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High-Performance School Buildings

2014

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School Facilities and Organization
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Executive Summary

The School Facilities and Organization section of the Office of Superintendent of Public Instruction (OSPI) manages the High-Performance School Building Program. The program is a result of the Revised Code of Washington Chapter 39.35D, which requires that state-assisted major building projects be built to a high-performance or green-building standard. The requirements are part of the School Construction Assistance Program, also administered by OSPI.

Since the law took effect in July 2006, 219 public school projects have been reviewed for applicability with the requirement. Of that total, 155 projects are designed and built, or are being built, to meet a high-performance standard. This includes major modernizations and additions, as well as new construction. Three projects are exempt due to size and building type. Sixty-one requests were made and granted a not-practicable exemption. All of the not-practicable exemptions are for projects that are partially funded by school district bonds passed prior to June 2009, with one exception for a historic building exemption.

This report, due by September 1 of each even-numbered year (beginning in 2006 and ending in 2016), combines all school district reports on high-performance credits earned, as well as project costs of compliance and annual operations. Results in this report are based on data provided by districts that reached reporting milestones during 2013 and 2014. In summary:

- Schools are earning credits that focus on natural resource conservation and indoor environmental quality and comfort that have a direct relationship to providing a healthy, safe learning environment.

- There is no "typical" project-to-project or district-to-district incremental cost to build a high-performance school. Reported costs range from a deferred cost of $39 per square foot to an additional cost of $26 per square foot.

- Recent Washington schools are designed to be more energy efficient than the EPA-reported national median for K–12 schools; in many cases, as much as 50% below the median.

- Energy metering on a school campus is not always by individual building. This makes it difficult to compare the actual energy use of a high-performance building to the designed energy use and to national energy use benchmarks.

- Projects with high-performance materials, systems, and features are receiving performance comments from the users that include, "excellent improvements," "paint not durable," "expensive to maintain" and "comfort control is excellent."

The requirements for state-assisted public schools to design and construct to a high-performance green building standard is achievable. The correlation between high-performance schools and student achievement, or student and staff wellness, and staff retention has not been studied by OSPI. However, the positive links between classroom design and learning have been published and will continue to be studied by experts.

Introduction

Chapter 39.35D RCW, High-Performance Public Buildings, requires that all state-assisted new construction or modernization projects at state-owned and K–12 facilities over 5,000 square feet are designed and built to a high-performance, green building standard. A high-performance building is one that achieves a high level of energy and resource efficiency, reduces its impact on the environment, and provides a healthy and comfortable indoor environment.

School districts with new construction and modernization projects that meet the thresholds for compliance must periodically report their progress of incorporating high-performance standards into the design and construction. Additional reporting of actual operating performance is required annually for five years following local school board acceptance or project occupancy. The School Facilities and Organization section of OSPI manages the reporting requirements of the High-Performance School Building Program.

The statute requires OSPI to consolidate district reports into one report for the Washington State Governor and the Legislature in September of each even-numbered year beginning in 2006 and ending in 2016. The purpose is to inform the Governor and Legislature about meeting legislative intent to save money, improve school performance and productivity, to report on incentives and disincentives of the high-performance building program, and to provide recommendations about the ongoing implementation of the chapter.

The high-performance school requirements were phased in over a period of three years: 1) volunteer projects prior to 2006, 2) projects in large school districts that had not received project approval from OSPI prior to July 1, 2007, and 3) projects in small districts that had not received project approval from OSPI prior to July 1, 2008.

Large districts, called Class I districts, have more than 2,000 full-time equivalent students, and smaller districts, called Class II districts, have less than 2,000 full-time equivalent students. All of the school projects that fell within a phase-in group have either completed, or fallen out of, the building process by now.

As of July 2008, all approved projects must comply with the high-performance building requirements unless an exemption is applicable. The most notable exemption is “not practicable–bond date” which allows an exemption for projects using local district funding from bonds that were voter approved prior to June 2008 for Class I districts and June 2009 for Class II districts (Table 1). Most current projects applying for State Construction Assistance passed bonds more recently than 2008 and 2009, making it likely that fewer districts will request this exemption.

Table 1: Compliance Dates for High-Performance Schools

Project Type	Effective Date	Bond Date Exemption
Volunteer School Districts	July 1, 2006	
Class One School Districts	July 1, 2007	June 2008
Class Two School Districts	July 1, 2008	June 2009

In 2008, OSPI's High-Performance Schools report to the Legislature, written by OSPI and O'Brien & Company, reported on data collected from the 18 volunteer-grant projects that began in 2006. OSPI's 2010 and 2012 reports provided an update of the changes to the High-Performance Schools Program and project outcomes during those periods. The basis for this 2014 report is from data reported by school districts that have reached project reporting milestones in 2013 and 2014, as well as the status of all projects to date.

There are a total of 219 school projects subject to high-performance building requirements and reporting. Of the 219 projects, 133 are in various phases of design, construction, and post occupancy annual reporting (Table 2). A complete list of all 219 school projects from August 2006 to May 31, 2014, with the project status, is included as Appendix A.

Table 2: Projects Status Summary as of May 31, 2014

Projects Status	Number of Projects
D-3 Application & Approval	14
D-5 Preliminary Funding & Design	16
D-9 Contracts & Construction	55
D-11 Completion, Board Acceptance - Annual Reporting	62
All Reporting Complete	8
Exempt	3
Not Practicable Exemption	61
Total Projects	219

Implementation

Simple reporting tools were developed for districts to use during planning, design, construction, and post-occupancy. These tools were developed by a technical advisory group made up of design professionals, OSPI School Facilities and Organization staff, and most importantly, school district personnel. All of the members had a vested interest in the requirements. The tools are used through-out the project life cycle to report high-performance strategies, achievements, and costs.

High-Performance Building Standards in Use in Washington State Schools

High-performance or green building standards require an integrated design process to create projects that are environmentally responsible and resource-efficient throughout a building's life-cycle. The common objective is to design facilities to reduce the overall impact on human health and the natural environment.

State legislation gives Washington schools a choice between the nationally recognized green building standard called Leadership in Energy and Environmental Design (LEED) or the Washington State K–12 school-specific standard called Washington Sustainable Schools Protocol (WSSP). LEED was developed in 2000 by the U.S. Green Building Council. WSSP was developed in 2006. It is based on the principles of the Collaborative of High-Performance Schools (CHPS). Washington is one of 13 states that have developed a K–12, state-specific standard. By using the self-certifying WSSP, the school districts do not have the additional project cost of independent third-party certification.

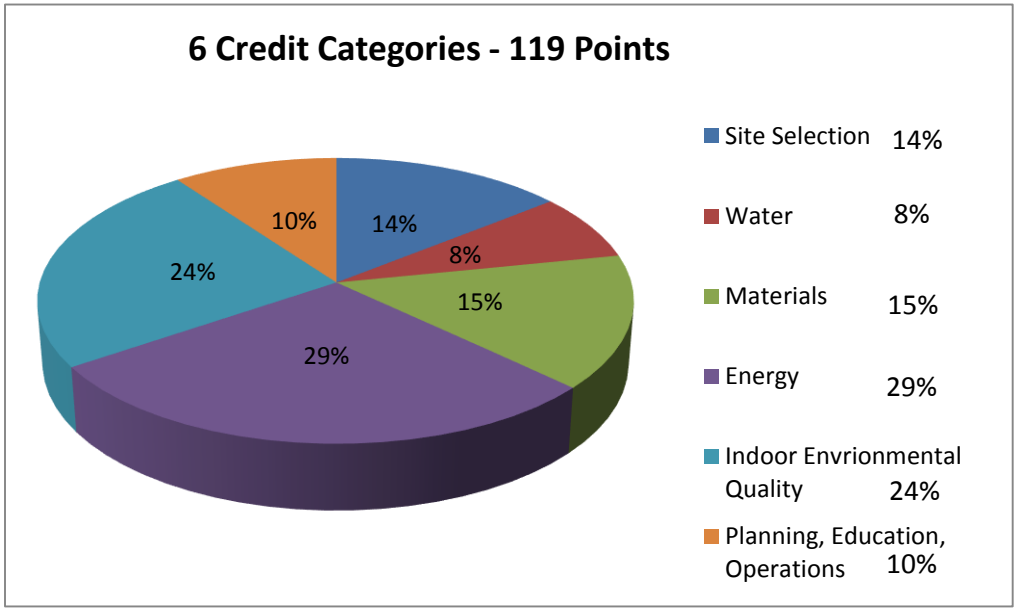
Both high-performance building standards provide designers, owners, and operators with a framework for identifying and implementing practical and measureable green building design, construction, operations, and maintenance solutions. Both target site, water, energy, indoor environmental quality, materials, and planning and operations. LEED for Schools (first introduced in 2007) and WSSP both recognize the unique nature of design and construction of K–12 schools by addressing issues such as acoustics and mold prevention, two key children’s health related issues.

LEED for Schools, designed by a committee-based, diverse group of industry stakeholders, is applied to schools across the nation. LEED is a point-based scorecard (or checklist) of green building measures that are either required or optional. LEED has four levels of compliance rating that can be achieved. The rating is based on the number of points earned. Certification that a school has met a certain level of compliance requires an independent, third-party certification at project completion. Certification confirms the school was designed and built using strategies aimed at achieving high-performance in key areas of human and environmental health, including sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

The WSSP was developed through a stakeholder process to create a set of green building standards that define a sustainable school for the state of Washington. First published in 2006, a result of a three-year pilot program, the WSSP also includes a point-based scorecard (or checklist) of green

building measures. There is a minimum point level that school projects need to achieve for compliance. The scorecard (Figure 1) is organized into six categories.

Figure 1: WSSP 2010 Points by Credit Category



The WSSP is a self-certifying design standard. It is a pass-fail rating system with required and optional credits. A stakeholder committee of school district staff and design professionals wrote the first major update to the standard in 2010. A second update is currently underway, driven primarily by the 2012 Washington State energy code changes.

Only one district reported using the LEED standard for a project. The rest of the districts have reported using the WSSP as their preferred standard to meet the high-performance requirements. For a comparison of the LEED and WSSP measures, called credits in both standards, visit the OSPI High-Performance School Buildings Program website.

Compliance and Reporting

OSPI's tracking of high-performance compliance begins with the school district's Project Application and continues through the fifth year of performance reporting. Two reporting workbooks were developed for districts to plan and report their high-performance efforts. The WSSP Workplan workbook (used during project initiation, design, and construction) includes the credit scorecard, strategies for compliance, and incremental cost analysis. Schools track and report using either the 2006 or 2010 version of WSSP depending on the project approval date. Once the project is complete, districts use the WSSP Annual Reporting workbook to report energy and water use, as well as building performance observations. The annual report is due to OSPI in March, for five years, following board acceptance or project occupancy. For a copy of the WSSP 2006/2010 Workplan and the Annual Reporting workbook, visit the OSPI High-Performance School Buildings Program website. Schools that comply with LEED are required to provide the same reporting in a similar format.

High-performance school building reporting requirements are imbedded in the School Construction Assistance Program (SCAP) development process. The primary documents that form the basis of the SCAP development process are "D-form" documents. These documents, when properly completed and signed, form official notices of agreement and intent on behalf of the district and OSPI. Essentially, D-form documents are used to request and record required submittals and tasks that need to occur in a sequential order throughout the project life-cycle (Table 3).

Districts have a specific set of high-performance documentation that must be submitted in order to be in compliance. The submittals consist of the following documents:

Intent to Comply: Districts indicate on the D-3 Project Application which high-performance standard the project will follow, or requests an exemption by including a letter describing the justification for an exemption.

Scorecard: The WSSP and LEED scorecards are commonly referred to as the checklist. The scorecard lists all credits and points attributed to each credit that are either required to be met or optional. It is completed prior to the design phase of the project and used as a green-building design guideline as the project progresses. The scorecard (included in the WSSP Workplan workbook) is required to be submitted with the D-5, D-9, and at project completion or D-11.

Cost Analysis: The cost analysis captures the incremental cost to design and construct a facility to meet a credit requirement. The incremental cost is the difference between the baseline cost and the actual cost to meet a high-performance requirement. The baseline cost is either the cost to meet building code, the cost of a standard district practice, or an alternate method of construction. The cost analysis (included in the WSSP Workplan workbook) is completed at D-9 and at project completion or D-11.

Energy Life Cycle Cost Analysis (ELCCA) Executive Summary: The executive summary of the ELCCA explains the different building designs studied and goes into depth about reasons for choosing a particular design over another. The ELCCA includes estimated annual energy consumption of the various designs through the use of standardized modeling software. In turn, it is used to estimate the percentage of energy-use reduction above code-compliance when determining points earned in the Energy category of the high-performance project scorecard. The ELCCA Executive Summary is due at D-9.

Strategies Summary: The sustainable strategies summary tells the project story of why and how the district chose particular credits to earn and the design strategies implemented to meet the credit requirements. The Strategy Summary is due at D-9.

Certification of Compliance: The certification of compliance is a form letter addressed to the OSPI School Facilities and Organization Disbursement Officer, certifying the district has complied with all high-performance school requirements throughout the project life cycle and their commitment to provide five years of annual performance reporting. The certification letter is submitted with the D-11.

Energy and Water Use, Performance Observations: Annually, in March, for five years following school board acceptance or building occupancy, districts are required to report the building annual energy and water use, as well as performance observations about measures specifically included in the project. Districts use the WSSP Annual Reporting workbook. Modeled after the Energy Star Portfolio Manager, the workbook captures general building characteristics and monthly energy and water use. Districts can use the Energy and Water Use workbook to monitor their building's utilities use, identify spikes and take corrective action, request rate changes based on use, or estimate utility operating costs for future budgets.

The performance observations are meant to be reported by facility maintenance and custodial staff or others familiar with the building performance. Observations about new material performance and new building systems performances are helpful lessons learned and can influence subsequent high-performance choices.

