

FAMILY JUSTICE CENTER COURTHOUSE

SUPERIOR COURT OF CALIFORNIA, COUNTY OF SANTA CLARA



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SUSTAINABILITY FEATURES

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1 SUSTAINABILITY FEATURES

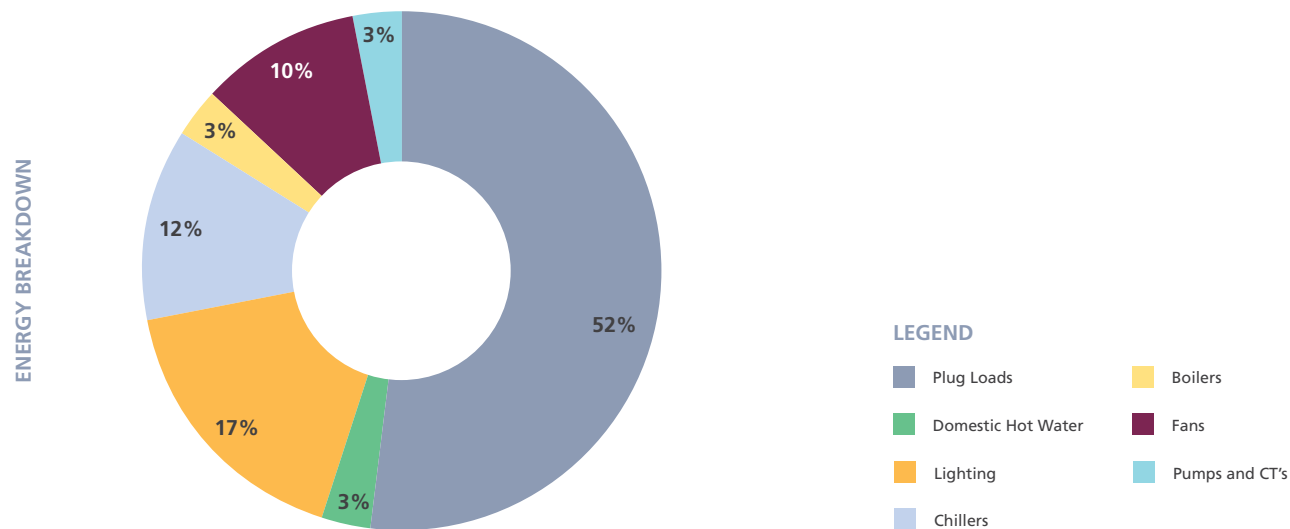
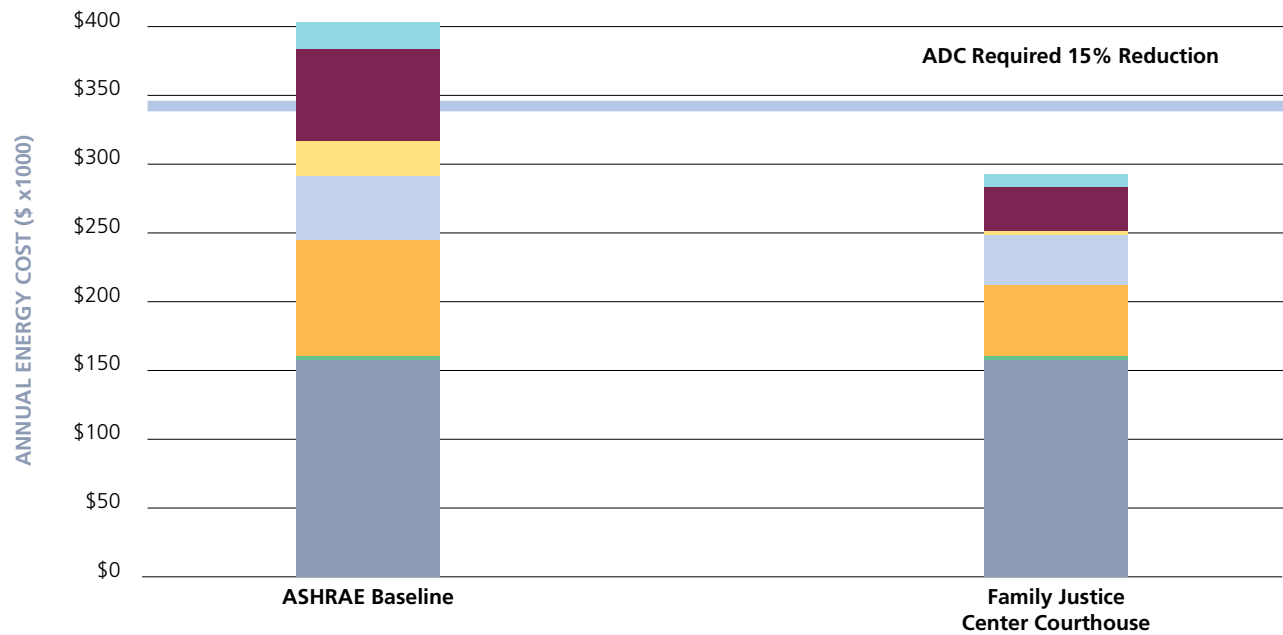
The Family Justice Center Courthouse integrates high-performance design strategies, and is registered with the U.S. Green Building Council's LEED® green building program. Innovative sustainable solutions include:

-  **SUSTAINABLY SOURCED MATERIAL** All concrete framework and interior wood finishes use wood certified by the Forest by the Forest Stewardship Council. This ensures the sustainable logging of trees and the use of plantation grown wood.
-  **DAYLIGHT AND VIEWS** Strategic placement of glass in public spaces filters direct sunlight and takes advantage of daylight and views.
-  **REGIONAL MATERIAL** The precast panel concrete mixture contains local aggregates.
-  **GREEN BALCONIES** Roof gardens mitigate the building temperature, increase the lifespan of the roof, create new wildlife habitat, and mitigate stormwater runoff volume.
-  **SUSTAINABLE LANDSCAPE** A palette of local plant species minimizes the need for maintenance, irrigation, or mowing, and creates a natural habitat for local wildlife.
-  **STORMWATER DESIGN** Bioswales, vegetated strips, and stormwater planters will treat runoff and remove total suspended solids.
-  **HIGH-PERFORMANCE BUILDING ENVELOPE** The building orientation, ventilation, and envelope design work together to balance heat gain.



2 ENERGY EFFICIENCY

The new Family Justice Center Courthouse achieved a 29% reduction in energy cost compared to the LEEDv3 – ASHRAE 90.1 2007 baseline, resulting in 9 EAc1 points and an Energy Use Index (EUI) of 38. Here is the energy breakdown:



- LEGEND**
- Plug Loads
 - Boilers
 - Fans
 - Pumps and CT's
 - Lighting
 - Chillers
 - Domestic Hot Water

The energy savings are mostly attributed to the following energy conservation measures (ECM's).

A. HVAC SYSTEMS

HVAC systems throughout the building have been selected and designed to maximize energy performance. Supply air temperatures have been set at 65°F to maximize the benefits of an airside economizer, particularly in courtroom spaces, which are provided with displacement ventilation. Heat recovery systems reduce the heating demand by recovering energy from courtroom exhaust air.

In office and public circulation spaces, hydronic cooling utilizes elevated chilled water temperatures, unlike traditional systems, which allows the use of high efficiency chillers, as well as a waterside economizer to further reduce energy consumption.

