

**Portland Public Schools  
ANALYSIS, DESIGN & COMMISSIONING**

**ENGINEERING SERVICES**

Owner/Client:

Portland Public Schools  
PO Box 3107  
Portland, OR 97208-3107  
Catherine Diviney (503) 916-2000  
Sean McGinnis (project manager)  
(503) 654-2336

1<sup>st</sup> Project Start:

August 1994

Project Finish:

on-going

Facility Type:

Educational (K-12)

Construction Cost (Total):

NA

Construction Cost (EESI Portion):

NA

Engineering Fees:

NA

EESI Staff Involved: Fred Shaub, Steve Barney, John Balaam, Skip Hamilton, Tim Thatcher, Randy Boyd, Dan Pullen, Pete Sanford, Ron Anderson

Project Description: Under contract since 1994, EESI has completed energy studies at 94 sites and design services for 79 sites. HVAC and conservation upgrades/design included: lighting upgrades, building automation system (BAS) installation, attic insulation, pipe & duct insulation, summer hot water heaters, pool heat recovery, thermostatic radiator valves, return air upgrade, return air ductwork, new boilers, boiler optimizations, and burner upgrades.

Abernathy Elementary  
Ainsworth Elementary  
Alameda Elementary  
Arleta Elementary  
Astor Elementary  
Atkinson Elementary  
Ball Elementary  
Beach Elementary  
Beaumont Middle  
Benson High  
Binnsmead Middle  
Boise Eliot  
Bridger Elementary  
Bridlemile Elementary  
Brooklyn Elementary  
Buckman Elementary  
Capital Hill Elementary  
Chapman Elementary  
Central Facilities Building  
Chief Joseph Elementary  
Child Service Center  
Clarendon Elementary  
Clark Elementary  
Cleveland High  
Columbia Holding  
Creston Elementary  
Duniway Elementary  
Edward Elementary  
Faubian Elementary  
Fernwood Middle  
Forest Park Elementary  
Franklin High  
George Middle  
Glencoe Elementary  
Glenhaven High Vocational  
Village

Grant High  
Gray Middle  
Gregory Heights  
Grout Elementary  
Hayhurst Elementary School  
Hollyrood Elementary  
Hosford Middle  
Humboldt Elementary  
Irvington Elementary  
Jackson Middle  
James John Elementary  
Jefferson High  
Kellogg Middle  
Kelly Elementary  
Kenton Elementary  
King Elementary  
Lane Middle  
Laurelhurst Elementary  
Lee Elementary  
Lent Elementary  
Lewis Elementary  
Lincoln High  
Llewellyn Elementary  
Madison High  
Maplewood Elementary  
Markham Elementary  
Marshall High  
Mary Rieke Elementary  
Marysville Elementary  
Meek Elementary  
Metropolitan Learning  
Center  
Monroe Holding Facility  
Mt. Tabor Middle  
Ockley Green Middle  
Peninsula Elementary

Portsmouth Middle  
Richmond Elementary  
Rigler Elementary  
Roosevelt High  
Rose City Park Elementary  
Sabin Elementary  
Sacajawea Elementary  
Scott Elementary  
Sellwood Middle  
Sifton Elementary  
Skyline Elementary  
Smith Elementary  
Stephenson Elementary  
Sunnyside Elementary  
Tubman Elementary  
Vernon Elementary  
Vestal Elementary  
West Sylvan Middle  
Whitaker  
Whitman Elementary  
Wilcox Elementary  
Wilson High  
Woodlawn Elementary  
Woodmere Elementary  
Woodstock Elementary  
Youngson

**Portland Public Schools Technical Assistance Studies  
ENERGY ANALYSIS**

**ENERGY**

Owner/Client:

Portland Public Schools  
PO Box 3107  
Portland, OR 97208-3107  
Bill Robbins (503) 916-200 x 4414

Project Start:

January 1999

Project Finish:

June 2000

Facility Type:

Educational

Building Age:

Chapman - Built 1923  
Columbia - Built 1937  
Madison - Built 1958

Engineering Fees:

\$27,600

Project Size:

Chapman 62,962 sf  
Columbia 102,209 sf  
Madison 370,112 sf

EESI Staff Involved: Steve Barney, John Balaam, and Pete Sanford.

Project Description: Provide energy studies for Chapman Elementary School, Columbia Facility, and Madison High School.

Energy conservation measures included:

Chapman Elementary School

Building automation system  
Classroom ventilation fan VFD  
Pipe & boiler feed tank insulation  
Repair Annex time clock  
Thermostatic control valves  
Lawn sprinkler water meter  
Refrigeration water sub-meter

Columbia Facility

Building automation system  
Thermostatic control valves  
Ceiling insulation  
Gymnasium lighting upgrade  
Mixed air controller

Madison High School

Building automation system  
Lighting upgrades  
Kitchen steam modifications  
Thermostatic valves  
Return air duct for kitchen  
Re-sheave classroom fans  
Boiler #4 to serve kitchen  
Refrigeration water sub-meter

The purpose of these reports was to identify and evaluate energy conservation measures for each school. The reports were developed in compliance with the Energy Analysis Guidelines for the Oregon Department of Energy (ODOE) and meet the requirements of Step 2 of the ODOE Small Scale Energy Loan Program (SELP). To qualify for SELP financing, the estimated annual energy savings must meet or equal the annual loan payment.