Table 3: School Facilities Development Process

	Design-Bid-Build Projects					
D-Form Application	**Planning Project Application**	**Predesign Analysis**	**Preparing for Construction**	**Construction**	**Occupancy**	
D-3 Project Application	Intent to Comply					**High-Performance School Requirements**
D-5 Preliminary Funding		Scorecard				
D-9 Authorization to Sign Contracts			Scorecard Cost Analysis ELCCA Strategies			
D-11 Completion Retainage Release				Scorecard Cost Analysis Certification		
Annual Reporting 5 years					Energy Use Water Use Performance	

Results

OSPI consolidates all school district submittals (through the D-form process) and reports on high-performance credits earned, project costs of compliance, and annual performance observations. Results in this report are based on data reported by districts that reached reporting milestones during 2013 and 2014.

All Projects Met Minimum Point Requirements

All 42 projects reaching occupancy or board acceptance during this report period earned the required credits and the minimum number of points. Twenty-nine projects were self-certified using WSSP 2006. Twelve projects were self-certified using WSSP 2010. Westview Elementary in Spokane submitted project documentation for 54 points to the USGBC for LEED Silver certification.

Figure 2: WSSP 2006 Projects Met Minimum Required Points

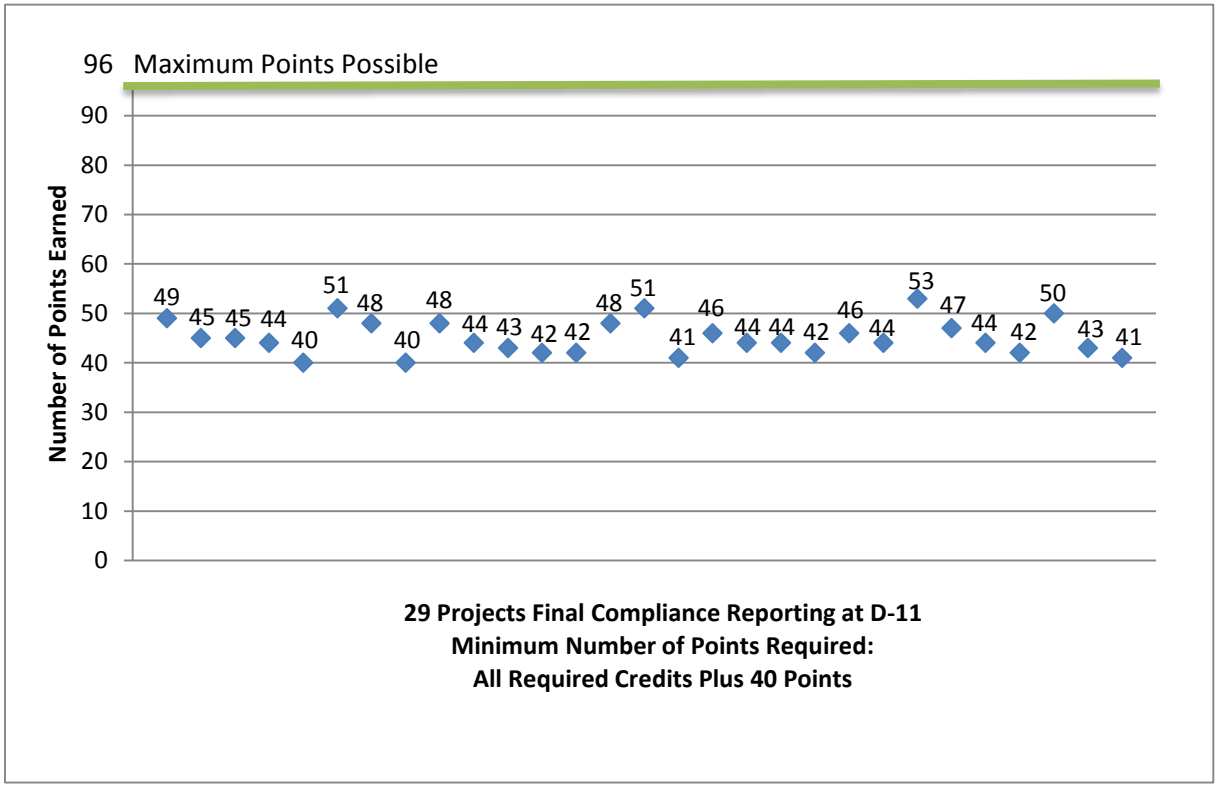
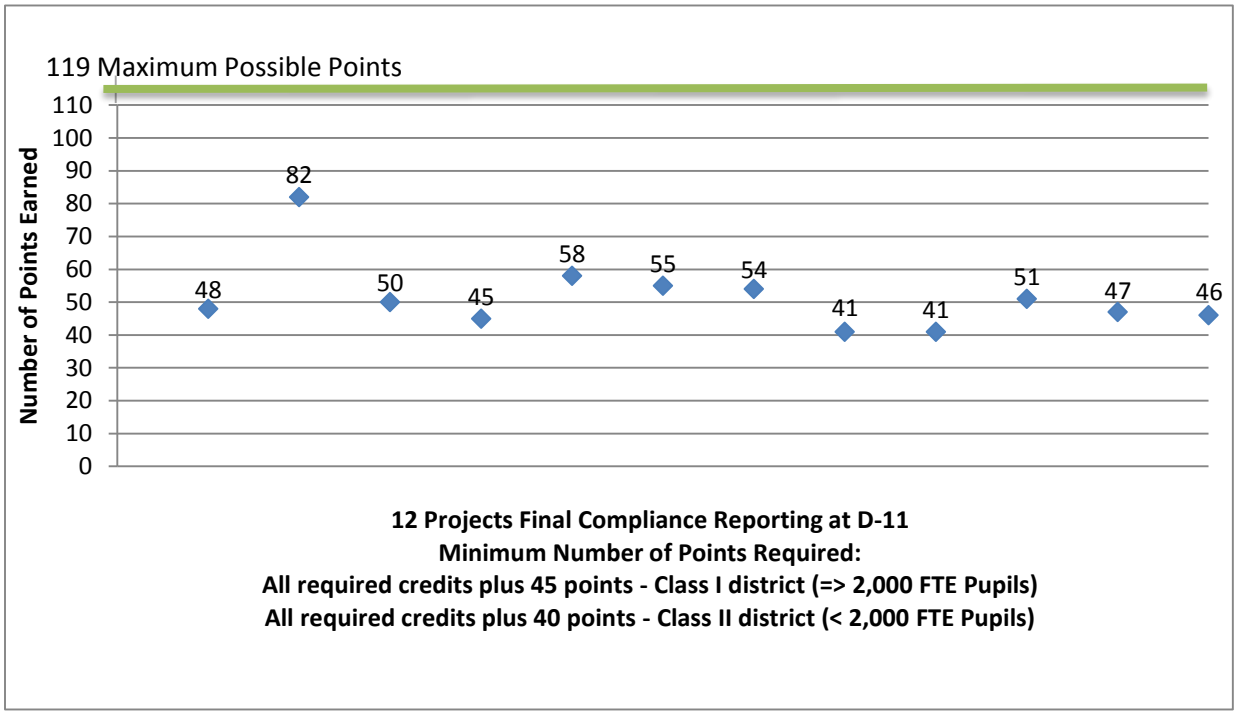


Figure 3: WSSP 2010 Projects Met Minimum Required Points



Cost of Compliance

Making capital cost comparisons between multiple projects is difficult. Every project has a different program, different design standards, project-specific constraints, varying local construction costs, different site requirements, different designers and contractors, and have targeted different high-performance priorities.

Comparison of the incremental costs for the 41 projects that used WSSP is shown in Figures 4–7. The incremental cost is the difference between a district's baseline cost and the cost to meet the high-performance credit. A district baseline is either the cost to meet code, the cost to meet the district standard, or the cost of an alternate method of doing the work. The figures show a mix of elementary, middle, high school, and skills center type projects. The incremental costs on WSSP 2006 projects range from a deferred, or avoided, cost of $196,000 to a premium, or additional, cost just over $2,334,000. The average incremental cost is $254,301, after excluding the four outliers. The middle school reporting the premium cost of just over $2,334,000 reported 64% of that cost toward indoor environmental quality credits. The incremental cost range for WSSP 2010 projects is a deferred cost of nearly $2,368,000 to a premium cost of $1,763,000. The average premium cost is $423,429 excluding the one with a very high deferred cost. The $2,368,000 deferred cost represents the cost difference between building a new two-story building and reuse of the existing building shell.

Costs per square foot, for 2006 and 2010, are a high of $26 dollars additional, to a low of $39 dollars deferred.

