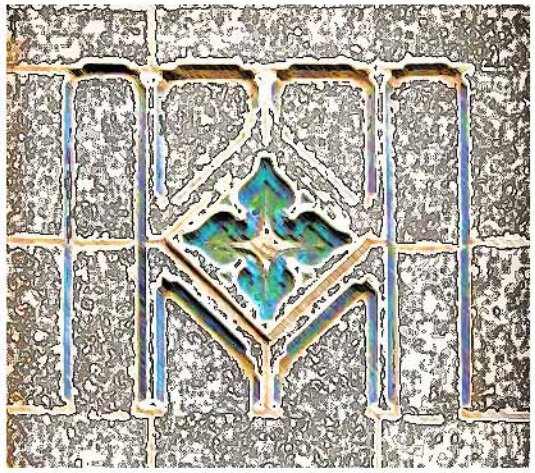
THE

CASEY MIDDLE SCHOOL
ENVIRONMENTAL INSTRUCTION MANUAL

A GUIDE TO GETTING THE MOST OUT OF YOUR SCHOOL



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SUSTAINABILITY

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DESIGN IMAGES

Your school is a unique and fun place – to learn, to play, and to work. The design team wanted to take time to explain the building, because we think the “why?” and the “how?” of Casey Middle School are really important for you, the user, to understand.


CASEY "BEFORE"

Casey Middle School

The original Casey Middle School was built in 1924, in the collegiate gothic style, as one of the first Junior High (Middle) Schools in the country to create a unique environment for the 6th, 7th, and 8th grades. Prior to this, there were no Junior High Schools. Additions were constructed in 1956, 1970, and 1990, but by 2006 time had taken its toll on the school and methods for educating kids had changed. After extensive studies on the existing building layout, unstable soils, traffic patterns, student needs and teacher needs, the school district decided to demolish the majority of the existing building. A significant effort was made to save and restore two of the exterior walls from the original 1924 school as a means of preserving the rich history and architectural elements. These elements include terra cotta wall panels, intricate brick work, wood trim and gothic style light fixtures.

Very early in the process, the City of Boulder committed to providing funding to ensure the new school was of the highest environmentally-conscience standard possible. This additional funding was critical to providing current and future Casey students with a great new school.

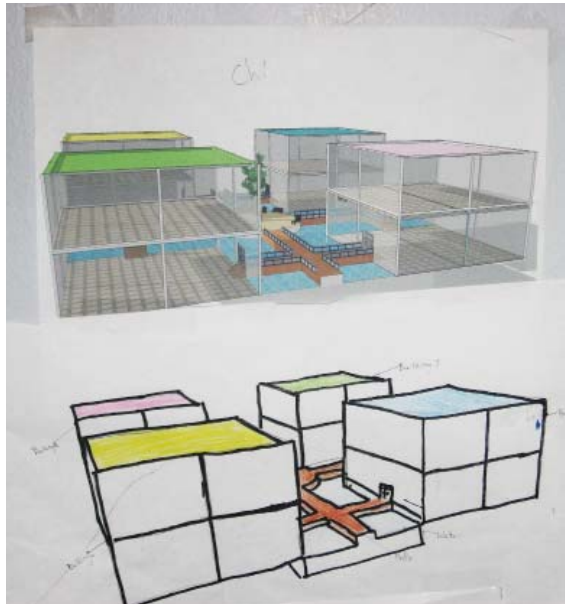
The 106,458 square foot school is sized for 600 students and includes a 361-seat auditorium. To conserve as much open space as possible on this small 8.4 acre urban site, the classroom wing of the new building is three stories high and half the staff parking is tucked under the building. Features of the new school include an array of solar panels, a planted "green" roof, and extensive natural daylighting with automatic dimming systems. The mechanical system is a ground source heat exchange system with water-to-air heat pumps for both heating and cooling.

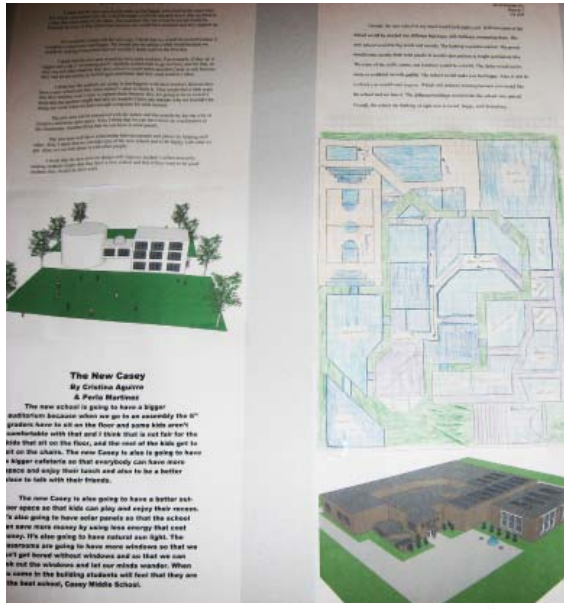
Use your school to help save the planet!

Over the last several decades, people have become more aware of how our actions affect our environment. You may have made some changes in your own life to reduce, re-use, and recycle. You may be using cloth bags at the grocery store instead of paper or plastic, riding your bike instead of taking a car, or avoiding the use of plastic bottles for water.

Did you know that there are very important things about your school that can also help protect our Earth? A large percentage of the energy used in the United States goes into our buildings: both in producing new buildings and in running existing ones. The team that designed your school added special features to make it an energy-efficient, healthful, and comfortable place that does less harm to the environment. The students and staff of the current Casey Middle School also spent a lot of time planning and identifying creative features for future Casey Cubs to enjoy.

This book will highlight some of these features so you can understand how the building works and what you can do to make the world a better place.





Some design ideas for your new school, by Casey students.

CLASSROOMS

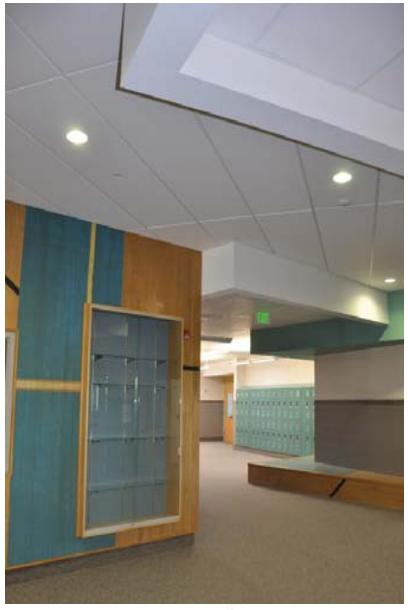
Classrooms are all about learning. They are the building blocks of the school and the location where kids and teachers will spend most of their time. Casey Middle School's classroom features include:

. North Daylight
. Daylight Control
. Lighting Control
. Classroom Acoustics

LEARN

CLASSROOMS

Classrooms are grouped in teaching team arrangements around common spaces where student lockers, study/break-out space and teacher planning areas are located. Floors are divided by grade level, with specialties like art, computers, and foreign language on the south side of the building.



LEARN

North Daylight

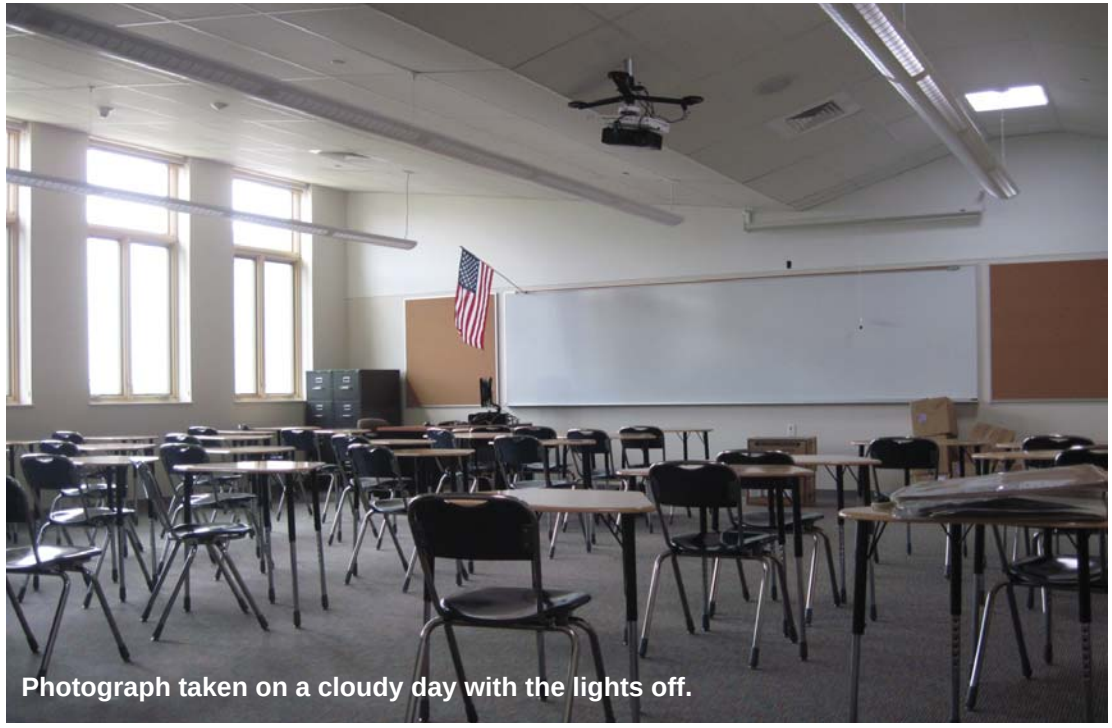
Northern light is softer and more diffuse than light from other directions. By orienting the classrooms to maximize northern light, glare and heat gain from the sun are dramatically reduced. Angled ceilings direct natural light deeper into the room.

