TOWN OF PORTOLA VALLEY

NEW TOWN CENTER GREEN LIST

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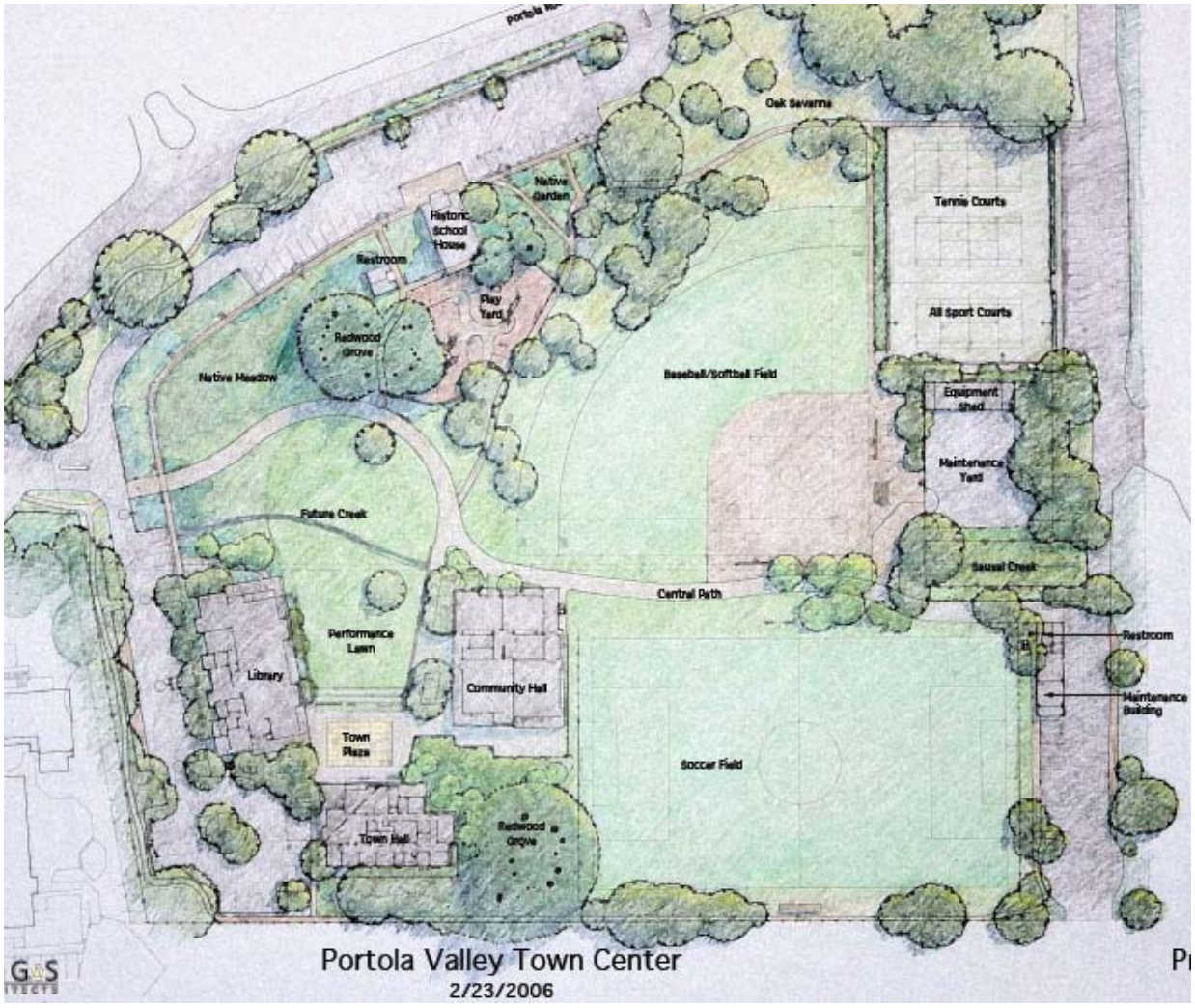
A List of the Green Things the Town of Portola Valley has done in building our new Town Center



Introduction

A few years ago, the Town of Portola Valley set out to build a new Town Center Complex that was more functional, and built in a sustainable and environmentally sensitive way. In addition we explicitly built this Town Center to address the seismic safety issues our site faces since it is bisected by the San Andreas Fault. A building which is damaged in an earthquake and has to be rebuilt is not a sustainable building. Consequently, we consider many of the seismic and fire safety measures in the new buildings contribute to their sustainability and include them here.