Figure 4: WSSP 2006 Project Incremental Construction Cost

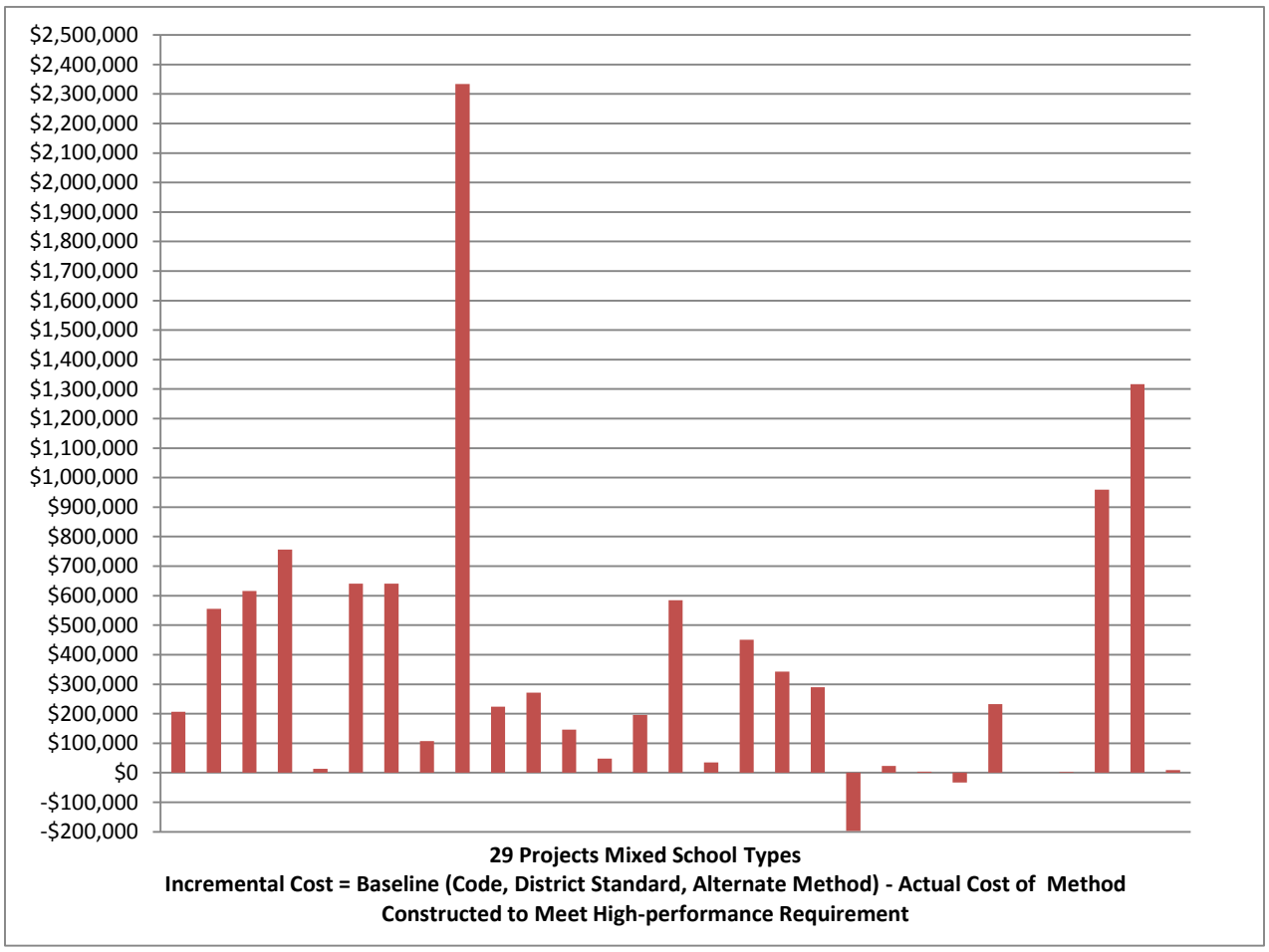


Figure 5: WSSP 2006 Project Incremental Construction Cost per Square Foot

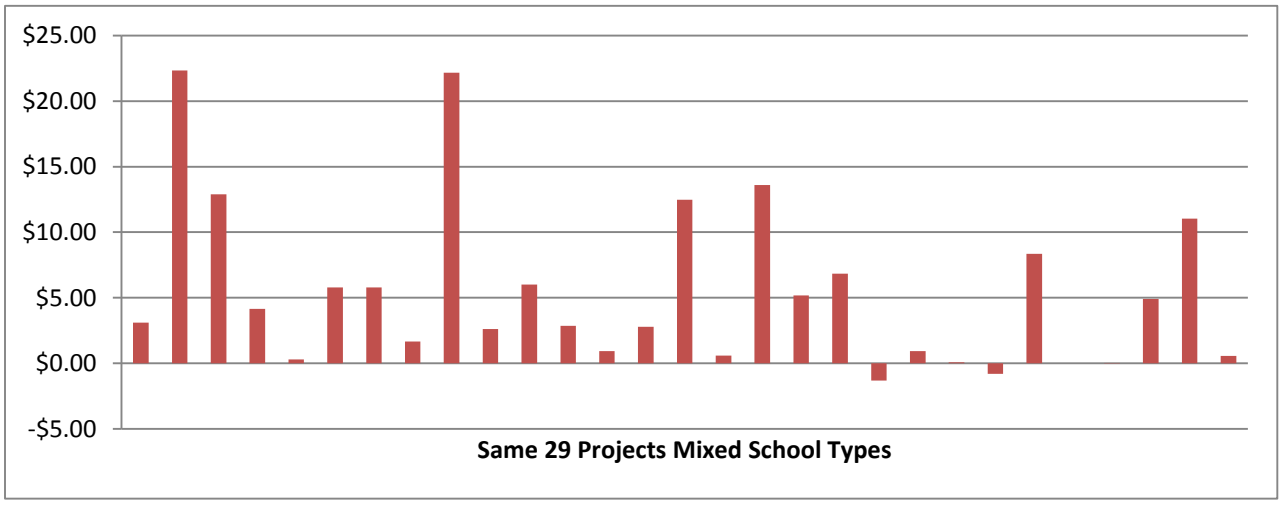


Figure 6: WSSP 2010 Project Incremental Construction Cost

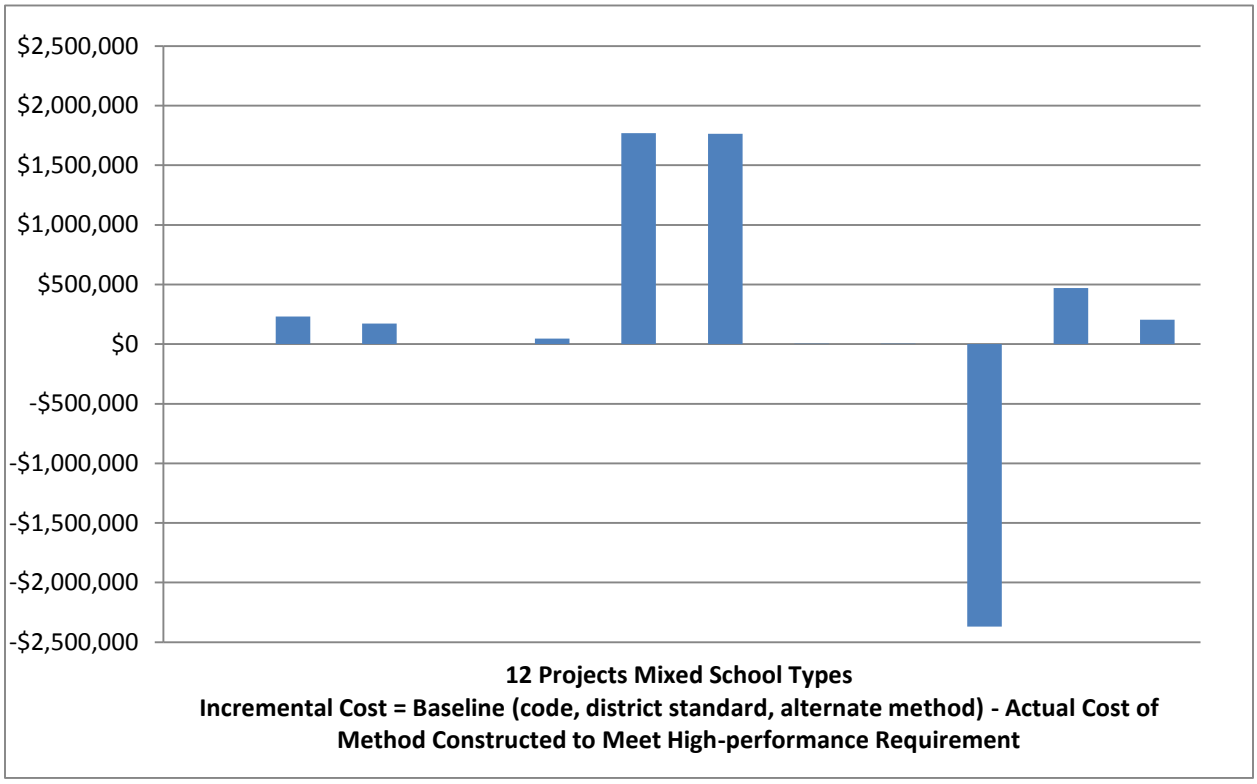
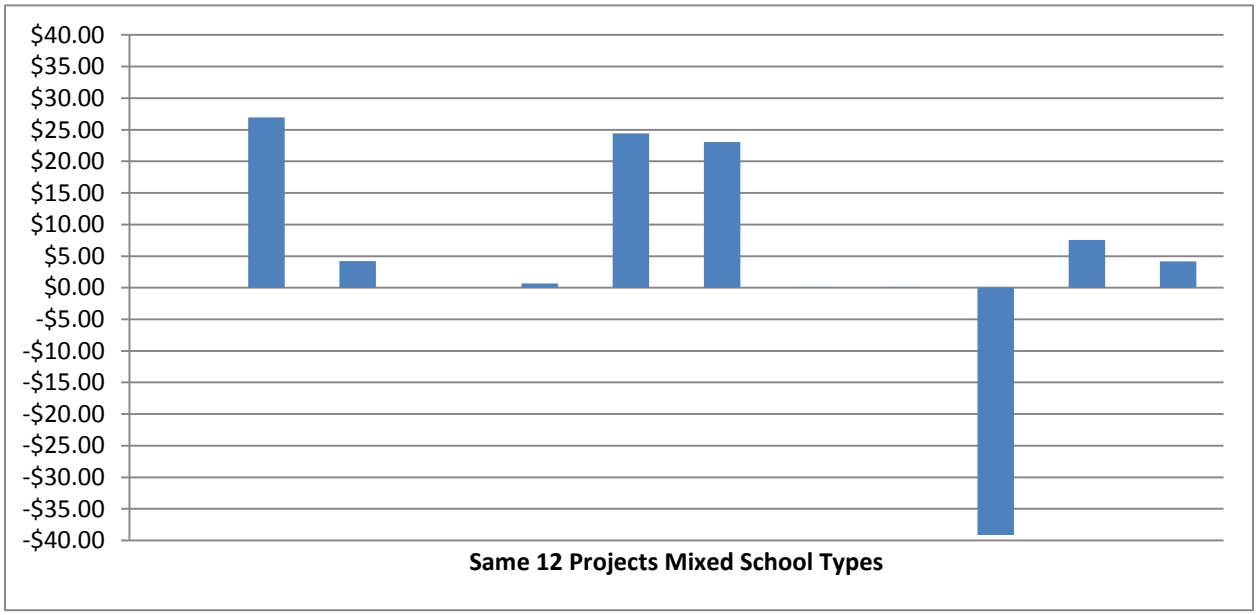


Figure 7: WSSP 2010 Project Incremental Construction Cost per Square Foot



Energy Efficiency

Schools, like other Washington state-funded buildings over 25,000 square feet, are required to complete an Energy Life Cycle Cost Analysis (ELCCA), following the guidelines and using the services of the Department of Enterprise Services (DES) Energy Program. The engineering comparisons made in the ELCCA modeling are relative comparisons of different energy-using systems in the same envelope. The purpose of the modeling is to provide information so the owner can make informed decisions about the first cost, life-cycle cost, and annual costs of operations. Forty-eight schools currently in the construction phase have conducted an ELCCA during design. The chosen designs' site Energy Use Intensity (EUI), by like building type (elementary, middle, and high school), are shown in Figures 8–10. The site EUI is calculated by taking the total energy consumed in one year and dividing it by the total square footage of the building. Forty-four of the 48 schools shown, or 92%, have a design EUI lower than the national median.[1] The national median does not discriminate between school types (levels). Therefore, it appears high in comparison to the elementary school designs. They typically have a lower EUI than a high school. Elementary schools shown in Figure 8 have the lowest design EUI. More than half are 50% below the national median.

A low site EUI is generally an indicator of an energy efficient design. However, even like-type buildings have varied EUI's due to a variety of statistically significant design and operating characteristics. Those include building location, operating hours, occupancy loads, and energy-using equipment such as refrigeration, cooking, and computers. An example of variations due to program and schedule is Columbia Basin Technical Skills Center, shown in Figure 10. Columbia Basin has specialized equipment to meet the schools technical program requirements, daylight to dark utilization, and summer school offerings to expand opportunities for students. A high-performance case study on Columbia Basin Skills Center is included as Appendix E.

School designs appear to be reaching high energy efficiency marks. This may be attributable to the Washington State Energy Code, the analysis requirements in the Energy Life Cycle Cost Analysis (ELCCA) Guidelines for Public Agencies in Washington State, the increased options for alternate and renewable energy systems, or simply the goals of the district to build an energy efficient school.

[1] Environmental Protection Agency. (July 2013). U.S. Energy Use Intensity by Property Type. *Energy Star Portfolio Manager Technical Reference.* Retrieved from https://portfoliomanager.energystar.gov/pdf/reference/US%20National%20Median%20Table.pdf