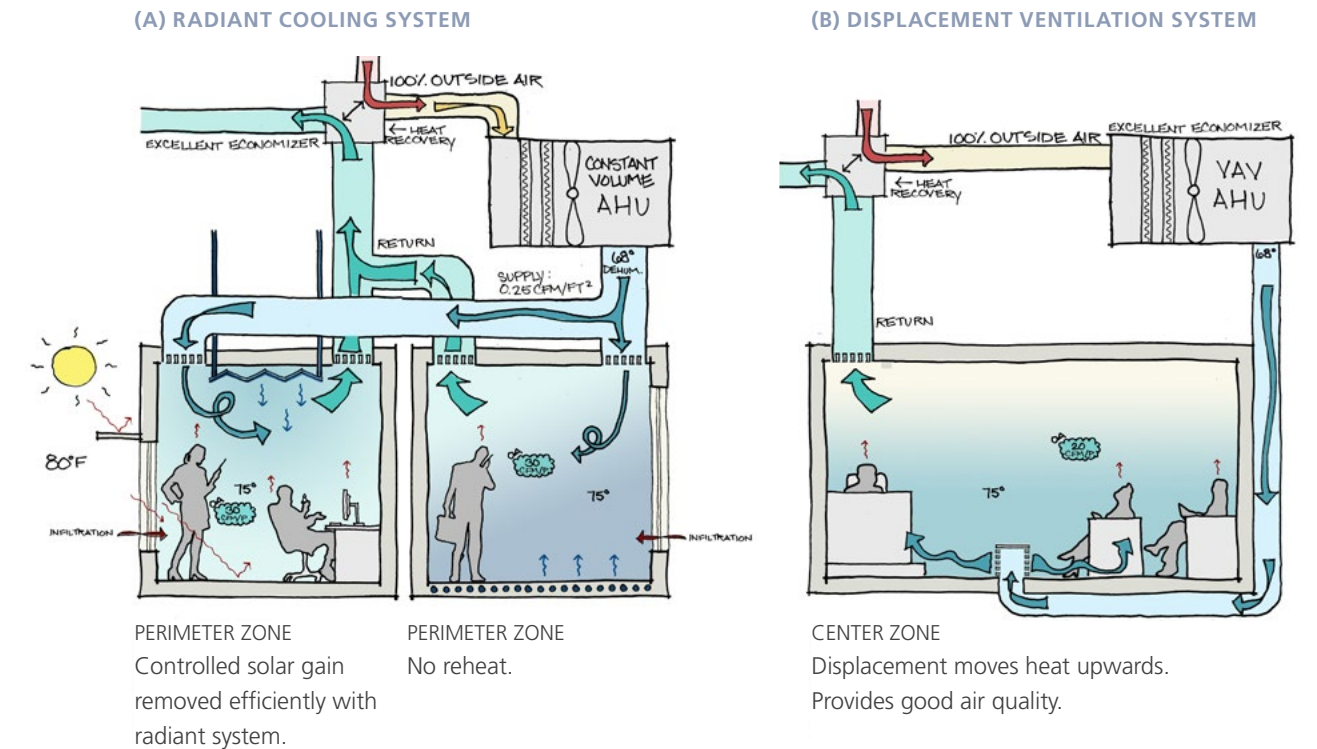
B. HYDRONIC COOLING

While traditional cooling systems control only air temperature, the hydronic systems used at the Family Justice Center Courthouse are also capable of affecting radiant temperature within the occupied spaces. Occupant thermal

comfort, which is typically quantified as the average of air and radiant temperatures, is provided using systems where both are controlled, achieving a more comfortable space. Chilled beams in office spaces provide radiant cooling, while radiant floor slabs in the public circulation areas provide both heating and cooling (A).

C. VENTILATION RATES

All ventilation systems provide 100% outside air with ventilation rates far in excess of code requirements. These systems more effectively remove pollutants from spaces and eliminate the risk of distributing contaminants from one part of the building to another. This results in a space that has exceptional air quality and low CO₂ levels compared to recirculating systems. In courtrooms, displacement ventilation introduces supply air at low levels, while exhausting the air supply at high levels to further improve air quality in the breathing zone. Contaminants introduced by occupants, such as CO₂, are quickly displaced out of the breathing zone (B).