Whenever possible, tubular skylights are used to balance the daylight in the space, further reducing the need for artificial light. Highly reflective white paint and ceiling materials are used above seven feet to help maximize the effectiveness of this natural light. Not only does artificial light consume electricity, it also emits heat. This means the mechanical systems have to work even harder to maintain a comfortable temperature in the room, which consumes more energy… and taxpayers' money.

Daylight Control

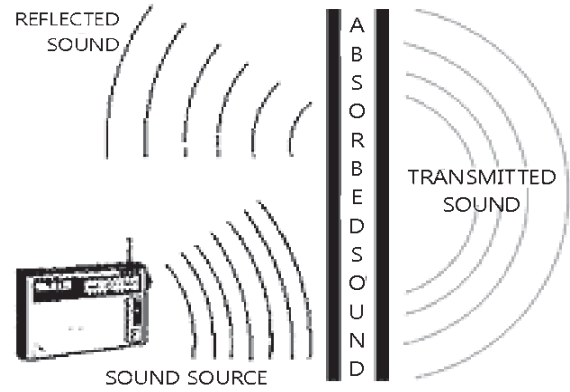
It is important for a teacher to be able to darken a room for a specific activity, like a movie. Shades on the windows and controls for the tubular skylights allow the teacher to achieve this. There is a toggle switch located near the door to control the dampers inside the tubular skylights that close off the "tubes", to help darken the room as needed. In addition, a light switch is located near the projection screen for turning off the lights adjacent to the projection screen for A/V presentations. Be sure to open the tubular skylight dampers when you need more light again!

Always keep in mind the savings you can contribute by using daylight first and electric lights second. This results in lower energy costs, less energy use, and reduced CO_2 emissions from the power company. Also, if you don't take advantage of the daylighting, the electric lights will heat up the room and the air conditioning may not be able to keep everyone cool.



Photograph taken on a cloudy day with the lights off.

Image used with permission from Solatube International.



Lighting Control Zones

The classrooms have (4) zones of lighting control, and a four button over-ride switch is located at the door for control of each zone:

- One button for zone 1 - skylight row
- One button for zone 2 - middle row
- One button for zone 3 - window row, inside lamp
- One button for zone 4 - window row, outside lamp
- Toggle switch - dims tubular skylights

In classrooms with daylighting controls, the lighting control is integrated with a photocell sensor. The photocell detects if the light level is above or below the programmed lighting level. Each zone of lighting turns "on" if the photocell detects the light level is below the programmed lighting level. If the photocell detects the light level is above the programmed lighting level, the lights for the associated zone will either be turned off, or will not be allowed to be turned on until the light level falls back below the programmed light level. If you turn on a light and it doesn't come on, it is because the room has enough natural daylight and the additional light is not needed.

The lights in each classroom need to be turned on manually when you enter the room. When you leave the room, you can either turn the lights off manually or if you neglect to do so, they will automatically turn off after a maximum time of 30 minutes. This is controlled through an occupancy sensor located in each classroom, which senses movement in the room. If there is no movement after a programmed length of time, the sensor turns the lights off.

Classroom Acoustics

The difference between sound and noise is how desirable it is. Teachers should be able to be clearly understood within the classroom without distracting background noises. The walls between classrooms were designed to meet a Sound Transmission Class (STC) of 53, meaning day to day noises should not be clearly transmitted through the wall. Noisier spaces like the music classrooms and gymnasium are in a different part of the building than academic classrooms in order to isolate noise and have even higher STC ratings.

If sound bounces around in a room too much, it causes reverberation and makes the spoken word difficult to understand. Most of the classrooms in Casey Middle School utilize a ceiling tile with a Noise Reduction Coefficient (NRC) of 0.7 out of 1, which represents the amount of energy absorbed when the energy strikes that surface.

- The art room at Casey uses a spray applied acoustic ceiling with a very high NRC.
- A mix of reflection and absorption is desirable in the music rooms to allow the sounds to mix together. Notice the convex wall shapes and pyramid-shaped ceiling tiles to help reflect sound.
- See the gym section for more acoustic information.

CAFETERIA & KITCHEN

The cafeteria in your school doubles as an entry lobby and provides space for meetings, presentations, and other activities. Multi-use spaces are a great way to conserve space and energy.

. Recycle and Reduce Waste
. Compost
. Kitchen Equipment
. Letter from BVSD Nutrition Services

EAT

Recycle and Reduce Waste

The kitchen and cafeteria are places you can make a big difference. Reducing the amount of packaging on food items also reduces the amount of waste that you throw away.

If you bring your lunch to school, use re-usable containers. Many containers like glass, aluminum and plastic are recyclable. Be sure to toss them in the recycling, not in the trash.

Here are some facts on recycling:

- Making new aluminum cans from used cans takes 95 percent less energy
- Glass containers are 100 percent recyclable, can be recycled endlessly, and recovered glass is used as the majority ingredient in new glass containers.
- Plastics in the U.S. are made primarily (70 percent) from domestic natural gas.
- Not only does recycling save energy, it also saves space in the landfill.

Compost

Most schools only have two containers, one for trash and one for recycling. Casey will have a third container, for compost! All food waste from the kitchen and un-eaten food left on your tray or from your packed lunch should be composted. There will be several collection points around the kitchen and cafeteria for you to put your compost in.

Kitchen Equipment

The kitchen equipment was selected based on one or more of the following: amount of water used, energy effiiciencies, or types of refrigerant used.

The kitchen at Casey Middle School is a unique example of water efficiency. The dish machine not only does an excellent job of cleaning soiled dishes and utensils from the kitchen, but also uses less water than comparable models. The spray rinse faucets used to pre-rinse dishes and utensils are also designed to save water. The ice maker is a low water consumption model, thereby using less water to make the same amount of ice. The food steamers in the kitchen use less than 3 GPH (gallons per hour) of water, compared to a standard steamer at 30 GPH.

A pulping station is used in place of a conventional garbage disposal, thereby allowing the composting of food waste which would normally go down the drain and require special treatment by the waste water facility. This pulping station allows refuse from the kitchen and dining area to be pulped/ground into small particles, the water removed, moved to storage containers, picked up by a local recycler and used for compost fertilizer. This item truly operates as a full circle item, where these composted nutrients can be returned to the Earth to fertilize future crops.

Many pieces of kitchen equipment are Energy Star rated, giving Casey some of the most energy efficient equipment available. The kitchen exhaust hoods have special controls that allow the fans to operate at variable speeds. Most exhaust hoods only operate at 100% when on, all the time. Casey's hoods can operate only as needed, anywhere from 10% up to 100%.


PULPING STATION


DISH MACHINE


EXHAUST HOODS

July 27, 2010

Dear Students, Parents and Caregivers,

As Director of Nutrition Services, I would like to extend a warm welcome back to another exciting school year!

As part of our continued improvement efforts, we've reorganized our department into regional kitchens headed by chefs to bring the quality of our products and cooking methods to an even higher level. Exciting changes include new entrees, more menu variety, improved recipes, scratch-cooked pizza, and more side dish choices for your hungry kids.

Look for reusable utensils, cups, plates, bowls, and trays in all elementary and selected other schools, including Casey – no more disposable products!

All schools will continue serving both breakfast and lunch. Farm-fresh produce will be featured on our always-popular salad bars, including as many local and organic products as possible. We continue our quest to completely eliminate all highly processed foods, partially hydrogenated oils, high fructose corn syrup, refined sugar and flour, chemicals, dyes and food additives from our menu. Once again we will serve regional, organic milk and whole-grain baked products. Procurement of local products remains high on our priority list.

Thank you in advance for your continued support – we greatly appreciate it. Know that allowing your children to eat school breakfast and school lunch helps to both assure their health and academic abilities as well as sustain the program. And please don't hesitate to call or email if there's anything we can do to help – we are always open to suggestions.