Figure 8: Elementary School EUI at Design

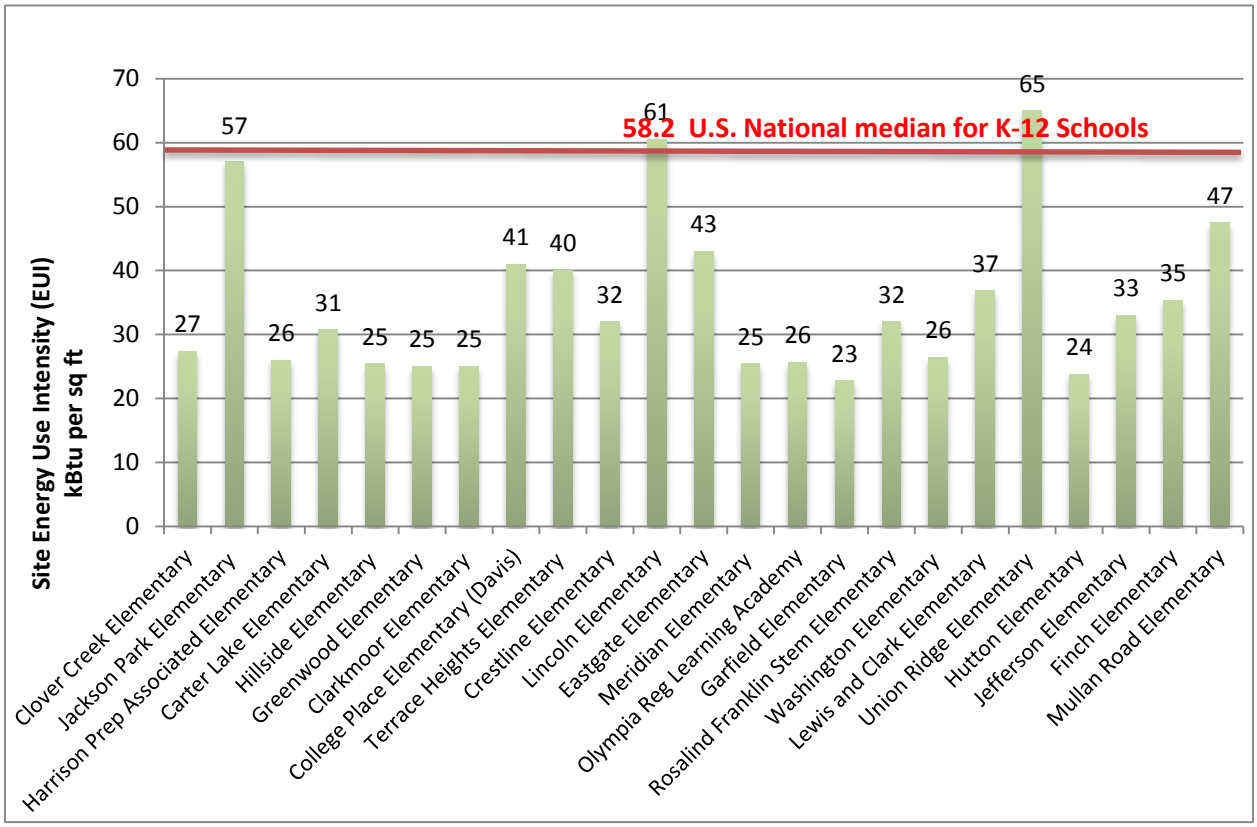


Figure 9: Middle School EUI at Design

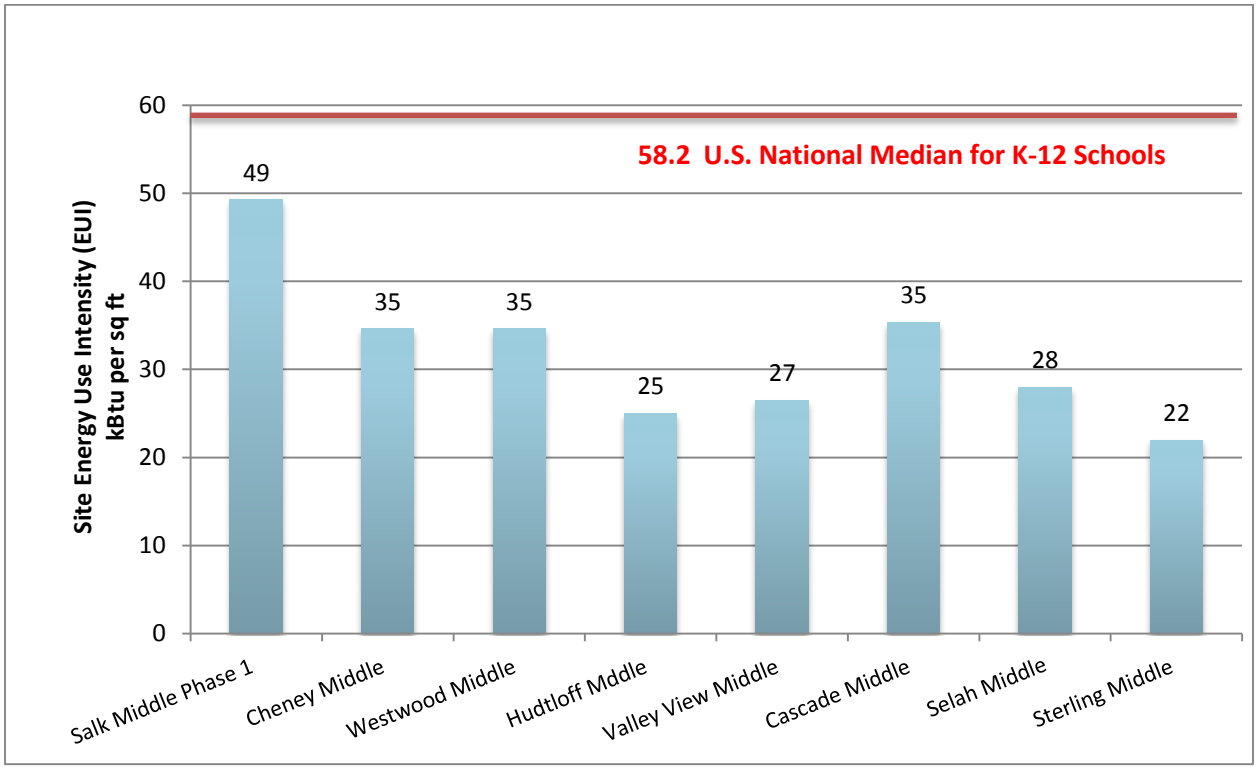
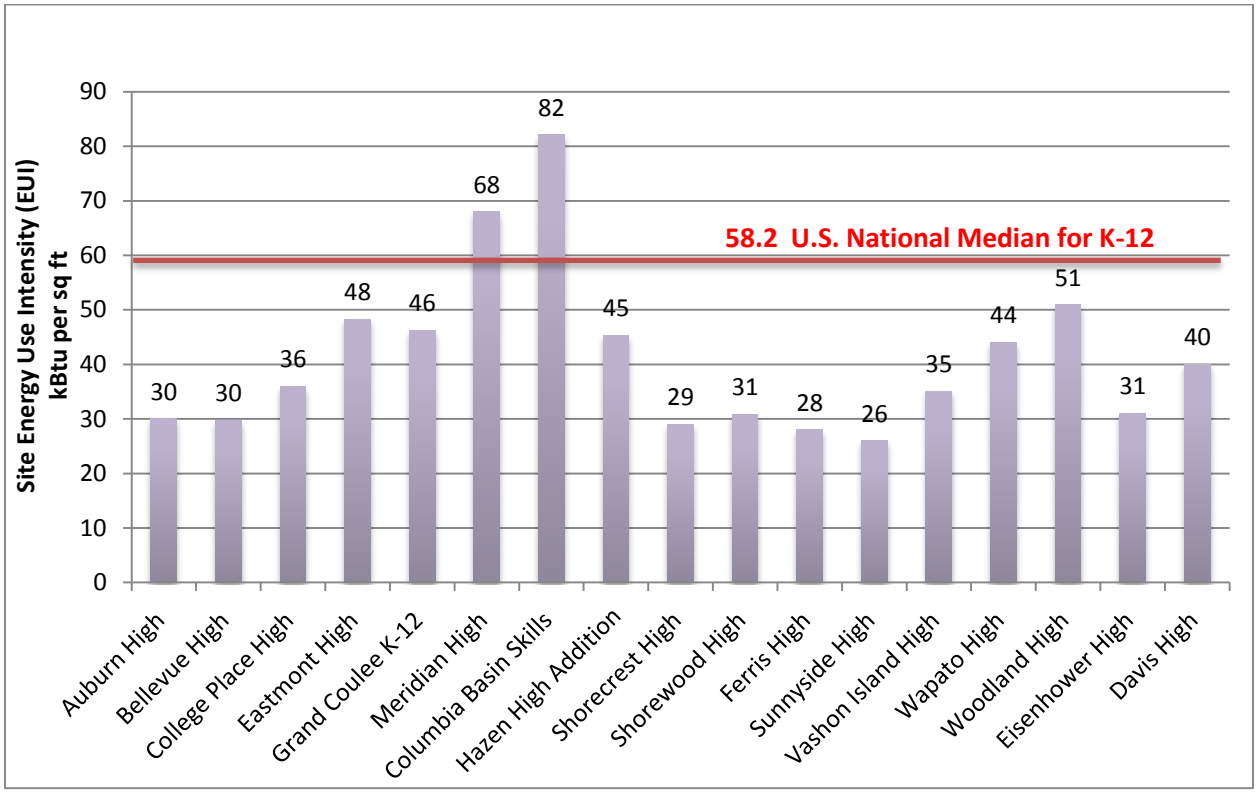
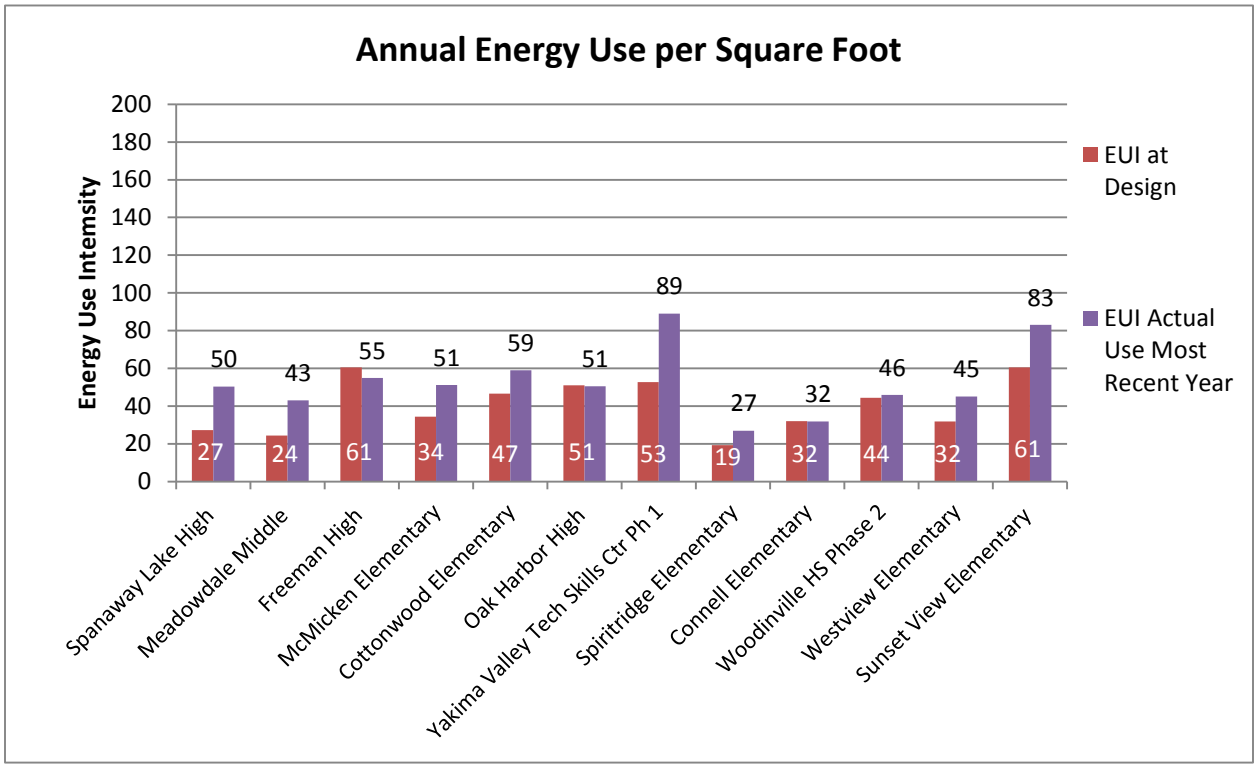


Figure 10: High School EUI at Design



Annual tracking of energy allows districts to use routinely reported data to monitor and compare outcomes of the energy efficiency measures in a new or modernized facility. Actual energy use may be higher than the modeled energy use. That does not necessarily mean a building is not energy efficient or is not meeting the district energy efficiency target. Buildings may use more or less energy than modeled at design for many reasons, including modifications to the building design after the ELCCA, energy management practices, as well as variations in climate, building activities and schedules. Figure 11 shows the actual annual energy use in EUI compared to the design EUI for 12 projects completed during this reporting period. The actual energy use is reported by the district on their annual reports. These figures are for the first or second year of operation. That period is often referred to as the "burn-in" period when operations and maintenance staff learn to operate the building and make minor system adjustments. It would not be surprising to see the subsequent years energy use decrease. In a number of instances, the energy use reported is for a different number of square feet than studied at design. The primary reason for the difference is the building energy metering. It is not uncommon that one meter serves the high-performance building, or modernized portion of the building, and also meters other buildings or spaces on a school campus. The square foot differences have been noted below the figure. Other variations, from design to actual that can make differences in energy use have not been examined.

Figure 11: Design EUI Compared to Actual EUI



Spanaway Lake High School: The square footage studied in the ELCCA is 43,324 square feet greater than the square feet reported in the annual report.

Meadowdale Middle School: The square footage studied in the ELCCA is 97,300. The meter readings in the annual report are for 102,595 square feet.

Freeman High School: The square footage studied in the ELCCA is 80,500. The meter readings in the annual report are for 85,059 square feet.

McMicken Elementary: The square footage studied in the ELCCA is 66,830. The meter readings in the annual report are for 72,711 square feet.

Cottonwood Elementary: The meter readings in the annual report include 1,000 square feet of portable space added in 2011.

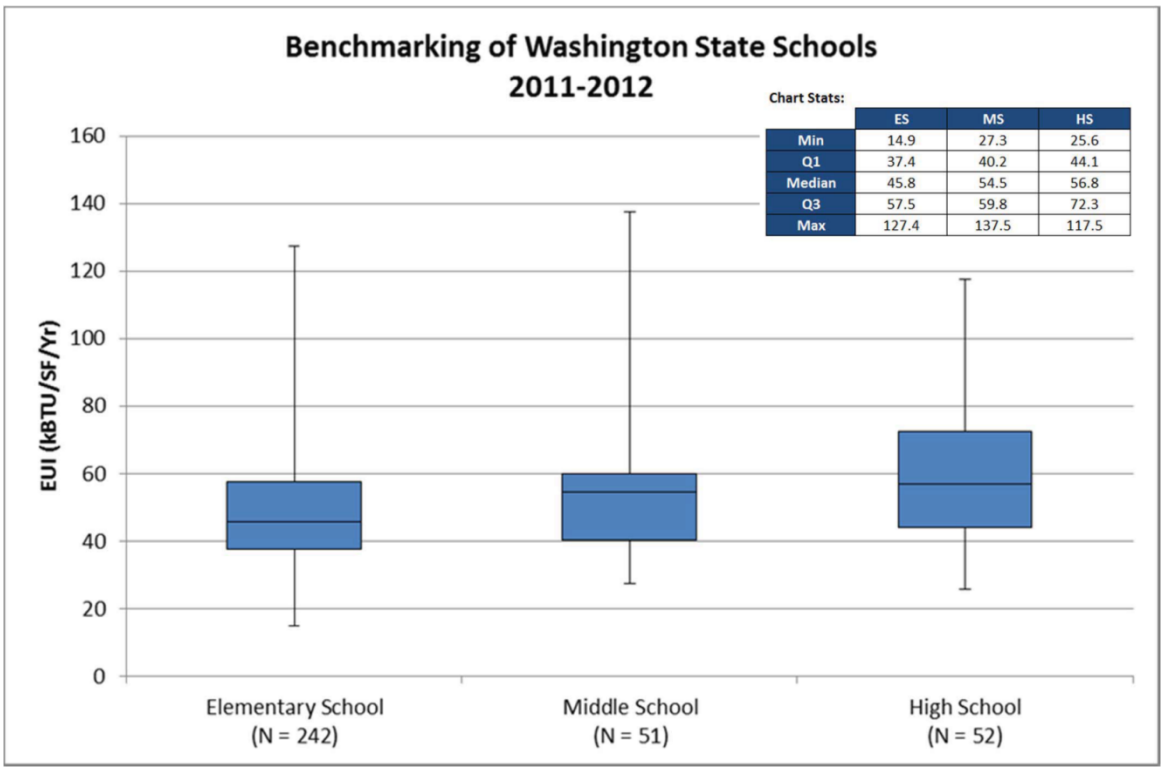
Oak Harbor High School: The square footage studied in the ELCCA is 249,500. The meter readings in the annual report are for 280,611 square feet.

Woodinville High School Phase 2: The square footage studied in the ELCCA is 130,142. The meter readings in the annual report are for 237,929 square feet.

Actual Energy Use, shown in Figure 12, is 2011–2012 data compiled from 345 Western Washington K–12 schools. These schools represent a mix of building construction type, age, programs, and

operating schedules. They were not necessarily built to meet the state high-performance building requirements. When comparing these schools with the high-performance schools, it appears the new high-performance high schools are operating below the 2011–2012 high school median and the high-performance elementary schools are operating within the same ranges.

Figure 12: Actual Energy Use Western Washington Schools[2]



Investments in energy efficiency measures provide good long term value. Net reductions of 10% to 50% below code are feasible, as shown in Table 4 below. There does not appear to be a common cost-per-point or cost-per-percentage reduction across the sample projects. The two elementary schools in the same district, designed to be 50% more efficient than code baseline, are the exception. Incremental costs for superior energy performance may include higher efficiency equipment, renewable systems, sophisticated energy management controls, building envelope features, and the latest technology in lighting and daylight measures.