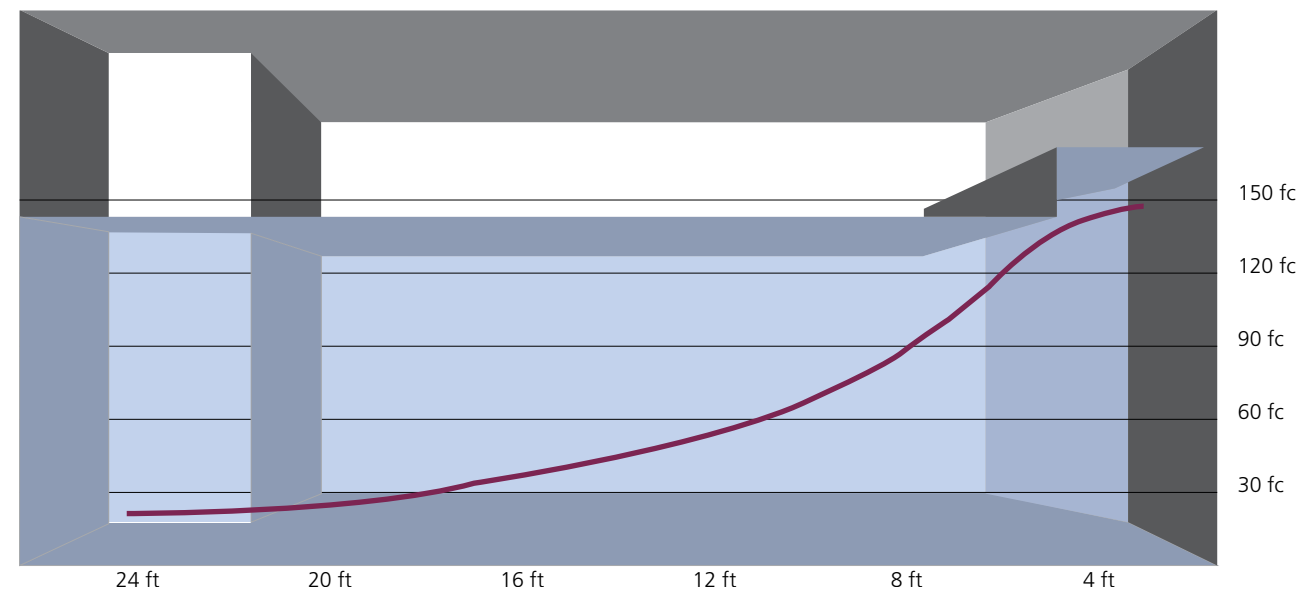
D. LIGHTING DESIGN AND CONTROLS

Lighting systems throughout the project have been designed to reduce the connected lighting load by 20% from a code compliant design. This strategy provides significant ongoing energy savings throughout the life of the building. Further reductions in lighting energy use have been achieved through

the use of daylight and occupancy controls. Occupancy sensors ensure lights are shut off when they are not needed by occupants, while daylight sensors detect available daylight and reduce the lighting power to maintain maximum lighting levels.