I have really enjoyed establishing roots here in the Boulder Valley community. I look forward to working in partnership with you in providing all children of BVSD daily access to fresh, flavorful and nutritious food made with wholesome and, when possible, local ingredients, so that every child may thrive.

Ann Cooper
Director of Nutrition Services - Boulder Valley School District

GYMNASIUM & ATHLETICS

The gymnasium, fitness room, and locker rooms require a lot of planning to make sure they work for you. At Casey, keeping comfort and efficiency in mind, we focused on the following:

. Heating & Ventilation
. Acoustics
. Daylighting

PLAY

Heating and Ventilation

The gymnasium uses an energy efficient system comprised of a roof mounted, gas fired, heating and ventilating unit. Ventilation refers to bringing fresh outside air into the space and exhausting "stale" air.

Ample ventilation will be provided, and the amount is controlled by a space CO_2 sensor. As the concentration of carbon dioxide rises within the space, the sensor signals to the control system that the space is filled with occupants, then the ventilation dampers open to allow additional ventilation air into the space to maintain indoor air quality. If the space is lightly occupied or unoccupied, the ventilation dampers will remain nearly closed. Minimizing the amount of ventilation air saves energy. The unit will also provide some cooling with an economizer mode that will bring in excess ventilation (outdoor air) when the room temperature is greater than the outdoor temperature and there is a need for cooling. However, this method of cooling does not ensure that the space will always be sufficiently cool.

You will have the ability to adjust the thermostat by a few degrees to meet your individual comfort needs. The system will be on, achieving the desired temperature during normal occupied times. It may also be used during unoccupied periods, such as an evening event, to bring the room up to normal occupied temperature temporarily. This may take a while depending on the temperature of the room when put into temporary occupied mode.

For energy savings, Boulder Valley School District has chosen not to air-condition gyms. Gyms are very big spaces with a lot of volume to cool, therefore they are some of the hardest and most expensive spaces to cool. To help you understand just how big the space is, your gym has the same volume of 12 - 15 average-sized homes.

Acoustics

Many gyms are very loud, with all of their hard surfaces such as walls, floors and ceilings. Echoes are caused by sound reflecting off of these hard surfaces and returning to your ear, making the space very loud. At Casey there are three things we have done to "soften" these surfaces and make the space more quiet.

1. The metal roof deck contains tiny perforations in the sides of the flutes. Between the flutes is batt insulation which absorbs the sound that passes through the perforations.
2. The CMU (concrete masonry unit) walls have a pattern of linear openings. Similar to the roof deck, sound travels through these openings and is absorbed by batt insulation.
3. Fabric wrapped acoustic panels line the east and west walls to absorb additional sound.

Daylighting

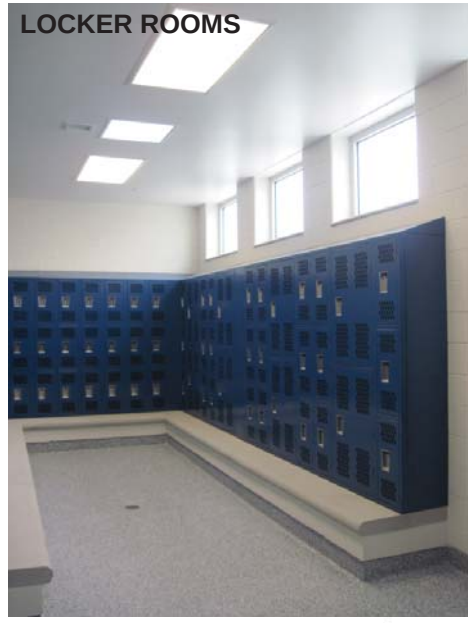
Natural light is evenly distributed in the gym through north and south clerestory (high) windows, and four skylights. Translucent glass is used to provide diffuse light, to help eliminate glare. We are expecting that just a few lights, if any, will need to be turned on during sunny days.

The fitness room has ample north facing windows. Artificial lights may never need to be turned on, except on very overcast days or evenings. Even the locker rooms incorporate natural daylight to help reduce the need for artificial light through the use of tubular skylights and clerestory windows with translucent glass.

ACOUSTICS

NATURAL LIGHT

FITNESS ROOM



LOCKER ROOMS

PLAY

GYMNASIUM & ATHLETICS

PLAY

While some people think about schools as just buildings, there are important site related issues to consider. At Casey Middle School, we focused on:

. Sustainable Site Elements
. Outdoor Classroom
. Themes
. Community & Neighborhoods
. Synthetic Turf


BIO-SWALE

Sustainable Site Elements

There are many practices used to promote an efficient and sustainable landscape around your school.

- Low Water Usage Landscaping – Native seed and low-water planting materials are used throughout the site to reduce the amount of water required for irrigation, as well as provide shade to help reduce excess heat in the landscape.
- Efficient Irrigation – Designed with water conservation in mind, many areas incorporate drip irrigation which gives water directly to plants, not through the air where it can evaporate or land on areas that don't need it. Native grasses initially need irrigation to become established but later will require little support. Irrigation should be run only at night, when plants can "save" the water for the next day and less water is lost due to evaporation. Rain sensors turn irrigation off when it is raining or has just rained. Different irrigation zones are put in place depending on how much water the various landscaped areas need. This allows each zone to get only the amount needed and no more.
- Storm Water System – All rain water that hits the site either soaks into the ground (pervious surfaces such as grass, mulch, crusher fines and other landscaped areas) or runs-off (impervious surfaces such as concrete walks, drives and the building roof). This run-off water is first channeled through bio-swales, and then either a porous landscape detention basin (north of building) or a water quality structure (bus-drive loop). These are all designed to slow down water, which allows it to soak into the ground, clean out pollutants and then allows what is left to slowly leave the site, minimizing potential for flooding downstream.
- Heat Island Effect – Using light colored concrete, in lieu of black asphalt, helps keep the site cooler. Light colored roofs can also help by reflecting heat. Under building parking allows more of the site to be landscaped, also reducing the heat island effect. In addition, the under building parking helps reduce impervious surface area, helping to minimize the amount of storm water run-off.
- Alternative Transportation – Bicycle parking covered with solar panels, as well as priority parking spaces for carpooling and low-emitting vehicles are provided to help promote the use of alternative transportation.
- Green Roof – A small area of the roof is covered with plants. This is beneficial for adding pervious surface to help reduce storm water run-off, reduce the heat island effect, and to make a "dull" roof much more attractive.

Outdoor Classroom

The plaza adjacent to the cafeteria creates an outdoor space where students can gather, as well as a space for outdoor learning. The main feature of the plaza is a grass sloped area, which acts as an outdoor classroom. A connection between the outdoor classroom and the playground is made through the bioswale that runs directly below the playground. The bioswale collects surface runoff water from the playground areas and filters it through the use of native plants and rocks. The water is also allowed to percolate into the ground and water plants rather than leaving the site.

OUTDOOR CLASSROOM

Themes

There are several curriculum-themed areas within the east plaza and playground area. Centrally located in the playground is a spiraling series of quotes, all relating to nature and inspired by Henry David Thoreau, Frank Lloyd Wright, John Muir, and Claude Monet. The geography area includes a latitude transect of the world at the 40-degree latitude (Baseline Road). Students can follow markers along the 40-degree latitude transect from Boulder and discover other cities and places the latitude passes through, including Philadelphia and Sardinia, Italy. Along this transect, students will find a globe, rotated to show this 40-degree latitude, as well as two 4-squares and a tetherball circle. The tetherball circle acts as a compass and an approximate sundial, with north roughly being noon. In addition to geography, the 4-squares include numbers which follow the Fibonacci series, which is an ordering system found throughout nature, including the seed head of a sunflower and a nautilus shell.

“GREEN” ROOF

WEST PLAZA

Community & Neighborhoods

Casey Middle School has always been part of a community of neighborhoods since the day it was built. The new school is designed to be used after hours by the community, especially the auditorium and gym which has its own entrance, giving it further value to the residents it serves. The plaza on the west side of the school has gathering areas for the public, including a stage that can be used for evening or weekend concerts or performances.

Additionally, a community garden space is provided for students, teachers, and the community to grow their own food. Many site elements from the old school are re-used throughout the landscape including landscape boulders, flagstone seats, a climbing boulder, chessboard pavers, memorials, two Casey Middle School stone signs, and a nature/history trail.

Synthetic Turf

The football/soccer field at Casey Middle School isn't composed of grass - it's composed of a synthetic material that looks and feels like grass but requires no water, fertilizer or pesticides. This saves approximately 1.3 million gallons of water per year while still providing a great playing surface that is safe and comfortable. Below the field is an oversized drainage system for storm water run-off which is stored, then slowly released down stream to help minimize flooding.