[2] Hargis Engineers, 2014, James D. MacConnell Symposium Series, Regional Energy Discussion, CEFPI, *Energy Efficiency at Schools in Western Washington*

Table 4: Incremental Cost to Earn Superior Energy Performance Points in 12 Sample WSSP Projects

School Type	Superior Energy Performance Credit Points Earned 2006 Max 12 2009 Max 20	% Below 2006 WA Energy Code	% Below 2009 WA Energy Code	Incremental Cost
Skills Center	4		10-13%	$0
High Science	10		27-29%	$27,200
Elementary	8		21-23%	$46,000
Elementary	6		17-18%	$0
High	6		17-18%	$26,000
Elementary 1	12	50%		$994,048
Elementary	12	50%		$927,113
Vocational/Agriculture	4		10-13%	$0
Cafeteria	4		10-13%	$0
Elementary & High	8	30%		$226,450
Skills Center	4		10-13%	$0
Alternative High	6		17-18%	$72,000

Districts consider several factors when choosing building systems to make a building more energy efficient. Those factors include the first cost, operating cost, replacement cost, and environmental impact. As an example, Elementary 1 above has an 80 year simple payback of the incremental cost (incremental capital cost/annual energy and maintenance savings). The life-cycle cost analysis shows a projected savings of $739,000 over the 30-year life cycle of the building. The district chose a renewable energy source for the mechanical system; a ground-source heat pump plant. The ground-source system uses the earth to transfer heat to and from the building. Using the earth as the renewable energy source produces little to no waste products, such as carbon dioxide, so has a minimal impact on the environment.

Performance Observations - Operations and Maintenance

School districts report operations and maintenance observations on the annual reports for 5 years. Annual reports are prepared by people in different positions at different districts which make for a range of comments from none at all, to the ease of cleaning, to the cost to replace. The reports capture experiential performance of the building systems and materials used in the project. Positive and negative observations are expected to be reported and often include related repairs, added or avoided maintenance, performance, and custodial issues. Some of the things learned are things not to do again.

Industry-wide, many buildings that perform below design expectation can trace that performance back to building operations and operators, which can also be correlated to training. Often building operators (and even staff) are not clear on their role in operating and caring for their new building. The building systems may not be the district standard and the building products may need different care and maintenance.

The demand for, and availability of, green building products and systems continues to expand. Some districts have incorporated new materials and systems they have less experience with regarding durability, user operations, and useful life. These new materials and systems, selected for low volatile organic compound content or the energy efficiency, need to be monitored in order to establish a true value to the project over time. Districts that train their building occupants and operators, and assess and voluntarily record the performance of the new building materials, systems, and advanced technology, are creating an invaluable foundation to guide subsequent school construction projects.

Performance observations reported this year by 10 randomly selected schools are included in Appendix B.

Resource Conservation

Aside from energy, building materials and water are the next biggest opportunities for resource conservation during construction and through-out the building life cycle. Construction and building operations generate a large amount of waste. Materials selection plays a significant role in the waste during construction, the waste during building operation, and the eventual building demolition waste at the end of useful life. School projects are reducing the environmental impacts of material extraction, processing, transportation, manufacturing, use, and disposal. They are doing this by using materials with recycled contents, buying local or regionally extracted and manufactured materials, reusing existing materials and building shells, and recycling construction debris.

Water efficiency methods can easily reduce water use in the average school building design. Low-flow plumbing fixtures, sensors, and automatic controls, if installed correctly and managed, can make a significant difference. Using non-potable water for irrigation, eliminating irrigation, and planting drought tolerant plants are ways in which schools are eliminating or reducing irrigation water use.

School district high-performance building submittals to OSPI do not include the calculations done to earn credits in the water and material categories. Therefore, a data analysis cannot be made to show the amount of deferred material purchases, the construction debris diverted from the landfill, or the gallons of potable water saved. However, simply reading the credit requirements and the number of projects within the 42 projects earning the credits (Table 5) shows the commitment of school districts to conserve natural resources.

Table 5: Percent of 42 Projects to Earn Water and Material Credits

WSSP Credit	WSSP 2006	WSSP 2010	LEED 2009
Potable Water Use Reduction by 20 or 30%	90%	67%	100% (1 project)
Irrigation Water Use Reduction by 50 or 100%	72%	67%	100%
Construction Debris Recycling by 50 or 75%	86%	83%	100%
Building Reuse	38%	42%	0%
Recycled Content Materials	76%	83%	100%
Regional/Local Materials	76%	67%	100%

Incentives and Disincentives

Incentives

1. One third of the credits included in WSSP 2010 are measures to protect or enhance the indoor learning environment of schools.

2. High-performance building standards used as a design and construction guideline provide a framework of the options for creating a sustainable school building.

3. The WSSP standard supports the commitment to implement best practices of school building maintenance and operations.

4. Building high-performance schools can build public support and may incentivize the community to endorse local bond initiatives for school construction.

5. High-performance schools can support science, technology, engineering, and math programs by providing hands-on learning tools for instruction.

6. Washington State building codes, local jurisdiction codes, and green building standards are more aligned in the areas of site protection, material recycling, energy efficiency, water conservation and indoor air quality. New codes are meeting and exceeding WSSP requirements.

7. High-performance design and construction supports local, state, and federal sustainability issues focused on climate change and the built environment.

Disincentives

1. Most WSSP and LEED schools are still showing additional design and construction costs to meet the high-performance, green building standard.

2. Annual reporting may create a hardship for districts with or without facility services departments. The transition of monitoring and reporting from capital-development staff to operating staff creates an unrecognized workload.

Recommendations

1. Change the annual reporting period in RCW 39.35D.040 (2) from a minimum of five years following board acceptance of construction completion, to a minimum of five years following, either board acceptance, or building occupancy. Due to legal and other challenges, it is increasingly common for board acceptance to occur months and even years after building occupancy.

2. Include the Alternate Approach for School Districts to comply with Chapter 39.35 RCW Energy Conservation in Design of Public Facilities in the DES Guideline for ELCCA, as newly written, or the new state LCCA Guideline. The Alternate Approach has been written by a sub-committee of the Technical Advisory Committee (TAC) to OSPI's School Facilities and Organization department. The Alternate Approach meets all requirements outlined in the RCW and adds the requirement for developing and implementing a Measurement and Verification Plan.

3. Provide capital incentive funds to supplement projects to increase energy efficiency and the use of renewable sources. The incentive funds would be administered through the School Construction Assistance Program (SCAP). Projects would be incentivized using a formula-based method of allocation.

4. Incorporate high-performance building reporting into the Inventory and Condition of Schools (ICOS) web-based system where inventory and condition details about facilities and sites operated by districts are documented and stored. ICOS benefits districts by providing functionality for inventory tracking, condition rating, record keeping, and comparative and report analysis.

Conclusion

School districts statewide are engaged in "green school" activities beyond building and operating high-performance schools. They are striving to improve the health and wellness of students and staff, to provide effective environmental and sustainability education, and to reduce environmental impacts and costs. Washington Green Schools and the U.S. Department of Education's Green Ribbon Schools are just two of the many sustainable schools programs that encourage, promote, and educate school districts on how to transform school environments.

The use of the Washington Sustainable Schools Protocol, as a design and planning tool for major school construction projects is valuable, achievable, and generally acceptable. However, many of the credits are now standard best practices and required on every project by building code. Other credits cause the district and design team to consider new options. The protocol will continue to evolve as sustainable practices and technology evolves to keep up with building code requirements.

Districts with completed projects are producing annual reports of energy use, water use, and performance observations. These annual reports are valuable lessons-learned tools for the districts to evaluate the impacts of the high-performance features. Equally important is the opportunity to use these lessons-learned to make informed decisions about subsequent capital projects. No reporting or analysis methodology has been developed by OSPI to correlate Washington student achievement, staff and student attendance, or health and wellness benefits to schools built to high-performance standards. However, the links between classroom design, the indoor environment and student learning have been published, and will continue to be studied by experts worldwide. Three sources are listed in the reference section.

Costs of compliance with high-performance requirements are also reported by districts and captured by OSPI. The project-to-project and district-to-district cost differences do not enable OSPI to draw any conclusions on the "typical" incremental cost of high-performance schools. Individual project analysis is necessary to draw definitive conclusions about the financial return on the initial cost of compliance. That analysis can only be beneficial after the building has been in operation for at least two years and when the analysis includes consideration of the hard-to-quantify costs of student and staff absenteeism, health and wellness, and student achievement. High-performance or not, new schools must meet the needs of our students.

Figure 13: Spanaway Lake High School Library

Acknowledgments

This report is made possible by the many school district staff and their professional service providers who incorporated high-performance measures into their major capital projects and reported their accomplishments to OSPI. Acknowledgment is also due the WSSP Committee members, many of whom were instrumental in developing the first version of the protocol. The committee members are Carter Bagg, Nancy Bernard, Greg Brown, Tom Carver, Vernon Enns, Jim Hansen, Nancy Johns, John Mannix, Forrest Miller, Gary Miller, Ed Peters, and Bruce Pitts.

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Appendices

Appendix A: All School Projects Subject to High-Performance Building Requirements August 2006 Through May 31, 2014

New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
Oct-12	Auburn	Auburn High School Mod	Yes	Construction	Not Due Yet	
	Bainbridge	Bainbridge High School Bldg 200	Volunteer - Grant	Occupancy 2009	Year 1 - 5	Complete
	Bellevue	Ardmore Elementary Replacement	Yes	Occupancy 2010	Year 1 - 3	
	Bellevue	Bellevue HS Repl (N/L) & Mod	Yes	Construction	Not Due Yet	
	Bellevue	Eastgate El Repl (N/L)	Yes	Occupancy 2009	Year 1 - 4	
	Bellevue	Sherwood Forest El	Volunteer - Grant	Occupancy 2008	Year 1 - 5	Complete
	Bellevue	Spiritridge El Repl (N/L)	Yes	Occupancy 2011	Year 1 and 2	
	Bellingham	Shuksan Middle	Yes	Occupancy 2009	None	Year 1 - 3
	Bellingham	Wade King El	Volunteer - Grant	Occupancy 2008	Year 1	Year 2 - 5
Nov-12	Bellingham	Birchwood Elementary	Not Practicable	N/A	N/A	N/A
	Bethel	Clover Creek El Repl (N/L)	Yes	Construction	Not Due Yet	
	Bethel	Liberty Jr.	Volunteer - Grant	Occupancy 2009	Year 1 - 3	Year 4
	Bethel	Pierce Co Skills Center Phase 1	Yes	Occupancy 2010	None	Year 1
	Bethel	Pierce Co Skills Center Phase 2a and 2b one project	Yes	Occupancy 2010	None	Year 1

Annual reports are due for five years following board acceptance by statute. Districts have been given the option to begin reporting after occupancy.

New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Bethel	Shining Mountain El Repl (N/L) & Mod	Yes	Occupied 2012	None	Year 1
	Bethel	Spanaway El Repl (N/L)	Yes	Occupancy 2012	None	Year 1
	Bethel	Spanaway Lake HS Addition	Yes	Occupancy 2011	Year 1 - 2	Year 3
	Bickleton	Bickleton K-8 Ad Repl (N/L) Mod	Yes	Occupancy 2011	Not Due Yet	
Oct-12	Blaine	Blaine High School Science Bldg	Yes	Occupancy 2013	Year 1	
	Camas	Garfield Bldg Repl (N/L) *Camas HS*	Not Practicable	N/A	N/A	N/A
	Camas	Hayes Freedom HS (N/L)	Not Practicable	N/A	N/A	N/A
Oct-12	Central Kitsap	Jackson Park Elementary	Yes	Construction	Not Due Yet	
Jul-13	Central Valley	Spokane Valley Tech	Yes	Construction	Not Due Yet	
	Centralia	Oak View El Add	Volunteer - Grant	Occupancy 2008	Year 1 - 5	Complete
	Cheney	Middle School Repl -Betz Road Site	Yes	Construction	Not Due Yet	
	Cheney	New Middle (Westwood)- Abbott Road Site	Yes	Construction	Not Due Yet	
	Clover Park	Harrison Prep & Associated Elementary School	Yes	Construction	Not Due Yet	
	Clover Park	Lakes HS Aux Gym Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Clover Park	Hudtloff Middle	Yes	Construction	Not Due Yet	
	Clover Park	Hillside Elementary	Yes	Construction	Not Due Yet	
	Clover Park	Carter Lake	Yes	Construction	Not Due Yet	
Dec-12	Clover Park	Beachwood Elementary	Yes	Approval	Not Due Yet	
Nov-13	Clover Park	Evergreen Elementary	Yes	Approval	Not Due Yet	
	Clover Park	Greenwood	Yes	Construction	Not Due Yet	

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New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
Nov-12	Clover Park	Clarkmoor Elementary Replacement	Yes	Construction	Not Due Yet	
Oct-12	College Place	New College Place Elementary	Yes	Construction	Not Due Yet	
Oct-12	College Place	New College Place High School-Mod	Yes	Construction	Not Due Yet	
Sep-13	Colton	Colton School Add & Mod	Yes	Design	Not Due Yet	
May-13	Conway	Conway School Replacement & Mod	Yes	Construction	Not Due Yet	
	Davenport	Davenport K-8 Add (Repl (N/L) & Mod	Yes	Occupancy 2012	None	Year 1
	Deer Park	Deer Park HS Add/Mod	Yes	Occupancy 2010	Year 1 - 3	
	Eastmont	Grant El Mod	Yes	Occupancy 2012	None	Year 1
	Eastmont	Sterling Intermediate Mod	Yes	Construction	Not Due Yet	
	Eastmont	Eastmont High Ad & Mod	Yes	Construction	Not Due Yet	
	East Valley (Yakima)	Terrace Heights Elementary	Yes	Construction	Not Due Yet	
	Eatonville	Eatonville MS Add & Mod	Not Practicable	N/A	N/A	N/A
	Eatonville	Eatonville High School added 7/12	Not Practicable	N/A	N/A	N/A
	Eatonville	Eatonville Elementary added 7/12	Not Practicable	N/A	N/A	N/A
	Eatonville	Weyerhaeuser Elementary added 7/12	Not Practicable	N/A	N/A	N/A
	Edmonds	Meadowdale MS Repl (N/L) 1 &2	Yes	Occupancy 2011	Year 1 - 2	
	Edmonds	Lynnwood HS	Volunteer-Grant	Occupancy 2009	Year 1 - 4	
Nov-13	Entiat	Entiat Elementary Modernization	Yes	Design	Not Due Yet	
	Everett	Everett HS Little Theatre Mod	Not Practicable	N/A	N/A	N/A
	Everett	Forest View El	Volunteer-Grant	Occupancy 2007	Year 1 - 5	Complete

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New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Everett	Everett HS Gym Building	Not Practicable	N/A	N/A	N/A
	Everett	James Monroe El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Everett	Jefferson El Mod & N/L	Not Practicable	N/A	N/A	N/A
	Everett	View Ridge El	Not Practicable	N/A	N/A	N/A
	Everett	Whittier El Mod & N/L	Not Practicable	N/A	N/A	N/A
Apr-13	Evergreen (Clark)	Crestline Elementary	Yes	Construction	Not Due Yet	
	Evergreen (Clark)	(HELA) Health and Bioscience Academy	Yes	Occupancy 2013	None	Year 1
Jul-13	Evergreen Host	Clark County Skills Center	Yes	Design	Not Due Yet	
Apr-14	Federal Way	Federal Way High Addition & Replacement	Yes	Approval	Not Due Yet	
	Federal Way	Lakeland El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Federal Way	Lakota MS (N/L)	Not Practicable	N/A	N/A	N/A
	Federal Way	Panther Lake El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Federal Way	Sunnycrest El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Federal Way	Valhalla El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Freeman	Freeman El Add & Mod	Yes	Occupancy 2011	Year 1	Year 2
	Freeman	Freeman HS Mod	Yes	Occupancy 2010	Year 1	Year 3
Oct-12	Grand Coulee Dam	New K-12 School-new in lieu	Yes	Construction	Not Due Yet	
Nov-13	Grapeview	Grapeview K-8 School Modernization	Yes	Approval	Not Due Yet	
	Highline	McMicken Hts El Repl (N/L)	Yes	Occupancy 2011	Year 1	Year 2

Annual reports are due for five years following board acceptance by statute. Districts have been given the option to begin reporting after occupancy.