**Cleveland & Roosevelt Boiler Upgrades  
MECHANICAL DESIGN**

**ENERGY UPGRADES**

Owner/Client:  
Portland Public Schools  
PO Box 3107  
Portland, OR 97208-3107  
Bill Robbins (503) 916-200 x 4414

Project Start: January 2000  
Project Finish: December 2000  
Facility Type: Educational  
Building Age: Cleveland - Built 1929  
Roosevelt - Built 1921  
Construction Cost: \$59,400<sup>†</sup>  
Engineering Fees: \$20,000  
Project Size: Cleveland 253,895 sf  
Roosevelt 264,5442 sf

<sup>†</sup> Roosevelt only

EESI Staff Involved: Fred Shaub, Ron Phelps, and John Wallin.

Project Description: Boiler upgrade design for Roosevelt and Cleveland High Schools. Cleveland was postponed for a later project. Roosevelt included replacing heavy oil burners with new burners for gas in three existing Kawanee scotch marine boilers. The boiler upgrades were driven by energy, maintenance, and environmental impact of buried oil tanks and air pollution due to burning heavy oil.

**Energy Studies @ 54 Schools**  
**SB1149 ENERGY STUDIES**

**ANALYSIS**

Owner/Client:  
Portland Public Schools  
PO Box 3107  
Portland, OR 97208-3107  
Catherine Diviney (503) 916-2000

Project Start: January 2003  
Project Finish: April 2005  
Facility Type: Education (K-12)  
Building Age: 1909 to 1988  
Engineering Fees: \$215,850  
Project Size: 4,458,440 square feet

EESI Staff Involved: Fred Shaub, Ron Anderson, Steve Barney, Suzanne Marinello, Leslie Collicott, Peter Sanford, Connie Kenning, & Kelly Guenther.

Project Description: Energy studies provided under SB1149 guidelines and format.

Studies identified building envelope upgrades, heating & ventilation system energy upgrades, and lighting system upgrades. All studies included the highest level 3 assessments. Assessed Energy Efficiency Measures (EEMs) included energy use modeling, construction cost estimates, and detailed descriptions of existing building conditions.

EESI has completed SB1149 energy studies for the following PPS schools:

Abernathy Elementary	Creston Elementary	Lent Elementary
Ainsworth Elementary	Duniway Elementary	Lewis Elementary
Alameda Elementary	East Sylvan	Llewellyn Elementary
Arleta Elementary	Fernwood Middle	Maplewood Elementary
Astor Elementary	Forest Park Elementary	Markham Elementary
Atkinson Elementary	Franklin High	Marshall High
Ball Elementary	Glencoe Elementary	Mary Rieke Elementary
Beach Elementary	Grant High	Marysville Elementary
Benson High	Gray Middle	Meek Elementary
Binnsmead Middle	Grout Elementary	Metropolitan Learning Center
Bridger Elementary	Hayhurst Elementary School	Mt. Tabor Middle
Brooklyn Elementary	Hollyrod Elementary	Ockley Green Middle
Buckman Elementary	Hosford Middle	Rigler Elementary
Capital Hill Elementary	Irvington Elementary	Scott Elementary
Chief Joseph Elementary	Jackson Middle	Sunnyside Elementary
Clarendon Elementary	James John Elementary	Woodmere Elementary
Clark Elementary	Jefferson High	Woodstock Elementary
Cleveland High	Laurelhurst Elementary	

## **HVAC Assessments**

Owner/Client:

Portland Public Schools  
PO Box 3107  
Portland, OR 97208-3107  
Catherine Diviney (503) 916-2000

Project Start:

December 2005

Project Finish:

On-going

Facility Type:

Education (K-12)

Building Age:

1909 to 1988

EESI Staff Involved: Fred Shaub, Ron Anderson, Steve Barney, Peter Sanford, & Kelly Guenther.

Project Description: Portland Public Schools (PPS) has several schools with comfort complaints due to deficient or old HVAC equipment. PPS has initiated an "Energy Efficiency Retrofit Program" to investigate the causes and provide a list of recommended maintenance, repairs, or HVAC upgrades to bring the comfort conditioning systems into current ventilation code compliance and upgrade the mechanical systems for efficient operation.

PPS contracted with EESI due to their extensive hands on experience in HVAC system assessments and retrofit design of all types of building mechanical systems.

EESI has provided HVAC troubleshooting services for the following PPS schools within the past year:

- Bridlemile Elementary School
- Madison High School
- Rigler Elementary School
- Scott Elementary School
- Woodstock Elementary School

As a result of the assessments, EESI has provided HVAC upgrade design project for the above schools.

Boiler upgrade for Bridlemile Elementary School (completed fall of 2006).  
BAS upgrade including demand ventilation and boiler upgrade at Rigler Elementary School (boilers completed fall of 2006 and BAS upgrade in construction).

Comprehensive upgrade at Woodstock Elementary School involving refurbishing unit ventilators, new control valves on fan coils, DDC upgrades, conversion of oil fired firebox boiler with gas fired burners and firebox optimization (completed summer of 2006).

New boilers and upgrade of DDC system including addition of VFD drives for demand ventilation at Madison High School (boilers in final construction and BAS upgrade out to bid).