MATERIALS

TOUCH

Materials are the tactile parts of our buildings – the finishing touches that make it unique. Casey Middle School incorporates several materials and products that make it one of a kind:

. Recycled & Regional Materials
. 1924 Building Reuse
. Low VOCs
. Spray Foam Insulation
. Glazing & Sunshades
. FSC Wood

Recycled and Regional Materials

When selecting materials for your school, the designers asked themselves several questions:

- How far did the material have to travel to get to the site?
- How much energy did the product take to produce?
- How much recycled material was used to make the product?

These questions are important for several reasons. First, locally-sourced material take less energy to transport, saving significant amounts of energy. Buying locally also helps support jobs and economic sustainability in your region.

Embodied energy encompasses the amount of energy it takes to make a product and put it in a building. If we use materials that take a lot of energy, or we use more materials than we really need for a building, we run the risk of denying other people the use of precious resources.

Finally, products that incorporate a high percentage of recycled material prevent increased waste from entering landfills and reduces the natural resources that must be extracted from the Earth.

Materials with recycled content at Casey:
rubber beads in artificial turf, steel rebar, CMU (concrete masonry units), structural steel, steel bar joists, metal deck, metal studs, eco resin panels at stairs, lockers, carpet, ceiling tiles, ceramic wall tile, toilet partitions and many other products.

1924 Walls

After much deliberation and cost analysis, the Boulder Valley School District made a significant commitment to save two of the original 1924 walls. This involved careful demolition of the adjacent library addition and existing school, underpinning of the foundation, and steel bracing to keep the walls in place while the new school was built. Over 50% of the building demolition waste was recycled.

The result is dynamic spaces such as the teachers' lounge, the art classroom, and the library that allow students to experience the original building and restore its majestic presence at the corner of High and 13th Streets.

ORIGINAL 1924 GYMNASIUM

1924 Gym Floor

Generations of people have passed through Casey Middle School, and stories and lore have surfaced about the original gymnasium and it's wood floor that was in pristine condition after more than 80 years of use. The design team wanted to find a unique way to commemorate the original building, so the gym floor from the 1924 gym was carefully removed, protected during construction, and re-installed on some of the walls, floors, and even some benches in the new 2010 building.

Healthy Materials - Low VOCs

VOCs (Volitile Organic Compounds) are organic, chemical compounds that have high vapor pressures that enter the atmosphere. It is often what you smell in a new building, and they are not always healthy to breathe. Low VOC products do not contain toxic compounds and do not smell, or if they do they are generally much safer to breathe. Wherever possible, low, or no, VOC products are used in Casey. This includes paints, adhesives, sealants, flooring, and all composite wood (such as plywood, particle board, and MDF (medium-density fiberboard)). In addition, all composite wood has no added urea-formaldehyde.

Many older schools have VCT (vinyl composition tile) flooring, which contains vinyl, or PVC (polyvinyl chloride), which is a known carcinogen. At Casey, we have replaced VCT with Linoleum, which is an organic flooring material made from linseed oil, pine resins, and wood flour with a natural jute (plant fibers or “burlap”) backing.

The flooring in the kitchen and restrooms is a poured, seamless, low VOC acrylic flooring without any seams or joints. This will require minimal maintenance without any special cleaning agents or equipment.

LINOLEUM

Spray Foam Insulation

When designing a wall assembly, dew point is an important factor to consider. In winter, exterior air is cooler and drier than interior air. This cooler air cannot hold as much moisture so there is a transition point, or dew point, in the wall where water will begin to condense. You can see this when you take a shower and the windows fog up from the steam. Casey Middle School utilizes a closed-cell, spray foam insulation, which acts as an air barrier, an insulator, and a vapor barrier all in one. This '3-in-1' protection with high insulating value shifts the dew point to be 'outside' of the wall, meaning that condensation from temperature differences won't build up inside of the wall cavity and encourage rot or the growth of mold.

Spray foam insulation is a very efficient product, as it provides a continuous blanket of insulation around the building. Typical buildings have board and batt insulation, which consist of many small pieces creating many seams and joints. These seams and joints are the weak points, which create paths for water and air to penetrate the building envelope (exterior walls and roof).

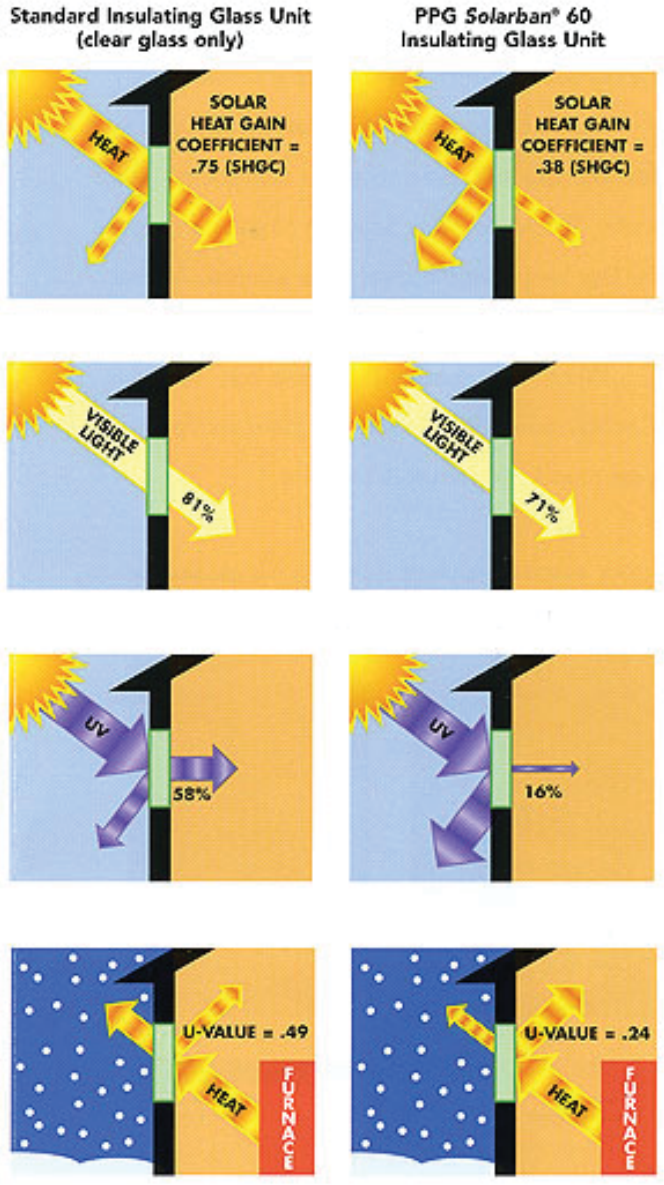
Glazing & Sun Shades

Unless you look very closely, you might not notice that there are different kinds of glass in different windows in the building. In the Northern Hemisphere, where we live, the sun is usually in the southern part of the sky. This means it shines mainly on the south side of the building. In the morning it hits the east side and if it's not cloudy in the afternoon, it hits the west side. So that you don't get too much heat from sun coming in through the windows, the windows have a special coating between the two layers of glass which adds shading and only allows a small percentage of heat and UV (ultraviolet) light through. UV light can fade furniture, flooring and other finishes.

To reduce glare from direct sun, the south windows are tinted. Glass on the north side of the building into most of the classrooms has less shading and can let more light through since it's indirect. In the classrooms, the higher windows are even more clear, allowing more light to bounce off the sloped ceiling and reflect deeper into the classrooms.

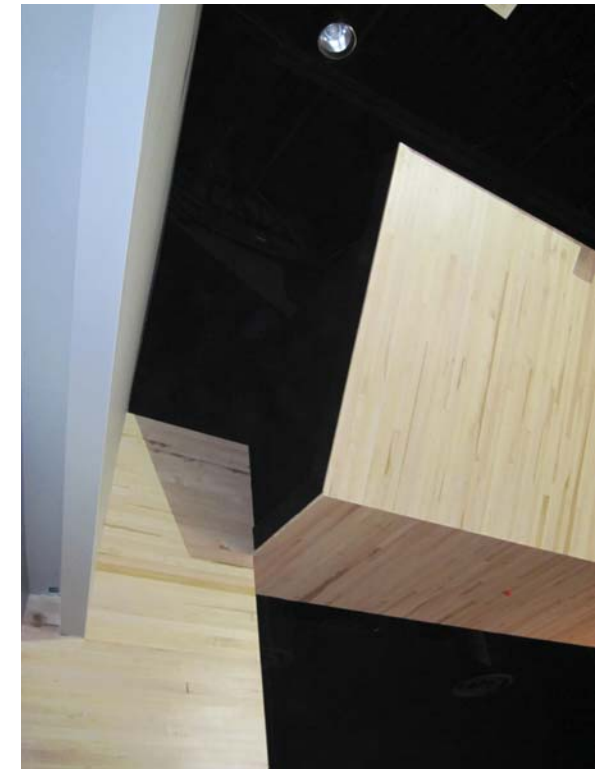
The windows in the gymnasium are made of a translucent material with high insulation values. The light in the gym is very diffuse so there isn't any glare or shadows to interfere when you're playing or watching sports.