New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Highline	Parkside Elementary	Volunteer - Not state funded	Occupancy 2010	N/A	
	Issaquah	Creekside Elem (#15)	Yes	Occupancy 2010	Year 1 - 2	Year 3
	Kennewick	Cascade Elementary	Yes	Occupancy 2013	Year 1	
	Kennewick	Cottonwood El	Yes	Occupancy 2010	Year 1 - 4	
	Kennewick	Canyon View El Add & Mod	Yes	Occupancy 2010	Year 1 - 3	
	Kennewick	Lincoln Elementary	Yes	Construction	Not Due Yet	
Sep-13	Kennewick	Eastgate Elementary N/L	Yes	Construction	Not Due Yet	
	Kennewick	Southgate El Add & Mod	Yes	Occupancy 2011	Year 1 - 2	
	Kennewick	Sunset View El Ad & Mod	Yes	Occupancy 2012	Year 1	
	Kent	Mill Creek MS Repl (N/L) & Mod	Not Practicable	N/A	N/A	N/A
	Kent	Kent Meridian HS Main Gym	Not Practicable	N/A	N/A	N/A
	Lake Washington	Finn Hill Jr Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Lake Washington	John Muir El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Lake Washington	Helen Keller El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Lake Washington	Carl Sandburg El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Lake Washington	Lake WA HS Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Lake Washington	International Community School and Community Elementary	Not Practicable	N/A	N/A	N/A
	Lake Washington	Alexander Graham Bell El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Lake Washington	Benjamin Rush El Repl (N/L)	Not Practicable	N/A	N/A	N/A

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New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Lake Washington	Rose Hill Jr High Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Lake Washington	Rachel Carson El	Volunteer - Grant	Occupancy 2008	Year 1 - 5	Complete
Jan-14	La Conner	La Conner Middle Replacement	Yes	Design	Not Due Yet	
	Marysville	Grove El	Volunteer - Grant	Occupancy 2008	Year 1 - 4	Year 5
	Marysville	Transportation Coop Facility	Not Practicable	N/A	N/A	N/A
May-14	Mercer Island	Islander Middle Add & Replacement	Yes	Approval	Not Due Yet	
	Meridian	Meridian Elementary	Yes	Construction	Not Due Yet	
	Meridian	Meridian HS Ad, Repl (N/L) & Mod	Yes	Construction	Not Due Yet	
	Montesano	Beacon Ave El Mod	Not Practicable	N/A	N/A	N/A
Nov-13	Moses Lake	New Moses Lake High Pool Building	Not Practicable	N/A	N/A	N/A
	Moses Lake	Sage Point Elementary	Yes	Occupancy 2009	None	Year 1 - 4
	Moses Lake	Chief Moses MS Gym Ad	Not Practicable	N/A	N/A	N/A
	Moses Lake	Park Orchard El *Paxton Site*	Yes	Occupancy 2011	None	Year 1
	Moses Lake	Central Washington Transportation Cooperative	Not Practicable	N/A	N/A	N/A
Sep-12	Moses Lake host	Columbia Basin Skills Center	Yes	Construction	Not Due Yet	
	Mount Vernon	Mount Vernon HS Gym Mod	Yes	Occupancy 2013	Not Due Yet	
	Mount Vernon was LaConnor	Northwest Career & Tech Academy (NCTA) **Mt Vernon**	Yes	Occupancy 2012	None	Year 1
	Mount Vernon was LaConnor	Northwest Career & Tech Academy (NCTA) **Anacortes**	Yes	Occupancy 2010	Year 1	Year 2
	Mukilteo (host)	Sno-Isle Technical Skills Center	Not Practicable	N/A	N/A	N/A

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New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	North Franklin	Connell El Repl (N/L)	Yes	Occupancy 2011	Year 1 - 2	Year 3
	North Franklin	Olds Jr Mod & Add	Yes	Occupancy 2013	Year 1	Year 2
Sep-13	North Mason	New High School	Yes	Design	Not Due Yet	
	North Thurston	Chinook MS Add & Mod	Not Practicable	N/A	N/A	N/A
	North Thurston	Nisqually MS Add & Mod	Not Practicable	N/A	N/A	N/A
	Northshore	Bothel HS Phase 3 Mod & Add	Volunteer - Grant	Occupancy 2008	Year 1 - 5	Complete
	Northshore	Kenmore Jr High Repl (N/L) - Phase 3	Yes	Occupancy 2012	Year 1	
	Northshore	Woodinville HS Repl (N/L) Phase1&2	Yes	Occupancy 2012	Year 1	
May-14	Northshore	Woodinville HS Repl (N/L) Phase 3	Yes	Approval	Not Due Yet	
May-14	Northshore	New High School #4	Yes	Approval	Not Due Yet	
	Oak Harbor	Oak Harbor HS Repl (N/L)/Mod	Yes	Occupancy 2010	Not Due Yet	
Sep-13	Ocosta	Elementary Round Bldg Play shed replacement N/L	Yes	Approval	Not Due Yet	
Jan-13	Olympia	Garfield Elementary	Yes	Construction	Not Due Yet	
Jan-13	Olympia	Olympia Regional Learning Academy (ORLA)	Yes	Construction	Not Due Yet	
Nov-13	Orcas Island	Orcas Island Middle/High Replacement and Modernization	Yes	Design	Not Due Yet	
	Orient	Orient El Ad & Mod	Yes	Occupancy 2012	Year 1	
Feb-14	Othello	Transportation Coop Facility	Exempt building type	N/A	N/A	N/A
	Othello	High Classroom Add	Not Practicable	N/A	N/A	N/A
	Othello	Lutacaga El Ad /Mod	Not Practicable	N/A	N/A	N/A
	Othello	McFarland Jr High Ad/Mod	Not Practicable	N/A	N/A	N/A

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New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Othello	Othello HS Ad/Mod	Not Practicable	N/A	N/A	N/A
	Othello	Hiawatha El Ad & Mod	Not Practicable	N/A	N/A	N/A
	Othello	Scootney El Ad & Mod	Not Practicable	N/A	N/A	N/A
	Othello	New Wahitis El	Not Practicable	N/A	N/A	N/A
Nov-13	Pasco	New Elementary #14	Yes	Design	Not Due Yet	
Nov-13	Pasco	New Elementary #15	Yes	Design	Not Due Yet	
Dec-12	Pasco	New Elementary #13	Yes	Construction	Not Due Yet	
May-13	Pasco	New Delta High School	Yes	Design	Not Due Yet	
	Pomeroy	Pomeroy Jr/Sr High	Yes	Occupancy 2012	Year 1	
Nov-13	Pullman	Pullman High Replacement and Modernization	Yes	Approval	Not Due Yet	
	Quillayute Val	Forks HS Add & Repl (N/L)	Yes	Occupancy 2012	Year 1 - 2	
Mar-14	Renton	New Middle #4 (Hillcrest Center Replacement)	yes	Approval	Not Due Yet	
	Renton	Hazen HS Add (N/L)	Yes	Construction	Not Due Yet	
Nov-13	Richland	Marcus Whitman Elementary Addition & Replacement	Yes	Approval	Not Due Yet	
Nov-13	Richland	Lewis and Clark Elementary Add & Replacement	Yes	Construction	Not Due Yet	
Nov-13	Richland	Sacajawea Elementary Addition & Replacement	Yes	Design	Not Due Yet	
Nov-13	Richland	New South Richland Elementary #10	Yes	Design	Not Due Yet	
Oct-12	Ridgefield	Union Ridgefield Elementary	Yes	Construction	Not Due Yet	
Oct-12	Ridgefield	South Ridge Elementary	Yes	Construction	Not Due Yet	
	Riverview	Carnation El Mod	Not Practicable	N/A	N/A	N/A

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New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Riverview	Cherry Valley El Repl (N/L) & Mod	Not Practicable	N/A	N/A	N/A
	Riverview	Riverview Alternative	Not Practicable	N/A	N/A	N/A
Nov-13	Royal	Intermediate School Addition	Yes	Approval	Not Due Yet	
May-14	Seattle	World School at TT Minor Elementary	Yes	Approval	Not Due Yet	
	Seattle	Denny MS /Chief Sealth HS)	Yes	Occupancy 2010 & 2011	None	Year 1
	Seattle	Hamilton Int MS	Volunteer - Grant	Occupancy 2010	Year 1	Year 2 and 3
	Seattle	Ingraham H Repl (N/L)	Not Practicable	N/A	N/A	N/A
Jan-14	Seattle	Cedar Park Elementary	Yes	Design	Not Due Yet	
	Seattle	Nathan Hale HS (N/L) and Mod–Phase 1 & Phase II	Yes	Occupancy 2011 Phase 1	None	Year 1
Apr-13	Seattle	Horace Mann Elementary Modernization	Not Practicable Historic	N/A	N/A	
Nov-13	Seattle	Genesee Hill Elementary replacement	Yes	Design	Not Due Yet	
	Sedro-Woolley	Cascade Middle School Modernization and Addition	Yes	Construction	Not Due Yet	
Oct-12	Selah	Selah Middle School new in lieu	Yes	Construction	Not Due Yet	
Oct-12	Selah	Selah High School Additions	Yes	Construction	Not Due Yet	
	Shoreline	Shorecrest HS Repl (N/L) & Mod	Yes	Construction	Not Due Yet	
	Shoreline	Shorewood HS Repl (N/L)	Yes	Construction	Not Due Yet	

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New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Snohomish	High School - Phase 1 sets 1,2,3 and Phase 2 set 4. Mod/New/Non-Matchable	Volunteer - Grant	Occupancy 2011	Set 2 Year 1 - 4, Set 3 Year 1 - 2	Year 5 set 2, Year 3 set 3, Year 1 set 4
	Snohomish	Machias El Repl N/L	Yes	Occupancy 2011	Year 1	Year 2
	Snohomish	Riverview El Repl (N/L)	Yes	Occupancy 2011	Year 1	Year 2
	Snohomish	Valley View MS Repl (N/L)	Yes	Construction	Not Due Yet	
	Spokane	Shadle Park HS Mod	Volunteer - Grant	Occupancy 2010	Year 1 - 3	
Dec-13	Spokane	New Tech Skills Center	Yes	Design	Not Due Yet	
Nov-13	Spokane	Salk Middle School	Yes	Construction	Not Due Yet	
	Spokane	Westview El Repl (N/L)	Yes	Occupancy 2012	Year 1	
	Spokane	Ferris High Repl (N/L) & Mod	Yes	Construction	Not Due Yet	
	Spokane	Jefferson Elementary	Yes	Construction	Not Due Yet	
Dec-12	Spokane	Finch Elementary	Yes	Construction	Not Due Yet	
Nov-13	Spokane	Hutton Elementary replacement & Modernization	Yes	Construction	Not Due Yet	
	Spokane	Mullan Road Elementary Replacement and Modernization	Yes	Construction	Not Due Yet	
	Steilacoom	Pioneer MS	Volunteer - Grant	Occupancy 2008	Year 1 - 5	Complete
	Sumner	Bonney Lake El Repl (N/L) & Mod	Not Practicable	N/A	N/A	N/A
	Sumner	Victor Falls El	Not Practicable	N/A	N/A	N/A
	Sumner	Lakeridge MS N/L	Not Practicable	N/A	N/A	N/A
	Sumner	Maple Lawn El	Not Practicable	N/A	N/A	N/A
	Sumner	Sumner MS Repl (N/L) & Mod	Not Practicable	N/A	N/A	N/A

Annual reports are due for five years following board acceptance by statute. Districts have been given the option to begin reporting after occupancy.