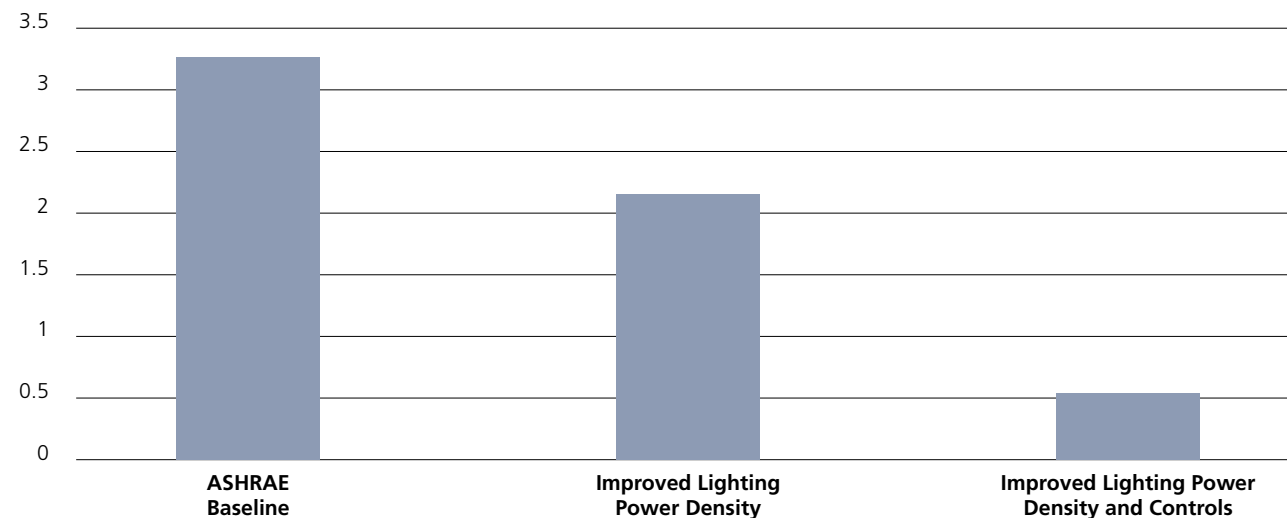
USABLE DAYLIGHT LEVELS

The graph below shows the annual average levels of usable daylight across the floor plate for the Judges' Chambers. For this analysis, usable daylight is defined as illuminance levels between 30 and 600 foot candles (fc). Blinds are lowered when peak illuminance exceeds 600 fc.



ENERGY USE INTENSITY (kWh/FT³)

The Judges' Chambers achieved an 83% reduction in lighting energy use intensity through reduction in Lighting Power Density (LPD) and the use of occupant sensors and daylight dimming.



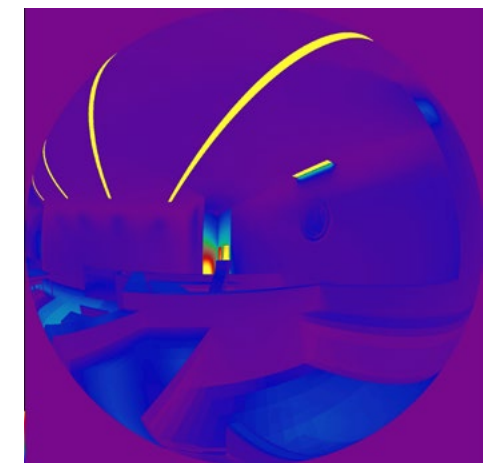
E. DAYLIGHTING IN COURTROOMS

Modern courtrooms are typically isolated from the outside with no access to daylight or views. Providing windows in courtrooms would introduce a significant source of glare for occupants. In the Family Justice Center Courthouse, daylight has been introduced into the space as a wall wash behind

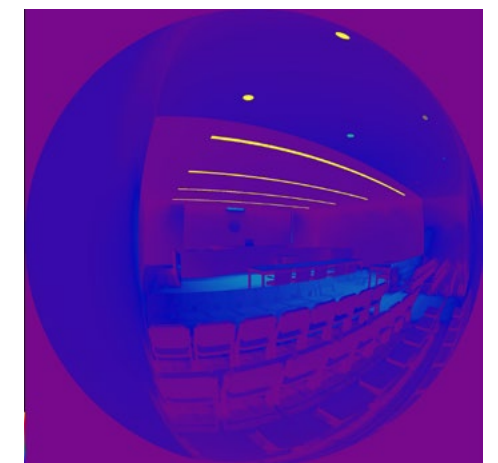
the bench, eliminating any glare. During the day, the light level on this wall varies in response to the movement of the sun and ambient weather and sky conditions (see below models). This allows occupants to maintain a connection with the outdoors without compromising visual comfort.