On the outside of the building are metal sun shades on the south windows. The grated material over the window provides shade to reduce direct sun into the room, but allows enough light through to brighten up the room so you can use natural daylight instead of electric lights.



FSC Certified Wood

FSC (Forest Stewardship Council) is an organization established to promote responsible management of forests. For Casey, the doors, casework, wood gym flooring, auditorium wood stage flooring, and proscenium are all FSC Certified wood. This ensures us that the wood has been harvested and manufactured by companies that meet FSC's stringent requirements concerning social, economic and environmental responsibilities.



BUILDING SYSTEMS & ENERGY

To support all of the people and activities in your school, it's mechanical, electrical and plumbing systems need to work well. It helps if they can be as energy efficient as possible, too… so the school district's resources go towards students and teachers - not utility bills.

Lighting Control

The general building lighting control system automatically turns off interior common areas and exterior lights at pre-determined times. Common areas and corridors can be manually turned on with local over-ride switches located at the main entrances into the area. These switches operate in the “on” mode only during normal school times and are enabled for on/off operation for after hours. In addition to the local over-ride switches, one global common area over-ride switch bank is located in the administration area for control of general areas.

Lights in daylit areas, such as common areas, corridors, and classrooms, are controlled with photocells. Lighting shall switch “on” if the photocell detects light level is below the programmed light level. If the photocell detects light is above the programmed light level, the lights will turn off, or will not be allowed to be manually turned on until the light level falls back below the programmed light level. The lighting control system provides provisions for continuous monitoring of lighting signals to verify proper operation of lighting controls with required lighting levels. Local override switches or dimmers provide occupant control to turn lights down or off.

The lighting control system is programmed to allow control of all the emergency light fixtures when normal power is present. Emergency lights are to be on, in an emergency event, to ensure the exit path is illuminated. These emergency lights will automatically turn on upon loss of normal power and generator start up.

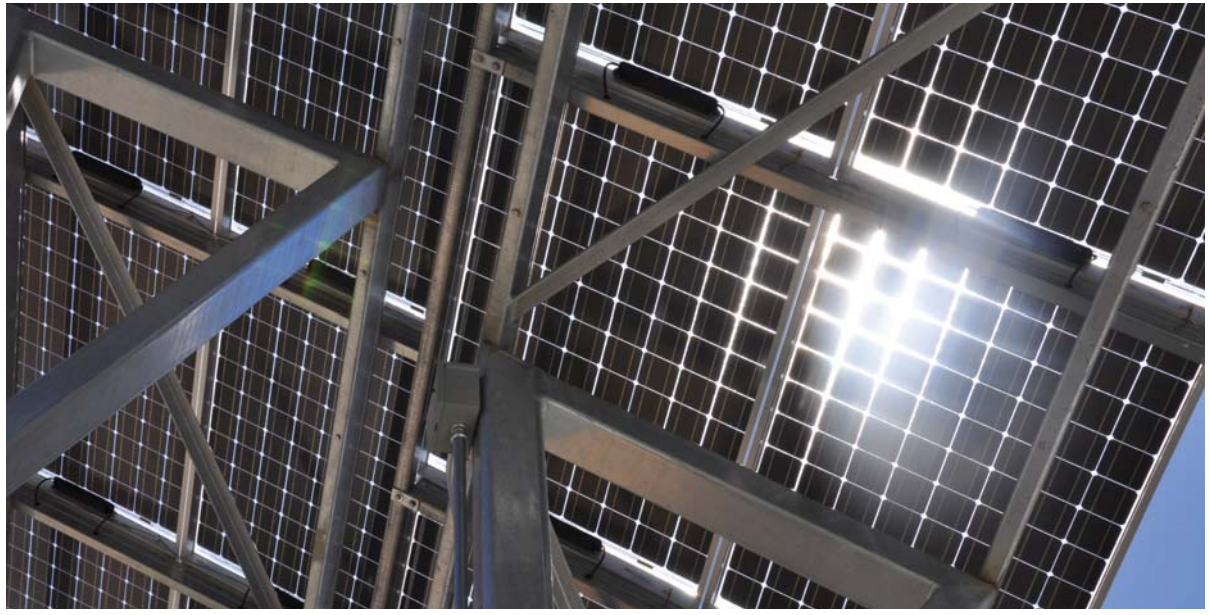
In the administration area, the occupancy sensor in each office operates in “off” only mode. This means that the lights need to be switched on manually when you enter a room. When you leave the room, you can switch the lights off manually or if you neglect to do so, the occupancy sensor will turn the lights off after a maximum of 30 minutes of no movement in the room.

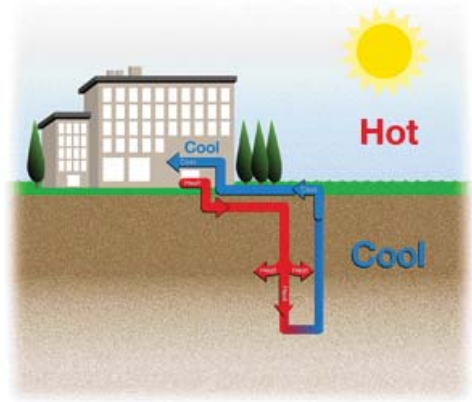
Many schools only have one electrical meter, which measures the building’s overall electrical use. At Casey, there are several sub-meters, which allow us to measure how much each “area” is using. This extra monitoring helps with troubleshooting and gives us information to help make more energy efficient choices down the road. These sub-meters also allow us to see how much electricity is being consumed by lighting on each different level, by the kitchen equipment and by mechanical equipment such as HVAC and fans.

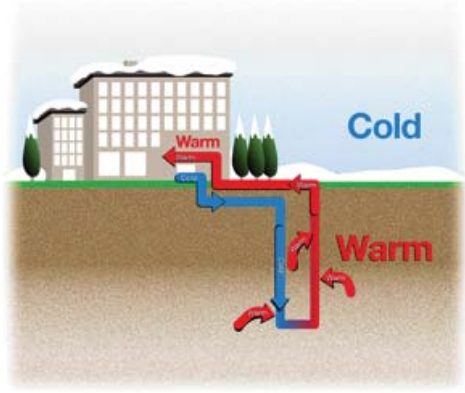
Photovoltaics

The PV array is a 26.8 kW system, estimated to produce 38,000 kWh per year. To help you understand, this is roughly the same amount of energy used to power four average-sized homes per year. This design will account for up to 4.5% of the school's anticipated, total annual electrical use. The solar panels are designed to help shade south facing windows of the administration offices. They are also designed to shed water and provide shade for the bicycle parking below.

Green Touch Screen (photo below) - This will provide an interactive method for students and/or the public to access a variety of information. It can provide building performance data such as energy use, ground source heating/cooling data, and PV production data. It can also provide information pertaining to LEED and many of the building's green features.