New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Sunnyside	Sunnyside HS Add & Mod (N/L)	Yes	Construction	Not Due Yet	
Jan-13	Sunnyside	Sunnyside High Addition	Yes	Construction	Not Due Yet	
	Tacoma	Baker MS Repl (N/L)	Yes	Occupancy 2011	None	Year 1
	Tacoma	First Creek Middle	Not Practicable	N/A	N/A	N/A
	Tacoma	Gray Middle	Volunteer - Grant	Occupancy 2009	Year 1 and 2	Year 3 - 5
	Tacoma	Geiger El Repl (N/L)	Not Practicable	N/A	N/A	N/A
	Tacoma	Washington Elementary Mod	Yes	Construction	Not Due Yet	
Nov-13	Touchet	Touchet School Modernization	Yes	Approval	Not Due Yet	
	Tumwater	New Market Skills Lab Bldg D	Volunteer - Grant	Occupancy 2007	Year 1 - 5	Complete
	University Pl	Curtis HS Gym Replacement	Not Practicable	N/A	N/A	N/A
	University Pl	Curtis HS Aquatic Ctr Repl (N/L) & Mod	Not Practicable	N/A	N/A	N/A
	Valley	Valley K-8 School Add	Yes	Occupancy 2010	Year 1 - 3	
	Vancouver	Vancouver Arts & Acad Mod	Volunteer - Grant	Occupancy 2008	Year 1 - 2	Year 3
	Vashon	Vashon Island High School N/L	Yes	Construction	Not Due Yet	
	Walla Walla	South East Area Technical (SEA Tech) Skills Center	Yes	Design	Not Due Yet	
	Wapato	Wapato HS Addition & Mod	Yes	Construction	Not Due Yet	
	Warden	Warden MS/HS Gym Mod	Yes	Occupancy 2012	None	Year 1 and 2

Annual reports are due for five years following board acceptance by statute. Districts have been given the option to begin reporting after occupancy.

New This Reporting Period	School District	School Name & Project Type	High Performance Designation	Project Status Approval - Occupancy	Annual Reports Received	Reporting Status
	Warden	Warden Vo-Ag Bldg Mod and Addition	Yes	Construction	Not Due Yet	
	Warden	Cafeteria Ad & Mod	Yes	Occupancy 2012	None	Year 1 and 2
	Wellpinit	Wellpinit El and High Mod	Yes	Occupancy 2013	None	Year 1
Oct-13	Wenatchee	Wenatchee Valley Tech Renovation	Yes	Design	Not Due Yet	
	West Valley	9th Grade Center Modernization	Exempt <50%	N/A	N/A	N/A
	White Pass	White Pass El Ad (N/L) & /Mod	Not Practicable	N/A	N/A	N/A
	White Pass	White Pass Jr/Sr	Not Practicable	N/A	N/A	N/A
	Willapa Valley	Willapa Valley HS & MS	Volunteer - Grant	Occupancy 2009	Year 1 - 3	Year 4
	Willapa Valley	Elementary Remodel and Modernization	Exempt <50%	N/A	N/A	
Jan-13	Woodland	New Woodland High School	Yes	Construction	Not Due Yet	
	Yakima	A.C. Davis High School Mod & Rev	Yes	Construction	Not Due Yet	
Dec-12	Yakima	Yakima Valley Tech Skills Center Phase 3 - Sunnyside branch	Yes	Construction	Not Due Yet	
	Yakima	Yakima Valley Tech Skills Center Phase 2	Yes	Occupancy 2014	Not Due Yet	
	Yakima	Yakima Valley Tech Skills Center Phase 1	Yes	Occupancy 2010	Year 1 - 2	Year 3
	Yakima	Stanton Alternative High Ad & Repl (N/L)		Occupancy 2012	None	Year 1
	Yakima	Eisenhower HS Add & Repl (N/L)	Yes	Construction	Not Due Yet	

Annual reports are due for five years following board acceptance by statute. Districts have been given the option to begin reporting after occupancy.

Appendix B: Performance Observations – Operations and Maintenance

Credit Category	School District			Bellevue	Bethel	Edmonds	Freeman	Highline
	School			Spiritridge Elementary	Spanaway Lake High	Meadowdale Middle	Freeman High	McMicken Elementary
	Annual Report Period			Year 2	Year 3	Year 2	Year 2	Year 1
Site	**3) Stormwater Management**							
		S3.1	**On-site Infiltration and Flow Control**				Additional mowing and weed eating	
		S3.3	**Enhanced Stormwater Treatment**		Additional cost to weed rain gardens			
Water	**1) Outdoor Systems**							
		W1.1	**Irrigation Water Reduction (50%, 100%)**	More improvement needed-considering landscape redesign, storm water storage and reuse				
	2) Indoor Systems							
		W2.1	**Potable Water Use for Bldg Sewage Reduction (25%, 45%)**				Batteries/ controls have often replacements	
		W2.2	**Potable Water Use Reduction (20%, 30%, 40%)**				Batteries/ controls have often replacements	Students noted they were unclear about how to make green handle/low flow toilets operate
Materials	**1) Waste Reduction & Efficient Material Use**							
		M1.0	**Storage and Collection of Recyclables**	Continues to improve, more composting, still some contamination				

Credit Category	School District			Bellevue	Bethel	Edmonds	Freeman	Highline
	School			Spiritridge Elementary	Spanaway Lake High	Meadowdale Middle	Freeman High	McMicken Elementary
	Annual Report Period			Year 2	Year 3	Year 2	Year 2	Year 1
Energy	**1) Efficiency**							
		E1.1	**Superior Energy Performance**	Excellent improvements				
	2) Controls							
		E2.1	**HVAC and Operable Windows**	Good				
		E2.2	**Daylight-Responsive Controls**	Impressive				
	3) On-Site Alternative Sources							
		E3.1	**On-site Renewable Energy (5-10% bldg supply)**	Excellent				
	4) Commissioning							
		E4.1	**Enhanced Commissioning (1--3 possible)**	Considering additional commissioning				
	5) Management							
		E5.1	**Energy Management Systems**	Considering additional commissioning	Additional cost to keep EMS program. Need to simplify the code requirement for controls.			

Credit Category	School District			Bellevue	Bethel	Edmonds	Freeman	Highline
	School			Spiritridge Elementary	Spanaway Lake High	Meadowdale Middle	Freeman High	McMicken Elementary
	Annual Report Period			Year 2	Year 3	Year 2	Year 2	Year 1
Indoor Environmental Quality	**1) Daylighting**							
		IEQ1.1	**Daylighting (25%, 50%, 75%, 100%)**		Additional cost to keep lighting controls working appropriate. Need simplify code requirements for controls system		Seem to be fine now, high maintenance checks	
	2) Electric Lighting Quality							
		IEQ2.1	**Electric Lighting Quality**	Excellent				
	3) Indoor Air Quality							
		IEQ3.0	**Ventilation, Filtration, & Moisture Control Minimums**	Isolated indoor air quality concerns-did not meet rigorous district standards-issues were corrected with commissioning agent				
		IEQ3.1	**Low-Emitting Interior Finishes**				Paint not durable	
		IEQ3.3	**Source Control**	Good				
		IEQ3.4	**Ducted HVAC Returns (req'd when 246-366A is in effect**	Some issues seen-corrected				

Credit Category	School District			Bellevue	Bethel	Edmonds	Freeman	Highline
	School			Spiritridge Elementary	Spanaway Lake High	Meadowdale Middle	Freeman High	McMicken Elementary
	Annual Report Period			Year 2	Year 3	Year 2	Year 2	Year 1
Indoor Environmental Quality (Cont.)	**3) Indoor Air Quality**							
		IEQ3.5	**Particle Arrestance Filtration**	Improved sanitary conditions			Some filters need more often replacement	
	4) Acoustics							
		IEQ4.0	**Minimum Acoustic Performance**					Long hall by gym and MP room echoes
	5) Thermal Comfort							
		IEQ5.0	**Thermal Code Compliance**					Heat a recurring issue in office area and energy mgt. System parameters were adjusted several times
	6) User Controls							
		IEQ6.1	**User Control- windows**	OK now staff needs additional training				
		IEQ6.2	**User Control - temperature and lights**	Excellent comfort scheduling and energy control				

Credit Category	School District			Bellevue	Bethel	Edmonds	Freeman	Highline
	School			Spiritridge Elementary	Spanaway Lake High	Meadowdale Middle	Freeman High	McMicken Elementary
	Annual Report Period			Year 2	Year 3	Year 2	Year 2	Year 1
Planning Education Operations	**1) Planning**							
		PEO 1.2	**Durability, Efficiency & Maintainability**			Polished concrete floors and P-Lam wainscoting in halls have proven attractive, easy to maintain and highly durable. Native landscaping would have benefitted from a longer, perhaps 3-year, maintenance contract to become fully established.		
	4) Operational Activities							
		PEO 3.1	**Post Occupancy Evaluation**	Currently in process for Energy Star Certification				

Credit Category	School District			Kennewick	Kennewick	North Franklin	Oak Harbor	Spokane
	School			Sunset View Elementary	Cottonwood Elementary	Connell Elementary	Oak Harbor High	Westview Elementary
	Annual Report Period			Year 2	Year 4	Year 2	Year 2	Year 1
Site	1) Selection & Use							
		S1.4	Joint Use of On-Site Facilities	Providing the joint use of on-site facilities has definitely resulted in increased utility and custodial costs when the facilities are being used by organization for which the rental fees are waived.	Providing the joint use of on-site facilities has definitely resulted in increased utility and custodial costs when the facilities are being used by organization for which the rental fees are waived.			
	3) Stormwater Management							
		S3.1	On-site Infiltration and Flow Control	In an effort to increase on-site infiltration and improve the aesthetics of the site, planting beds and trees were incorporated in the school design. However, the addition of these areas has likely resulted in increased maintenance and water usage.	In an effort to increase on-site infiltration and improve the aesthetics of the site, planting beds and trees were incorporated in the school design. However, the addition of these areas has likely resulted in increased maintenance and water usage.			Drainage swale was staying wet, irrigation system required adjustment
	4) Outdoor Surfaces							
		S4.1	Reduce Heat Island - Site		Heat Island reduction through landscaping was incorporated in the school design. However, the addition of these areas has likely resulted in increased water usage and maintenance.	Trees expensive to maintain		

Credit Category	School District			Kennewick	Kennewick	North Franklin	Oak Harbor	Spokane
	School			Sunset View Elementary	Cottonwood Elementary	Connell Elementary	Oak Harbor High	Westview Elementary
	Annual Report Period			Year 2	Year 4	Year 2	Year 2	Year 1
Water	1) Outdoor Systems							
		W1.1	Irrigation Water Reduction (50%, 100%)				Increased costs due to addition of new playing fields.	
	2) Indoor Systems							
		W2.1	Potable Water Use for Bldg Sewage Reduction (25%, 45%)				Waterless urinals have very high maintenance costs for replacing expensive cartridges.	
		W2.2	Potable Water Use Reduction (20%, 30%, 40%)	Water savings through the use of water efficient systems are unclear. Many of the fixtures will sometime have to be flushed twice. Also, it would seem that sinks with aerators are run twice during hand washing due to the reduced pressure. Aerators have also presented problems in school kitchens; many of the kitchen staff find the resulting water pressure inadequate.	Water savings through the use of water efficient systems are unclear. Many of the fixtures will sometime have to be flushed twice. Also, it would seem that sinks with aerators are run twice during hand washing due to the reduced pressure. Aerators have also presented problems in school kitchens; many of the kitchen staff find the resulting water pressure inadequate.	Expensive to maintain fixtures		Auto-sensing plumbing fixtures required adjustment

Credit Category	School District			Kennewick	Kennewick	North Franklin	Oak Harbor	Spokane
	School			Sunset View Elementary	Cottonwood Elementary	Connell Elementary	Oak Harbor High	Westview Elementary
	Annual Report Period			Year 2	Year 4	Year 2	Year 2	Year 1
Materials	**2) Sustainable Materials Procurement**							
		M2.2	**Rapidly Renewable Materials**					Linoleum flooring seams required several warranty visits, cracking in some places
Energy	**1) Efficiency**							
		E1.1	**Superior Energy Performance**				Energy efficiency improved dramatically following modifications. EUI rating of 52 is approaching design calculation of 50.	
	2) Controls							
		E2.2	**Daylight-Responsive Controls NREC 2009 NREC 2006**				Dimmable ballasts fail more often than standard ballast and cost 9 times more, which consumes any energy savings.	
	5) Management							
		E5.1	**Energy Management Systems**				Most of EMCS glitches have been corrected and the system is fairly reliable.	Controls required several months to adjust and balance

Credit Category	School District			Kennewick	Kennewick	North Franklin	Oak Harbor	Spokane
	School			Sunset View Elementary	Cottonwood Elementary	Connell Elementary	Oak Harbor High	Westview Elementary
	Annual Report Period			Year 2	Year 4	Year 2	Year 2	Year 1
Indoor Environmental Quality	**1) Daylighting**							
		IEQ1.1	**Daylighting (25%, 50%, 75%, 100%)**					Occupancy sensors for lighting required adjustments
		IEQ1.2	**Permanent Shading**					Interior light shelves require more time to dust. Exterior sun shading makes cleaning windows more difficult
	3) Indoor Air Quality							
		IEQ3.1	**Low-Emitting Interior Finishes**				Low VOC floor glue has been a complete disaster with floor tiles coming unglued throughout the school.	
		IEQ3.3	**Source Control**				Chemistry lab ventilation issues have been improved by correcting poor construction.	
	6) User Controls							
		IEQ6.2	**User Control - temperature and lights**				Comfort control is excellent. Most of the lighting control issues have been repaired.	

Appendix C: Deer Park High School Case Study

Project Specifics

Gross square footage: 152,119
Construction cost: $36,443,000
Project occupied: September 2010
Student Capacity: 912
Designed Site EUI: 53.94 kBTU/sf/yr
Potable water use reduction rate: 33%
Construction waste diversion rate: 77%
Recycled Materials: 18%

Design and Construction Team

Project manager: Steve Howard (Deer Park Schools)
Architect: NAC|Architecture
Structural engineer: Structural Design Northwest
Civil engineer: Taylor Engineering
Mechanical engineer: Meulink Engineering
Electrical engineer: NAC Engineering
Landscape architect: Gavin Associates
Green building consultant: NAC|Architecture
General contractor: GARCO Construction

The Deer Park High School Additions and Modernization Project is the culmination of years of planning and hard work toward the improvement of our school facilities. Built in 1980, Deer Park High School had become a crowded, inefficient, and often uncomfortable building. Through community support, with the assistance of state matching funds, we were able to fully renovate the original 80,156 sf building and add 71,963 sf of new space.