2:00 PM



5:00 PM

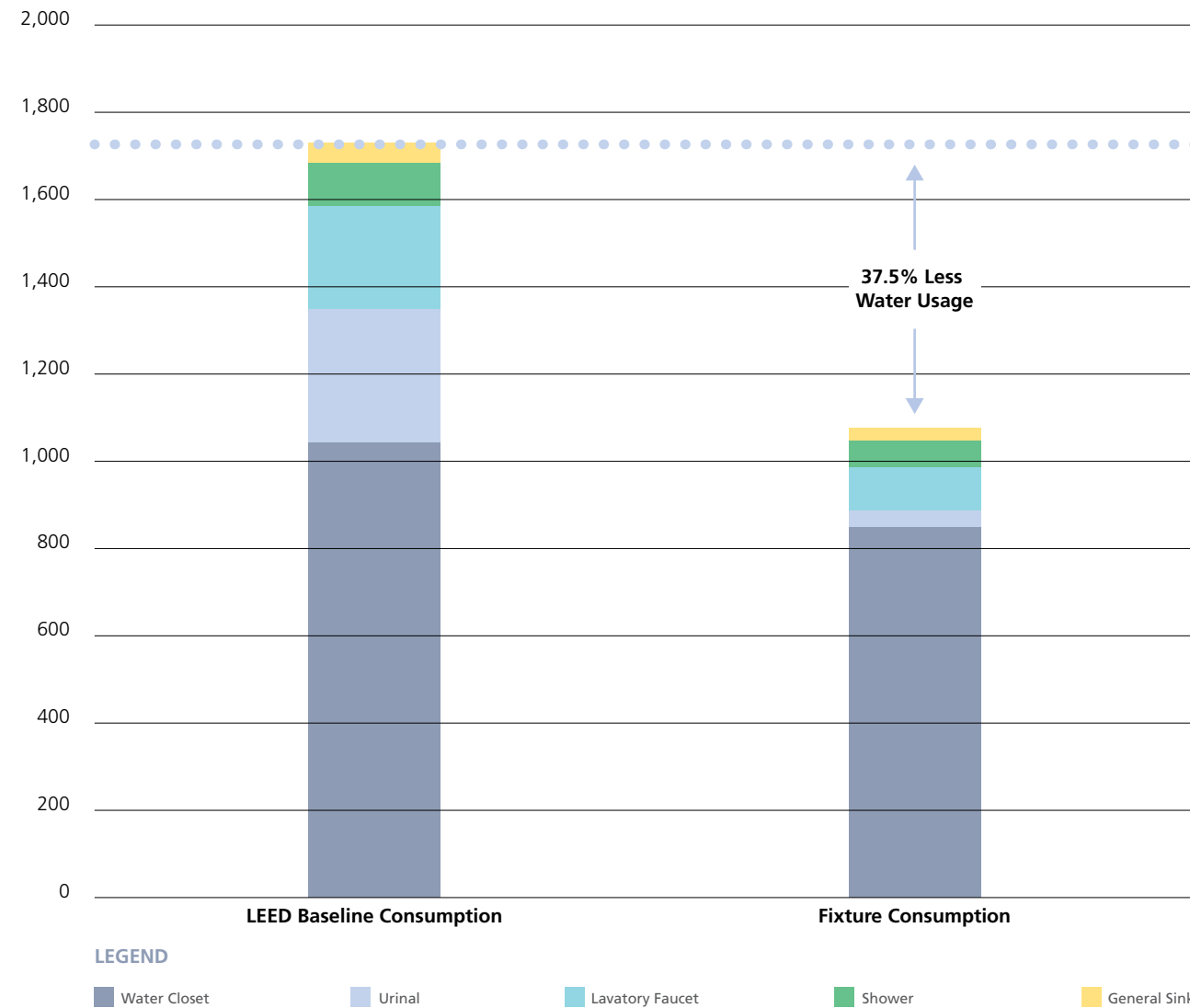


3 WATER EFFICIENCY

The use of high-efficiency plumbing features has provided a 37.5% reduction in indoor potable water usage, as illustrated in the chart below. This involves the use of low-flow faucets and showers, and high-efficiency toilets.

ANNUAL WATER CONSUMPTION (KGal/Yr)

Water Usage – Reduction against LEED® Benchmark



4 MEASUREMENT AND VERIFICATION

A Measurement and Verification (M&V) evaluation of the Family Justice Center Courthouse has been performed, and is currently being reviewed by the U.S. Green Building Council.

The diagram below illustrates processes used by engineers on the Family Justice Center to perform M&V.