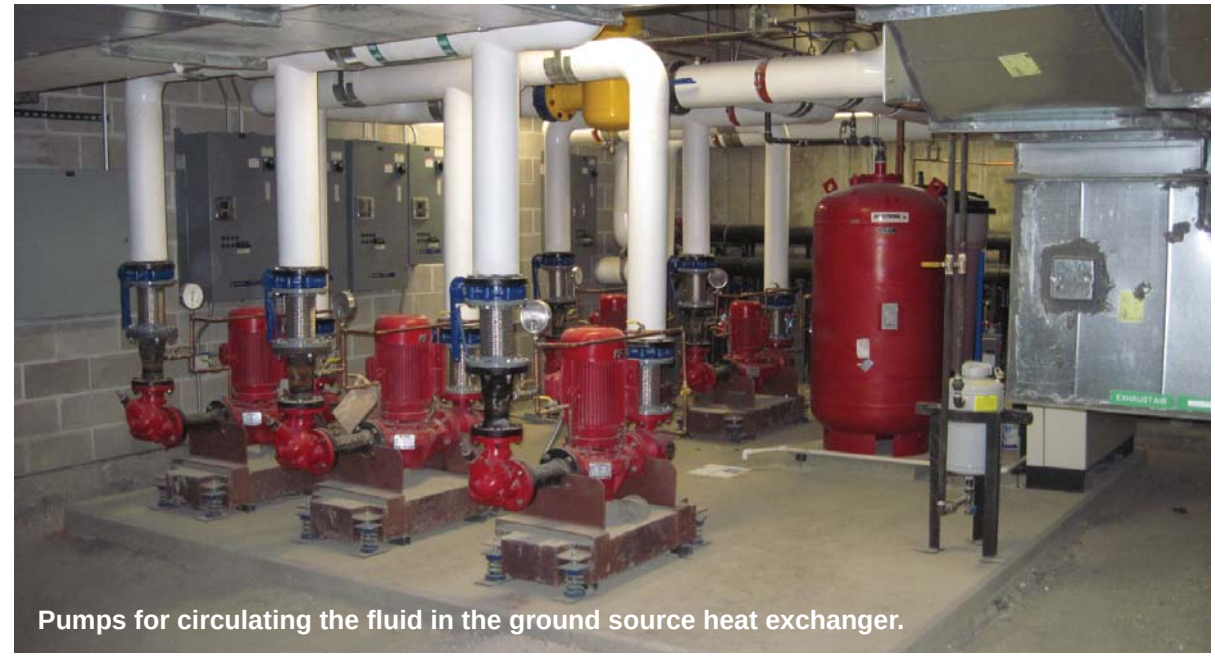


Heating, Ventilating, and Air Conditioning

Ground Source Heat Exchanger

The ground source heat exchanger is a buried piping system consisting of vertically drilled, closed loop boreholes (70 holes at 370 feet deep each) and horizontally trenched piping headers. Heat is transferred to and from the ground heat exchanger by means of a circulating heat transfer fluid. The circulation fluid is first pumped through the heat pumps within the facility where heat is either rejected to the fluid (summer) or extracted from the fluid (winter). This fluid is then circulated through the ground heat exchanger where heat is either rejected to the ground (summer) or extracted from the ground (winter). In essence, the ground source heat exchanger is a large thermal storage system. In the winter, heat for the building is extracted from this heat sink. In the summer, heat from the building is rejected to this heat sink.

Heat is also transferred between the ground heat exchanger and the soil and groundwater surrounding it, as well as the ambient atmosphere above. The surrounding soil and atmosphere act on this heat sink and tend to drive the temperature within the ground heat exchanger to the normal steady state undisturbed ground temperature (58.8 degrees F). The circulation fluid is an antifreeze mixture of water and propylene glycol, which protects against potential freezing issues and allows the heat pumps to operate in extended temperature ranges. Extended temperature range operation design allowed the ground heat exchanger to be sized more economically than if antifreeze was not installed.



Pumps for circulating the fluid in the ground source heat exchanger.

Typical Classrooms and Building Spaces

Ample ventilation is being provided via an energy recovery ventilation (ERV) unit, which reuses waste heating or cooling from the building ventilation system before being exhausted outside. Equipment will run during normal occupied periods to provide heating/cooling/ventilation. You will have the ability to adjust the space temperature setpoint by a few degrees to meet your individual comfort needs. The space temperature sensor may be used during unoccupied periods to bring the room up to normal occupied temperature temporarily. This may take a while depending on the temperature of the room when put into temporary occupied mode. Operable windows have been provided in all classrooms but please do not open windows if the room is perceived to be too hot, too cold or too stuffy as this will waste energy. Windows are recommended to be used only for odor problems and during moderate outdoor temperatures (spring and fall).

Several classrooms including science rooms and the shop are provided with general room exhaust fans. These fans may be operated by a manual button/timer in the room when there is a need for exhaust due to odors or dust/debris in the air.

Due to chemical storage, science prep rooms are being exhausted 24/7 and there is no occupant control over this fan. The fume hood has been provided with an independent exhaust fan. This exhaust fan may be manually operated similar to general room exhaust fans.

Planning Rooms, Interior Conference Rooms, and Office Spaces

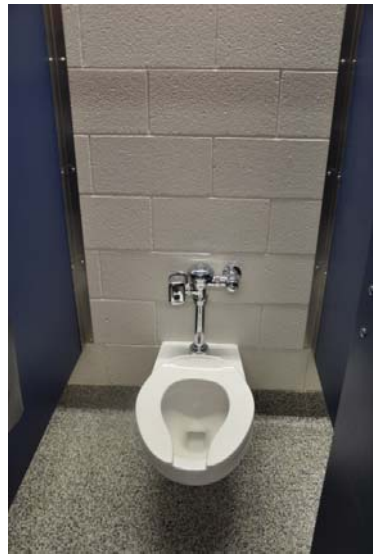
Please note that for these types of spaces one heat pump unit will serve several rooms and there will only be one temperature sensor located in one of the rooms. Occupants in rooms without temperature sensors may need to have their room air diffusers adjusted by BVSD maintenance to provide more or less airflow if their room is too hot or too cold.

Kitchen

The kitchen is being heated and ventilated with an energy efficient system comprised of a gas-fired heating and ventilating unit. The amount of ventilation (outside air) provided is controlled by a space pressure sensor to provide adequate ventilation in the most energy efficient manner. Space pressurization is being controlled to a negative pressure to prevent kitchen odors from contaminating adjacent spaces. If extra ventilation is required, one or more of the kitchen hood exhaust fans may need to be operated. The unit will also provide some cooling with an economizer that will bring in excess ventilation (outdoor air) when the room temperature is greater than the outdoor temperature and there is a need for cooling. If there is a need for cooling in the space, the staff may need to operate one or more of the kitchen hood exhaust fans. This method of cooling does not ensure that the space will always be sufficiently cool, particularly when the outdoor temperature is higher than the indoor temperature. The staff will have the ability to adjust the space temperature setpoint by a few degrees to meet their individual comfort needs. See “typical classrooms and building spaces” section on this page for temperature settings during unoccupied periods.


HEAT PUMP


ERV



Locker Rooms, Fitness Room, and Associated Spaces

These spaces are being heated and ventilated similar to the gymnasium. Some cooling is available as well, similar to the gym, however, this method of cooling does not ensure that the space will always be sufficiently cooled. Please note that for these type of spaces one heating and ventilating unit will serve several rooms and there will only be one temperature sensor located in one of the rooms. Occupants in rooms without temperature sensors may need to have their room air diffusers adjusted by BVSD maintenance to provide more or less airflow if their room is too hot or too cold (example, the room is too hot and the system is providing heating then reduce airflow, or the room is too cold and the system is providing heating then increase airflow). Operable windows have been provided in the fitness room but please do not open these windows if the room is perceived to be too hot, too cold or too stuffy as this will waste energy. Windows are recommended to be used only for odor problems and during moderate outdoor temperatures (spring and fall).

Plumbing

Water closets (toilets) and urinals are water conserving fixtures with automatic sensor activation. Lavatories (handwashing sinks) are low flow for water conservation, with manual activation. Other utility sinks, showers, drinking fountains, and emergency shower/eyewash fixtures in science rooms are all standard flow rates with manual activation.

Hot water is being provided by one of two gas fired water heaters or one of four electric water heaters. The main gas fired water heater (for the core of the building) and two of the electric water heaters are provided with circulation. It may take a short while for hot water to arrive during first use, and substantially longer during unoccupied hours when the circulation pump is off.

Commissioning and "Measurement and Verification"

BVSD has chosen to hire a commissioning agent to perform both the "enhanced commissioning" and "measurement and verification". Commissioning is a means to ensure the building systems operate as efficiently as designed and that the maintenance staff is trained to operate and maintain the equipment. Measurement and verification means that processes and equipment are put into place to allow the building to be measured after one year of operation to ensure original design efficiencies and operations are met, or exceeded.

GREEN CERTIFICATIONS

AWARD

Casey Middle School was initially designed to achieve LEED Gold in the LEED for Schools rating program. Established by the US Green Building Council, LEED (Leadership in Energy and Environmental Design) is a means of 3rd party verification of a building's 'green' qualities. We have been able to surpass our initial goal of LEED Gold and are currently on target for LEED Platinum, the highest level possible.