Sustainability helped shape the design of new classrooms, science labs, a second gym, a performing arts theater, and common areas.

Efficient design of the HVAC, lighting, and building control systems have led to a dramatic reduction in the cost per square foot for utilities. Overall, these design innovations and sustainable product choices have created a comfortable and handsome building that more effectively meets the needs of our students and staff, while greatly improving our building operating efficiency

Site

Deer Park high school is located in Deer Park, Washington on a 40-acre site. The property is adjacent to an additional 55 acres of District owned property. It is flat, well drained, and is easily accessible. 100% of storm water runoff is accommodated on-site.

Water

Through the use of efficient plumbing fixtures, automatic faucets, flushometers, and efficient appliances, potable water consumption has been significantly reduced. Irrigation water usage has also been reduced through low flow/localized watering for plant materials in planting beds and green spaces. We have seen a 33% decrease in water use rates for this facility.

Materials

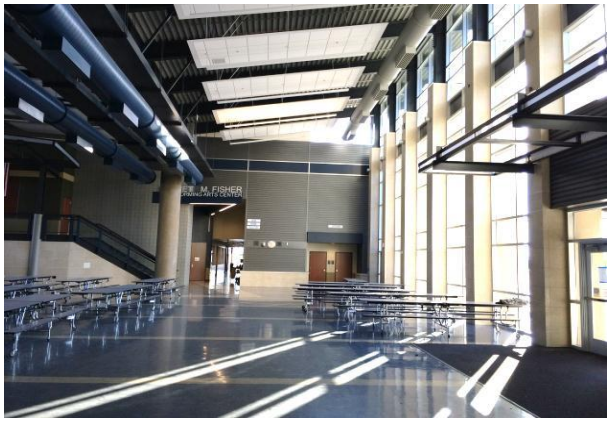
Materials for the project were selected with sustainability and longevity in mind. Approximately 51% of the original building shell was reused. This reduced the need for new materials and decreased the amount of the construction material waste generated by our project. New materials were composed of 18% recycled content and construction waste materials were reduced by 77% through recycling. Approximately 32% of new materials used in our project were manufactured within 500 miles of the school. This helped reduce transportation related costs, fuel consumption, and pollution.

Energy

Lighting - efficient fluorescent lighting and increased natural lighting were used throughout the building.

Heating and Cooling

A central outside air system with heating/cooling recovery allows for improved building ventilation and increased operating efficiency. Insulation and air infiltration barriers have improved the efficiency of the building envelope.



Indoor Environmental Quality

Low-emitting materials: Sealants and adhesives, paint, carpet, and other finishes meet required standards for low-emitting materials, reducing off gassing and odors.

Ventilation - CO2 sensors used throughout the building allow us to provide appropriate amounts of outside fresh air while improving the operating efficiency of the building. Operable windows in classrooms and offices allow for natural ventilation.

Planning, Education, Operations

Deer Park High School reflects careful planning, thoughtful design, and quality craftsmanship. It provides support for High School academic and extra-curricular programs, district activities, and community events unlike any other facility in our area.

Sustainable design and construction have created a facility that is functional, efficient, comfortable, and aesthetically pleasing. It is a source of pride for our students, our staff, and our community.

Appendix D: Riverview Elementary Case Study

The new Riverview Elementary School in Snohomish School District is a replacement facility. Riverview Elementary serves Grades 1 through 6. The school is located in a semi-rural/ suburban portion of Snohomish. The project included the demolition and removal of the existing building.

The project was fast tracked through 3 separate bid packages to start construction before completion of the design, including a separate structural steel package. The bid packaging also prepped the site for wet weather construction.

The site includes a significant wetlands area incorporated into the site landscape. Site development included sustainable practices to reduce surface water runoff through the use of pervious concrete hardscapes and rain gardens for parking areas.

The building layout is configured around classroom clusters or pods on two stories. Each cluster contains a small group learning area.

Project Specifics

Gross square footage: 76,536 GSF
Construction cost: $21,625,400
Project occupied: January 2011
Student Capacity: 600 Students
Designed Site EUI: 18 EUI
Innovation: 100kw Photovoltaic Array, Super Insulated Structure, Ground Source Heat system,

Design and Construction Team

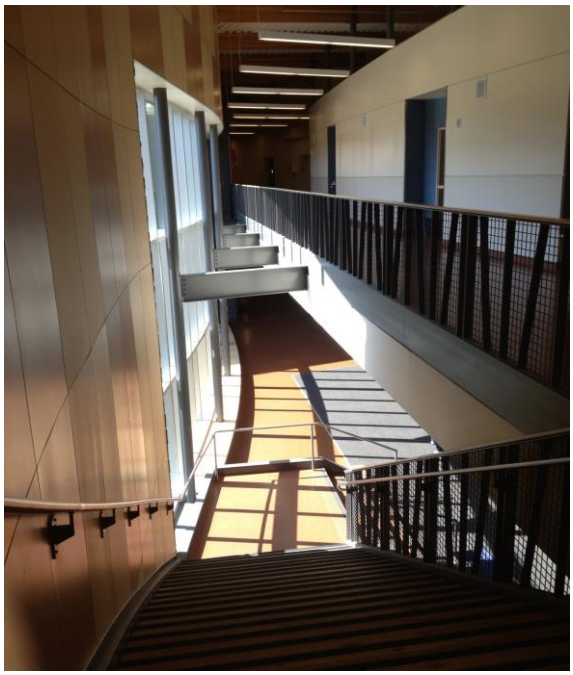
Owners representative: Heery International
Project manager: Steve Moore
Architect: NAC | Architecture
Structural engineer: Coughlin Porter Lundeen
Civil engineer: Coughlin Porter Lundeen
Mechanical engineer: Hargis Engineers
Electrical engineer: Hargis Engineers
Landscape architect: Weisman Design Group
General contractor: Babbit Neuman Construction

Site

Pervious concrete hardscapes to reduce storm detention. Rain Gardens located at parking areas to reduce storm detention. Wetlands area preserved with paths and observation areas to incorporate into school curricula. Use of green roof also provides patio area for staff breaks.

Materials

Concrete masonry unit exterior with prefinished panels. Bathroom partitions are made of recycled milk bottles.



Energy

Approximately 17% of the energy needed is generated by renewables. Ground Source Loop Heat Pump system. Triple pane windows throughout. 100kw photovoltaic array provides power to the PUD and provides power credits to the district. Building envelope insulation is well above code. LED exterior lighting. Daylight harvesting in many areas. Comprehensive building energy management system. Sun shading for exterior windows.

Roofing

The district chose an Energy Star-labeled cool roofing system for 75% of the roof surface. The remainder of the roof area is covered with vegetated roofing.

Indoor Environmental Quality

Displacement ventilation throughout to provide superior indoor air quality. All classrooms have multiple operable windows. Classrooms have individual room temperature and lighting controls. Low-emitting materials: sealants and adhesives, paint, carpet, and other finishes meet required standards for low-emitting materials, reducing off gassing and odors. Direct line of sight vision glazing is visible from over 90% of critical task areas.

Education and Operations

The project includes student learning opportunities through signage describing green building strategies and windows exposing building systems to view. An interpretive nature trail extends through the enhanced wetland buffer, with species identification signage at native plants. A timeline of the site's geological history will be installed along the porous concrete pathway around the playfields, chronicling ancient periods of local glaciation.

Appendix E: Columbia Basin Technical Skills Center Case Study

Moses Lake School District is the host district to Columbia Basin Technical Skills Center. The center serves students from 11 school districts with programs in advanced manufacturing, global health, culinary skills, computer science, entrepreneurship, pre-engineering, multi-craft pre apprenticeship and medical careers. Programs run all year round, including summer exploratory programs for incoming 9th graders thru 12th graders.

Sustainability is a high priority for this project. All project stakeholders were invited to attend an eco-charette held in the early design phase.

The design takes advantage of as much technology as possible, including CNC milling and water jet precision machines that serve multiple programs. Grant funding provided equipment to build composite aerospace materials.

Many of the major high-performance building features are inherent in the design of this facility. Those include the building shape, volume, and orientation to the sun.

The center is the culmination of discussions that have been going on and off since the early 1980's.

Project Specifics

Gross square footage: 43,600
Project cost: $19,400,000
Project occupied: June, 2014
Designed Site EUI: 82.0 kBtu/sf/yr
On-site Alternative Energy Source: 122 panel, 32 kW photovoltaic array
Irrigation water use reduction rate per design: 50%
Materials manufactured and extracted within 500 miles of the site: 50% per specification requirement

Design and Construction Team

District project consultant: John Aultman
Project manager: ESD 112 CSG
Architect: NAC|Architecture
Structural engineer: Structural Design Northwest
Civil engineer: Taylor Engineering
Mechanical engineer: L & S Engineering
Electrical engineer: NAC Engineering
Landscape architect: Gavin Associates
Solar array design and installation: Eco Depot, Inc.
General contractor: Fowler General Construction

Site

Over 20 years ago, the site had been previously excavated for a sunken football field. The district performed remediation approximately two years ago to prepare it for this project. The IT infrastructure is developed to facilitate shared use by remote users. Portions of this facility are available to the community. All site lighting is designed such that zero direct-beam illumination leaves the site.

Water

The project irrigation reduces the water consumption by at least 50%. Water efficient, adapted native grasses, the elimination of turf-type grasses, and providing point-source irrigation all contribute to the reduction. The potable water use reduction target at design is 30%.

Materials

The specifications require that at least 50% (by cost) of the building materials are both extracted and manufactured within a 500 mile radius of the site. The project also includes the use of certified wood products, recycled content materials, and construction site waste management.

Indoor Environmental Quality

Low-emitting materials: Sealants and adhesives, paint, carpet, and other finishes meet required standards for low-emitting materials, reducing off gassing and odors.

Energy

A 32 kW photovoltaic array is installed on the roof. A dashboard provides real-time monitoring/viewing of the energy generation. Lighting - efficient fluorescent lighting and increased natural lighting were used throughout the building. An electric vehicle charging station is provided to encourage and promote the use of zero emission vehicles. The building is designed to operate 29% more efficient than the code-minimum building.

Daylighting attributes include light wells, interior light shelves, high clerestory windows, and permanent shading to prevent glare.

Appendix F: Denny International Middle School / Chief Sealth International High School Case Study

Project Specifics

Gross Square Footage: 355,000 sf
Construction Cost: $105,000,000
Project Occupied: 9/ 2010 and 9/ 2011
Student Capacity: 900 (DIMS); 1,200 (CSIHS)
Construction Waste Diversion Rate: 2,045.0 tons/80.3%
Recycled Materials: Existing building reused
Innovation: Adaptive reuse of mid-century high school for a combined middle/high school campus that supports multiple community uses.

Design & Construction Team

Owners Representative: Don Gillmore, SPS
Construction Manager: Robert Evans, Heery International
Architect: Bassetti Architects
Structural Engineer: Coughlin Porter Lundeen
Civil engineer: Coughlin Porter Lundeen
Mechanical Engineer: Wood Harbinger
Electrical Engineer: Tres West Engineers
Landscape Architect: The Berger Partnership
General Contractor/GCCM: JV Constructors (Project 1); Absher Construction (Project 2); BNBuilders (Project 3)

The overarching design theme of Denny International Middle School / Chief Sealth International High School in Seattle School District is celebrating connections between the two schools, the community, a multitude of cultures, and the environment. The Seattle School District's primary goal was to provide a personalized learning path from 6-12th grade to decrease the high dropout rates triggered by students switching campuses between middle and high schools.

To support the District's desire for academic excellence, the middle school is designed around grade-based learning clusters. Each of the six Small Learning Communities (SLC),has its own science lab and adaptable breakout space for collaborative or individual use. By accommodating multiple curricular approaches and enhancing student connections, SLC's create personalized learning experiences.

Sustainable features include green roofs, stormwater collection and distribution to Longfellow Creek, and daylighting in all learning spaces. The new Galleria at the heart of the two schools offers flexibility as a divided space supporting separate schools, or as a shared space.

Site

- Building is centrally located with good access for over 95% of student population
- Rate and quantity of stormwater run-off at the site is decreased
- Rain gardens treat stormwater run-off
- Pervious sidewalks reduce stormwater run-off
- Light-colored concrete paving and green roofs reduce heat island effects

Water

- Native and drought-tolerant landscaping reduces irrigation needs
- Controlled irrigation & scheduled maintenance maximizes water use

Materials

- Reuse of existing high school by retaining its structure, shell, and interior
- Reuse of original wood bleachers, wood floors from the gym, and auditorium seating materials
- Certified wood used for new construction
- Ozone-depleting materials such as HCFCs and halon eliminated
- Regional and local materials reduce transportation impacts to the environment
- Accessible waste separation and recycling areas are located throughout the two schools

Indoor Environmental Quality

- Effective daylighting contribute with exterior/interior shading to eliminate direct sunlight
- Natural ventilation, moisture control, and air filters provide good indoor air quality throughout
- Ceiling fans and operable windows in classrooms provide comfort
- Ducted HVAC returns prevent dust and microbial growth

Planning, Education, Operations

- Outdoor learning area, greenhouse, and wetland lab spaces allow students to participate in the environmental enhancement of adjacent Longfellow Creek
- Rainwater collected on the Galleria and green roof is filtered through open runnels and rain gardens before discharging to Longfellow Creek
- Audio enhancement systems in classrooms support teaching and student learning

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