think everyone I talked with was surprised he was still alive," said John Lynch, a Spokane lawyer and Jundt's guardian.

On Monday, Jundt was buried in Holy Cross Cemetery in a ceremony that attracted about 50 friends, former classmates and workers from Interlake, a state facility for the severely disabled.

He died from respiratory failure early last Wednesday, said Theresa Reisenauer, a social worker at Interlake. He was a 14-year-old freshman when he fell in September 1980. He was 23 when he died.

Lynch plans to use what is left from the settlement in Jundt's lawsuit to establish a foundation to help other people who are disabled by severe head injuries.

"There is goodness and sadness that came out of his case," said Lynch, "and I think this is one of the good things that can be done . . . There was meaning to his life. He wasn't written off."

At Monday's funeral, some people remembered the plucky red-haired kid who won roles in Spokane Civic Theatre productions and was a soloist with the choir at



Sacred Heart Roman Catholic Church.

Others knew the disabled young man who, unable to walk or talk, showed only a hint of understanding with an occasional blush or movement of a finger.

"Just exactly how much understanding he had, we had no way of knowing," Reisenauer said.

"I felt that John paid attention when I was around, and I spoke to him as if he was fully cognizant of what I had to say."

One moment of understanding came last October when, at a performance at The Met, Jundt attempted to applaud, Reisenauer said. The performance was one of several he attended with Interlake staffers.

Jundt's mother, Janet, died in 1984. His father, Hubert, died three years later. Lynch said he believes both died of cancer.

There are no other family members in the Spokane area, he and Reisenauer said.

"I think that what happened to John had something to do with his parents dying so early," Lynch said. "If you could have seen John, you would understand why. If that's your child, it's very hard."

Lynch has been unable to locate Jundt's older brother to tell him about the death. Jim Jundt was in Alabama when Lynch last heard from him a couple of months ago.

Two years after the accident, Jundt's family won an out-of-court settlement against Spokane Public Schools worth an estimated \$8.5 million over a 20-year period. The money covered Jundt's medical bills and his ongoing care at Interlake.

It was being distributed in large, sporadic payments and smaller, monthly checks, Lynch said.

About \$600,000 has accumulated in a trust fund that will be converted to a foundation to benefit the head-injured, he said. The ongoing payments of at least \$4,500 a month also will go to the foundation, Lynch said.

John Jundt fell from an open banister in 1980. Blind, unable to speak, a quadriplegic, he lived nine years. The district had settled two previous lawsuits

Olympia High School, Olympia



Shortly after installation during a 1999 remodel, a student actor in *Anything Goes* fell into this orchestra pit and was on crutches for several days.

Atlanta Ballet



High school student Leah Boresow, fell 12 feet into the orchestra pit during a December performance of *The Nutcracker*. She required spinal surgery. OSHA fined the ballet \$3,500 in June for a “serious” violation.

Playground Safety

Equipment Meets ASTM Standard
Installed as Recommended

Various Schools, Spokane Region

Protrusion Hazards



- Torso Protrusion Hazard



- Eye Socket Protrusion Hazard



- Skin Protrusion Hazard

Various Schools, Spokane Region

Entanglement Hazards



- Gaps, spaces, or hooks that entangle clothing and cause strangulation
- Gaps and spaces at the tops of slides
- Open "S" hooks
- Free hanging ropes

Playground Safety

- Spokane Regional Health District conducted safety audit of school playgrounds in 1997
 - Almost 700 hazards found at just 23 elementary schools
 - 227 hazards that could result in death (head entrapments, entanglements, no resilient surfacing material, recalled equipment, etc.)
 - 472 hazards that could result in serious injury or permanent disability (protrusions, inadequate resilient surfacing material, inadequate barriers, inadequate maintenance – rotting structural elements, etc.)

Playground Safety (continued)

- 2.2 million children under 14 suffer school-related injuries nationally—for younger children most are playground related.
- 200,000 ER visits per year nationally for playground-related injuries (mostly school)
- Estimated \$43 million per year for cost of school playground-related injuries per year in Washington State (mostly medical).