GREEN CERTIFICATIONS

AWARD

	Y	?+	?-	N		Project: Casey Middle School	
	56	3	2	20		LEED for Schools Total Project Score	
						Certified 26 to 36 points **Silver** 37 to 43 points **Gold** 44 to 57 points **Platinum** 58+ points (up to 79)	
index	Yes (1)	High Probability	Low Probability	No (N)	Credit #	Credit Name	LEED Requirement
1	13	1	0	2		Sustainable Sites (SS)	
2	P	P	P	P	SSp1	Construction Activity Pollution Prevention	ESC plan describing measures implemented to prevent loss of soil, sedimentation, and pollution.
3	P	P	P	P	SSp2	Environmental Site Assessment	Conduct a Phase I Environmental Site Assessment (ASTM E1527-05), if contamination is suspected conduct a Phase II assessment. AND Sites that are contaminated due to past existence as a landfill within 1000 feet of the site are prohibited. If the site is otherwise contaminated, it must be remediated to meet local, state, or federal EPA region residential standards.
4	1				SSc1	Site Selection	Avoid habitat, parkland, farmland, wetlands (100')
5	1				SSc2	Development Density & Community Connectivity	OPTION 2 - Project is within 1/2 mile of a residential zone with an average density of 10 units per acre AND within 1/2 mile of at least 10 Basic Services AND with pedestrian access between the building and services.
6	1				SSc3	Brownfield Redevelopment	Develop on a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment) OR on a site classified as a brownfield by a local, state or federal government agency. Effectively remediate site contamination.
7	1				SSc4.1	Alternative Transportation, Public Transportation Access	Project within 1/2 mile of a commuter rail, light rail or subway station OR within 1/4 mile of one or more stops for two or more public or campus bus lines usable by building occupants OR 80% of students live within 3/4 mile for 8th grade and below and 1 1/2 for 9th grade and above AND pedestrian access from the site to residential neighborhoods. FOR ALL OPTIONS - provide dedicated walking or bike routes that extend from the building to the end of the property in two or more directions.
8	1				SSc4.2	Alternative Transportation, Bicycle Use	Provide secure bicycle racks and/or storage (within 200 yards of building entrance) for 5% or more of all building staff and students above 3rd grade level. AND Provide shower and changing facilities for .5% of FTE staff AND Provide dedicated bike lanes that extend at least to the end of the school property in 2 or more different directions, without boundaries on school property.
9	1				SSc4.3	Alternative Transportation, Low Emitting and Fuel Efficient Vehicles	OPTION 2 - Provide preferred parking for 5% of parking capacity AND provide one space for carpool drop-off marked for LEV.
10	1				SSc4.4	Alternative Transportation, Parking Capacity	OPTION 3 - For projects that have no zoning requirements provide 25% fewer parking spaces than the standard listed in the 2003 Institute of Transportation Engineers (ITE) "Parking Generation Study."
11				N	SSc5.1	Site Development, Protect or Restore Habitat	Infill - Restore or protect a minimum of 50% of the site area (excluding the building footprint) with native or adapted vegetation. Projects earning SS Credit 2 and using vegetated roof surfaces may apply the vegetated roof surface to this calculation if the plants meet the definition of native/adapted.
12	1				SSc5.2	Site Development, Maximize Open Space	Option 1 Reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%.
13	1				SSc6.1	Stormwater Management, Quantity Control	Option 1 - If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development peak discharge rate and quantity from exceeding the pre-development peak discharge rate and quantity for one and two year, 24-hour design storms; OR Implement a stormwater management plan that protects receiving stream channels from excessive erosion by implementing a stream channel protection strategy and quantity control strategies.
14	1				SSc6.2	Stormwater Management, Quality Control	Best Management Practice (BMP) to capture and treat 80% Total Suspended Solids (TSS) for 90% average annual rainfall
15	1				SSc7.1	Heat Island Effect, Non-Roof	For 50% for the site hardscape (including roads, sidewalks, courtyards and parking lots), provide: - Shade (within 5 years of occupancy) - Paving materials with Solar Reflectance Index of at least 29 - Open grid pavement systems OR place a minimum of 50% of parking spaces underground or covered.
16				N	SSc7.2	Heat Island Effect, Roof	Install high reflective roofing (for low-sloped roof ≤ 2:12), SRI ≥ 78; for steep-sloped (> 2:12), SRI ≥ 29) for 75% of area OR vegetated "green" roof for 50%
17	1				SSc8	Light Pollution Reduction	FOR INTERIOR LIGHTING - OPTION 1 - All non-emergency interior lighting with a direct line of sight to any opening shall ha it's input power reduced by at least 50% between 11PM and 5AM. A manual or occupant sensing override that last no longer than 30 minuted is allowed. FOR EXTERIOR LIGHTING - Not to exceed 80% LPD for exterior lighting and 50% LPD for façade / landscape lighting. Minimize footcandles at site boundary. Athletic field lighting must have auto-shutoff after 11PM, manual overide is allowed.
18		?			SSc9	Site Master Plan	If the project achieves 4 of 7 of SS Credits: 1, 5.1, 5.2, 6.1, 6.2, 7.1, 8, then recalculate those credits using date from the master plan. AND The master plan must be developed in collaboration with the school board or other decision-making body. The master plan must include current and future construction activity that affects the site, within the building's lifespan.
19	1				SSc10	Joint Use of Facilities	OPTION 1 - In collaboration with the school board, ensure that at least 3 of the following spaces are accessible for shared use by the general public Auditorium; Gymnasium; Cafeteria; one or more Classrooms; Playing Fields

20	5	0	0	2		**Water Efficiency (WE)**	
21	1				WEc1.1	**Water Efficient Landscaping, Reduce by 50%**	Reduce potable water consumption for irrigation by 50% over local baseline.
22				N	WEc1.2	**Water Efficient Landscaping, No Potable Water use or No Irrigation**	Use 100% non-potable water for irrigation, and have 50% reduction in irrigation demand OR install landscaping that does not require permanent irrigation systems. Allow one year for plant establishment.
23				N	WEc2	**Innovative Wastewater Technologies**	Reduce potable water for sewage conveyance by 50% compared to EPAct 1992.
24	1				WEc3.1	**Water Use Reduction: 20% Reduction**	Reduce water use by 20% compared to EPAct 1992.
25	1				WEc3.2	**Water Use Reduction: 30% Reduction**	Reduce water use by 30% compared to EPAct 1992.
25	1				WEc3.2	**Water Use Reduction: 40% Reduction**	Reduce water use by 40% compared to EPAct 1992.
26	1				WEc4	**Process Water Use Reduction: 20% Reduction**	No refrigeration equipment using once-through cooling with potable water AND No gargbage disposals AND At least 4 process items: cloths washers; dish washers, ice machines, food steamers, pre-rinse spray valves; where water use is at or below the levels in reference guide.
27	14	0	2	1		**Energy and Atmosphere (EA)**	
28	P	P	P	P	EAp1	**Fundamental Commissioning of the Building Energy Systems**	Independent Cx agent to review owner's BOD, incorporate Cx requirements into CDs, develop Cx plan, verify installation and performance of Cx systems, complete Cx report summary.
29	P	P	P	P	EAp2	**Minimum Energy Performance**	Building to meet ASHRAE 90.1-2004. Establish Energy Performance Rating goal for facilitly design using EPA Target Finder tool.
30	P	P	P	P	EAp3	**Fundamental Refrigerant Management**	No CFC based refrigerants.
31	1				EAc1.1	**Optimize Energy Performance 11.5%**	Whole building energy simulation based on ASHRAE 90.1-2004 (1-10 pts); OR Advanced Building Core Performance (Available 2009)
32	1				EAc1.2	**Optimize Energy Performance 14%**	
33	1				EAc1.3	**Optimize Energy Performance 17.5%**	
34	1				EAc1.4	**Optimize Energy Performance 21%**	
35	1				EAc1.5	**Optimize Energy Performance 24.5%**	
36	1				EAc1.6	**Optimize Energy Performance 28%**	
37	1				EAc1.7	**Optimize Energy Performance 31.5%**	
38	1				EAc1.8	**Optimize Energy Performance 35%**	
39	1				EAc1.9	**Optimize Energy Performance 38.5%**	
40			?		EAc1.10	**Optimize Energy Performance 42%**	
41	1				EAc2.1	**On-Site Renewable Energy, 2.5%**	On-site solar, wind, hydro or biomass for specified percentage of total annual energy cost
42			?		EAc2.2	**On-Site Renewable Energy, 7.5%**	
43				N	EAc2.3	**On-Site Renewable Energy, 12.5%**	
44	1				EAc3	**Enhanced Commissioning**	Third party Cx agent to review owner's BOD prior to CD, review contractor submittals, develop systems manual, verify that training requirements are completed, develop Cx plan.
45	1				EAc4	**Enhanced Refrigeration Management**	Refrigerants combining low global warming and ozone depleting potential.
46	1				EAc5	**Measurement & Verification**	M&V plan that evaluates building/system performance, compares predicted to actual performance. Consistent with Option B or D of IPMVP, Vol.3; shall cover a period of no less than one year of occupancy AND provide corrective action.
47	1				EAc6	**Green Power**	Two years of certified green power for 35% of electricity use. School districts can purchase green power on a centralized basis and allocate to specific project.

48	5	1	0	7		**Materials and Resources (MR)**	
49	P	P	P	P	MRp1	**Storage & Collection of Recyclables**	Recycling collection and storage area(s) for convenient occupant recycling of paper, cardboard, glass, plastics, and metals AND provide a separate area for collection and storage of plant-based landscaping debris.
50				N	MRc1.1	**Building Reuse, Maintain 75% of Existing Walls, Floors & Roof**	Maintain 75% (based on surface area) of existing structure (floor and roof decking), envelope (skin and framing, excluding windows). Excludes hazmats.
51				N	MRc1.2	**Building Reuse, Maintain 95% of Existing Walls, Floors & Roof**	See MR Credit 1.1
52				N	MRc1.3	**Building Reuse, Maintain 50% of Interior Non- Structural Elements**	Use existing interior non-structural elements in at least 50% (by area) of the completed building (including additions).
53	1				MRc2.1	**Construction Waste Management, Divert 50%**	Recycle / divert demo and construction waste through on-site separation or commingling program
54				N	MRc2.2	**Construction Waste Management, Divert 75%**	
55				N	MRc3.1	**Material Reuse (salvaged materials), 5%**	Specify salvaged, reused or refurbished materials for specified percentage of total materials costs.
56				N	MRc3.2	**Material Reuse (salvaged materials), 10%**	
57	1				MRc4.1	**Recycled Content, 10% (post-consumer + 1/2 pre-consumer)**	Specify products with high recycled content including steel, concrete, gypsum, partitions, tile, etc. (specified percentage of total material costs)
58		?			MRc4.2	**Recycled Content, 20% (post-consumer + 1/2 pre-consumer)**	
59	1				MRc5.1	**Regional Materials, 10% Extracted, Processed & Manufactured Locally**	Specify products harvested and manufactured within 500 miles of the site (specified percentage of total materials cost).
60	1				MRc5.2	**Regional Materials, 20% Extracted, Processed & Manufactured Locally**	
61				N	MRc6	**Rapidly Renewable Materials**	Specify renewable materials for 2.5% of total materials costs.
62	1				MRc7	**Certified Wood**	50% of all wood based products (including framing, flooring, doors, etc.) to be FSC certified. Only include materials permanently installed. Furniture also, if included in MR 3-7. 95% = ID credit.
63	13	1	0	8		**Indoor Environmental Quality (IEQ)**	
64	P	P	P	P	EQp1	**Minimum IAQ Performance**	Meet ASHRAE 62.1-2004 through ventilation rate procedure for ventilation systems.
65	P	P	P	P	EQp2	**Environmental Tobacco Smoke (ETS) Control**	Prohibit smoking in the building - Locate any exterior designated smoking areas at lest 25 feet away from entries, outdoor air intakes and operable windows
66	P	P	P	P	EQp3	**Minimum Acoustical Performance**	Design classrooms and learning spaces to meet the Reverberation Time (RT) requirements of ANSI Standard S12.60-2002, and the Sound Transmission Class (STC) requirements, excepting windows which must meet an STC rating of at least 35. AND OPTION 1 - Using methodology in ANSI achieve background noise level in classrooms of 45 dBA. OPTION 2 - Design classrooms and other learning spaces using 2003 HVAC Appliacations ASHRAE Handbook, Chapter 47, and achieve an RC(N) Mark II level of 37.
67				N	EQc1	**Outdoor Air Delivery Monitoring**	Install permanent monitoring system that provide feedback (generate an alarm) when conditions vary by 10% or more from set point. For Mechanically Ventilated spaces - Monitor CO2 concentrations within all densely occupied spaces. For non-densely occupied spaces, provide a direct outdoor airflow measurement device capable of measuring the minimum outdoor airflow rate.
68				N	EQc2	**Increased Ventilation**	For Mechanically Ventilated spaces - Increase breathing zone outdoor air ventilation rates to all occupied spaces by at least 30% above the minimum rates required by ASHRAE Standard 62.1-2004.
69	1				EQc3.1	**Construction IAQ Management Plan, During Construction**	Develop and implement IAQ management plan that meets SMACNA, protects absorptive construction materials, and (if air handler is used during construction) incorporates MERV 8 filters during construction and prior to occupancy. Prohibit smoking within 25 feet of the building entrances once building is closed.
70	1				EQc3.2	**Construction IAQ Management Plan, Before Occupancy**	(1) 14,000 CF/SF flush out at 60 degrees / 60% RH prior to occupancy; OR (2) 3,500 CF/SF flush out prior to occupancy, then 0.30 CF/SF daily to 14,000 CF/SF total; OR (3) IAQ test prior to occupancy per US EPA.
71					EQc4	**Low-Emitting Materials**	As of 6/08 requirements the same as LEED-NC (4 points available for six potential strategies)
71	1				EQc4.1	**Low-Emitting Materials, Adhesives & Sealants**	All adhesives and sealants within weather barrier shall meet the testing and product requirements of California Dept. of Health (CDH) - Standard Practices for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers; inlcuding 2004 Addenda
72	1				EQc4.2	**Low-Emitting Materials, Paints**	All paints and coatings to meet CDH guidelines.
73	1				EQc4.3	**Low-Emitting Materials, Floorings**	All flooring systems to meet CDH guidelines.
74	1				EQc4.4	**Low-Emitting Materials, Composite Wood & Agrifiber**	All composite wood and agrifiber products (including plywood, particleboard, MDF, etc.) within the weather barrier to meet CDH guidelines.
				N	EQc4.5	**Furniture and Fittings**	All new furniture and furnishings, less than one year old, to meet one of the following: A) GREENGAURD Children and Schools CertifiedSM B) Calculated indoor concentrations to meet EPA's ETV Large Chamber test protocol. C) Calculated indoor concentrations to meet BIFMA
				N	EQc4.6	**Ceilings and Wall Systems**	All gypsum board, insulation, acoustical ceiling systems and wall coverings to meet CDH guidelines.
75				N	EQc5	**Indoor Chemical & Pollutant Source Control**	Employ entry mats (6' long in direction of travel) at major entrances, exhaust and separate areas of chemical use, with an exhaust rate of .50 cfm/sf with no air-recirculation. Incorporate MERV-13 filters in ventilation systems of regularly occupied areas. Install containment drains for appropriate disposal of hazardous liquid waste.

76	1				EQc6.1	**Controllability of Systems, Lighting**	Provide individual lighting controls for 90% (minimum) of administrative offices and regularly occupied spaces to enable adjustments to suit individual task needs and preferences AND for classrooms and core learning spaces provide systems that operate in two modes: general (35 - 50 fc at desk level) and AV (10-20 fc).
77	1				EQc6.2	**Controllability of Systems, Thermal Comfort**	Provide thermal comfort controls or operable windows for 50% of occupants and for shared multi-occupant spaces.
78				N	EQc7.1	**Thermal Comfort, Design**	Design HVAC systems to meet ASHRAE 55-2004 (temperature and humidity).
79				N	EQc7.2	**Thermal Comfort, Verification**	Implement thermal comfort survey of occupants 6-18 months after occupancy. Plan should be developed in accordance with ASHRAE for all adults and students grade 6 and above.
80	1				EQc8.1	**Daylight & Views, Daylight 75%, 90% of Classrooms, 75% of other spaces**	Achieve a daylighting factor of 2% by simulating daylight OR measuring daylight OR calculating daylight zone in 75 - 90% (1-2 pts) of all classrooms and core learning space; 75% (1 pt.) of all other regularly occupied spaces
	1					**90% Classrooms**	
		?				**75% of other spaces**	
81	1				EQc8.2	**Daylight & Views, Views for 90% of Spaces**	Incorporate views to exterior for 90% of occupants
82	1				EQc9	**Enhanced Acoustical Performance**	Meet Impact Insulation Class (IIC) requirements of ANSI S12.60-2002. AND OPTION 1 - Using ANSI achieve a maximum unoccupied background noise level in classrooms of: 40 dBA (1pt); 35 dBA (2pts) OPTION 2 - Using 2003 ASHRAE HVAC Applications Handbook, achieve RC level of: 32 (1pt); 27 (2pts)
82	1				EQc9.1	**Enhanced Acoustical Performance**	
83				N	EQc10	**Mold Prevention**	Project teams must achieve EQ credits: 3.1, 7.1, 7.2 AND Provide HVAC systems and controls designed to limit relative humidity to 60% or less AND Develop and implement an IAQ management program for buildings based on EPA document "Building Air Quality: A Guide for Building Owners and Facility Managers."
84	**6**	**0**	**0**	**0**		**Innovation and Design (ID)**	
85	1				IDc1.1	**Innovation and Design 1.1**	Low impact Cleaning and Maintenance Equipment
86	1				IDc1.2	**Innovation and Design 1.2**	Double open space
87	1				IDc1.3	**Innovation and Design 1.3**	Zero Waste - Cafeteria
88	1				IDc1.4	**Innovation and Design 1.4**	SSc10 - Meet 2 of 3 of Joint Use of facilities
89	1				IDc2	**LEED™ Accredited Professional**	At least one principal participant of the project team shall be a LEED Accredited Professional (AP).
90	1				IDc3	**The School as a Teaching Tool**	Design curriculum based on the high performance features of the building, and commit to implementing the curriculum within 10 months of LEED certification. It must meet local or state standards, be approved by school administrators, and provide 10 or more hours of instruction per year, per student.

ENERGY STAR

Casey Middle School meets the requirements for the Environmental Protection Agency's recognition of "Designed to Earn the ENERGY STAR". A minimum score of 75 out of 100 is required. Casey is estimated at 83, compared to an average building score of 50.

Within 24 months of occupancy, Boulder Valley School District is encouraged to apply for the "ENERGY STAR" qualified building label. This allows the building to be scored based on actual energy use.

AWARD