Lab and Shop Safety

Emergency Eyewashes & Showers
Handwashing & Drying Facilities
Emergency Shutoffs & Magnetic Switches
Not Recirculating Air to Other Parts of School

Lab and Shop Safety

- Total injuries at school annually 4 million (ages 5-19).
- Approximately 7% of these occur in shops

2. Consideration of Implementation Difficulties

Board Has Already Responded

- HVAC provisions delayed three years
- Wipeoff mat requirement removed
- Plenum restrictions for new buildings and additions with standalone ventilation
- Late add-ons with costs not accepted
- Changes to venting requirements for office equipment

Elementary (current DOH estimates)

Phase 1 ESA	\$ 7,700.00	\$ 0.12
Soil sampling and analysis	\$ 6,000.00	\$ 0.09
Consult with LH during design	\$ 3,480.00	\$ 0.05
Written report to LH regarding site assessment	\$ 3,000.00	\$ 0.05
Work with LH in predevelopment	\$ 3,460.00	\$ 0.05
Increased cost for preoccupancy inspection	\$ 200.00	\$ 0.00
Carpet upgrade	\$ 64,350.00	\$ 0.99
Potential health room costs	\$ -	\$ -
Exterior railing and other fall hazard measures	\$ 43,394.00	\$ 0.67
Situate air intakes away from sources of contaminants	\$ 1,940.00	\$ 0.03
Upgrade duct lining or use sound chambers	\$ 63,504.00	\$ 0.98
Use ducted air returns	\$ 98,280.00	\$ 1.51
Playgrounds meet national standards	\$ 20,866.00	\$ 0.32
Work with local health on playground plans	\$ 1,800.00	\$ 0.03
		\$ 4.89

Elementary (current DOH estimates with adjustments)

Phase 1 ESA	\$ -	\$ -
Soil sampling and analysis	\$ -	\$ -
Consult with LH during design	\$ 3,480.00	\$ 0.05
Written report to LH regarding site assessment	\$ 3,000.00	\$ 0.05
Work with LH in predevelopment	\$ 3,460.00	\$ 0.05
Increased cost for preoccupancy inspection	\$ 200.00	\$ 0.00
Carpet upgrade	\$ 64,350.00	\$ 0.99
Potential health room costs	\$ 11,198.00	\$ 0.17
Exterior railings and other fall hazard measures	\$ 43,394.00	\$ 0.67
Situate air intakes away from sources of air contaminants	\$ -	\$ -
Upgrade duct lining or use sound chambers	\$ 49,130.00	\$ 0.76
Use ducted air returns	\$ 98,280.00	\$ 1.51
Playgrounds meet national standards	\$ -	\$ -
Work with local health on playground plans	\$ 1,400.00	\$ 0.02
		\$ 4.28

Elementary (current DOH estimates with adjustments and sorted)

Use ducted air returns	\$ 98,280	\$ 1.51	\$ 1.51
Carpet upgrade	\$ 64,350	\$ 0.99	\$ 2.50
Upgrade duct lining or use sound chambers	\$ 49,130	\$ 0.76	\$ 3.26
Exterior railing and other fall hazard measures	\$ 43,394	\$ 0.67	\$ 3.93
Potential health room costs	\$ 11,198	\$ 0.17	\$ 4.10
Consult with local health during design	\$ 3,480	\$ 0.05	\$ 4.15
Work with local health in predevelopment	\$ 3,460	\$ 0.05	\$ 4.20
Written report to local health regarding site assessment	\$ 3,000	\$ 0.05	\$ 4.25
Work with local health on playground plans	\$ 1,400	\$ 0.02	\$ 4.27
Increased cost for preoccupancy inspection	\$ 200	\$ 0.00	\$ 4.28
	\$ 277, 892	\$ 4.28	1.7%

Middle School (DOH estimates with adjustments and sorted)

Use ducted air returns	\$143,640.00	\$ 1.51	\$ 1.51
Upgrade duct lining or use sound chambers	\$ 88,906.00	\$ 0.94	\$ 2.45
Carpet upgrade	\$ 78,375.00	\$ 0.83	\$ 3.27
Exterior railing and other fall hazard measures	\$ 70,232.00	\$ 0.74	\$ 4.01
Installing and plumbing additional emergency showers	\$ 47,628.00	\$ 0.50	\$ 4.51
Installing and plumbing additional eyewashes	\$ 30,240.00	\$ 0.32	\$ 4.83
Installing emergency shutoffs	\$ 28,350.00	\$ 0.30	\$ 5.13
Installing hand washing facilities	\$ 19,051.00	\$ 0.20	\$ 5.33
Potential health room costs	\$ 11,198.00	\$ 0.12	\$ 5.45
Providing ventilation systems that do not recirculate	\$ 4,536.00	\$ 0.05	\$ 5.50
Work with local health during predevelopment	\$ 3,460.00	\$ 0.04	\$ 5.53
Written report to local health regarding site assessment	\$ 3,000.00	\$ 0.03	\$ 5.56
Providing electro-magnetic power switches	\$ 2,430.00	\$ 0.03	\$ 5.59
Consulting with local health during design	\$ 1,740.00	\$ 0.02	\$ 5.61
Increased cost for preoccupancy inspection	\$ 600.00	\$ 0.01	\$ 5.61
	\$533,386.00	\$ 5.61	2.5%

High School (DOH estimates with adjustments and sorted)

Use ducted air returns (no open plenums)	\$ 340,200.00	\$ 1.51	\$ 1.51
Upgrade duct lining or use sound chambers	\$ 165,110.00	\$ 0.73	\$ 2.25
Carpet upgrade	\$ 148,500.00	\$ 0.66	\$ 2.91
Exterior railing and other fall hazard measures	\$ 92,231.00	\$ 0.41	\$ 3.32
Installing and plumbing additional emergency showers	\$ 74,844.00	\$ 0.33	\$ 3.65
Install eyewashes	\$ 47,520.00	\$ 0.21	\$ 3.86
Installing emergency shutoffs	\$ 44,550.00	\$ 0.20	\$ 4.06
Installing hand washing facilities	\$ 29,937.00	\$ 0.13	\$ 4.19
Potential health room costs	\$ 11,198.00	\$ 0.05	\$ 4.24
Providing ventilation systems that do not recirculate	\$ 4,536.00	\$ 0.02	\$ 4.26
Work with local health in predevelopment	\$ 3,460.00	\$ 0.02	\$ 4.28
Providing electro-magnetic power switches	\$ 3,240.00	\$ 0.01	\$ 4.29
Written report to local health regarding site assessment	\$ 3,000.00	\$ 0.01	\$ 4.30
Consult with local health during design	\$ 1,740.00	\$ 0.01	\$ 4.31
Increased cost for preoccupancy inspection	\$ 1,000.00	\$ 0.00	\$ 4.32
	\$ 971,066.00	\$ 4.32	1.7%

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Vader Elementary, Vader, Lewis County



Building inspector condemned in 2005. Lewis County does not inspect schools

Eckstein Middle School, Seattle



The ceiling of the boys' locker room collapsed between 4 pm and 5 pm, April 2008—but was it anything other than poor construction from the 1950s?

Nathan Hale High School, Seattle



Consultants looking for mold noted indoor air quality problems because the windows were closed and *the ventilators had been turned off.*

High Hazard Pesticide Use

13 High Hazard Pesticides

High Hazard	Product Name	Active Ingredient(s)	Amount Used	Carc	Endo	Neuro	Repro/ Dev
☠	Drione	piperonyl butoxide; silica gel; pyrethrins	43 oz	X		X	
☠	Gallery	isoxaben	52.5 lbs	X			
☠	Norasac	dichlobenil	150 lbs	X			
☠	Surflan	oryzalin	19 gallons.	X			
☠	Casaron	dichlobenil	12 lbs	X			
☠	Pendulum	pendimethalin	19.5 qts.	X			
	Razor	glyphosate	73.18 gallons.				
☠	Crossbow	2,4-D; triclopyr	80 oz	X	X		
☠	Stinger	phenothrin; tetramethrin	24 cans	X		X	
☠	Wasp Freeze	d-trans allethrin; phenothrin	13 oz			X	
☠	565 Plus	pyrethrins; d-trans allethrin, piperonyl butoxide; n-octyl bicycloheptene dicarboximide	32 1/2 oz	X		X	
	Terro Ant Kill	borax	8 oz plus 32 c.c.s.				
☠	Tempo	cyfluthrin	1 gallons 91 oz			X	
☠	Tempo SC-Ultra	cyfluthrin	17 gallons 15 oz			X	
☠	BP-100	pyrethrin; piperonyl butoxide; n-octyl bicycloheptene dicarboximide	15 oz	X		X	
	B. t. Briquets	bacillus thuringiensis	60 Briquets				

Of 50 responding districts, 96% use pesticides linked to cancer, nervous system damage, reproductive or developmental harm, or hormone disruption (WTC, 2004). Does not include “homemade” pesticides Agriculture reports as common.