This list is meant to summarize the highlights of our sustainable approach.

TEAM

1. Design Team: We chose a local, leading architectural design team with a reputation for building great green projects (Siegel & Strain, partnered with Goring/Straja). They used supporting team members from leading local engineering, mechanical and landscape firms, frequently with worldwide reputations.

2. Contractors: We selected a Construction Management firm with an equally good reputation for building green projects, and with a track record of careful cost controls. (TBI Construction Management) We also used a multi-prime contracting process involving some 30+ separate bid packages which allowed us to select the best subcontractors at each stage.

3. Public: We involved the public in an initial Design Charrette where we solicited ideas and involvement from our citizens. Furthermore, every major decision was made after public hearings, and the project was run by a committee of citizens, volunteer committee members, elected officials, town staff members and consultants, and the designers and construction managers.

SITE PREPARATION

4. Site Use During Construction: We partitioned the site to keep many existing town center functions going during the construction phases. This included playing field use, playground use, Town Meetings and the Town Administrative functions.

5. Dismantling: We avoided simply demolishing the existing, abandoned structures on the site. Rather, we carefully dismantled these old buildings and recovered roughly 90% of their materials for reuse in the new buildings. Recovered wood materials will be discussed below. Concrete and masonry materials were ground up on site and stock-piled for use as base rock during the following construction phase. By not offhauling debris, we saved 11.6 Tons of CO_2. Only obsolete mechanical equipment, built-in furnishings and a small percentage of the old construction materials were discarded and much of that was recycled.

OVERALL BUILDINGS (FEATURES SHARED BY ALL OF OUR BUILDINGS)

6. FSC-1 Structural Wood: All the buildings in the complex are constructed of certified, sustainably harvested structural wood, typical Douglas Fir. This wood is harvested from forests that are certified to be sustainably managed (and therefore given the FSC certification). It costs more and was particularly difficult to get in our case because of the high structural standards we had to meet due to earthquake engineering. In addition to saving old growth forests, Larry Strain has estimated that we saved 32 Tons of CO2 by using this class of wood.

7. Recycled Structural Beams: The external wood beams around the sun shades are recovered from older buildings in the Bay Area and still show some small imperfections from their earlier use.

8. Concrete: All of the concrete in the building foundations and walls, and throughout the site, incorporates slag recovered from blast furnace waste and fly ash recovered from power plant smoke stacks. The slag and fly ash substantially replace the Portland cement in conventional concrete and results in a ~50% reduction in greenhouse gas emissions, compared to normal concrete. Larry Strain has calculated that our use of this slag concrete reduced our carbon footprint by 124 Tons of CO2. This slag concrete is also about 200% stronger and more water resistant compared to conventional concrete, and is slightly more expensive.

9. Exterior Siding: All of the buildings use locally sourced, recycled, old-growth redwood exterior siding. This wood is salvaged from old redwood water tanks and salvaged logs that were re-milled locally.

10. Exterior Sun Shades: Most of buildings have exterior sun shades made from reclaimed Alaskan Yellow Cedar. These shades cut down on excess solar heating in the summer but allow winter sun to shine through.

11. Solar Power: The Library and Community Hall have a total of ~70 kilowatts of Photovoltaic Panels mounted on their roofs. This should provide nearly all of the town center's electrical power needs for the next century.

12. Operable Windows: All of the buildings have manually operable, double glazed windows to allow through ventilation and lessen dependency on air conditioning. The gap between the panes is filled with argon gas to improve its insulation value. In addition the window sash and frames are constructed from FSC certified Douglas Fir.

13. Low Water Use Restrooms: The bathrooms in each of the buildings feature low water use fixtures with 0.9/1.6 gallon dual flush valves, and waterless urinals. The tile on the walls and partition materials are from recycled content.

14. Salvaged Wood Used As Window Trim: Some of the window trim in the buildings was actually made from recovered crate material found on site. These crates had been

delivered to the site enclosing the metal roofing panels, and would have been discarded but instead were salvaged and reused on site by a subcontractor.

15. Interior Ceiling Fans: In the large spaces of the buildings there are a number of ceiling fans that further improve air movement and lessen the need for air conditioning.

16. Interior Wood Paneled Walls: A number of the main interior walls in the larger public spaces in each building are paneled with wood recycled from our old buildings, which includes the old nail holes.

17. Tree Trunk Columns: In the Community Hall and Library, the structural design of the buildings necessitate free-standing columns to support the overhead beams. For seismic strength they had to be steel. We used tree trunks from trees felled on site to clad those steel columns, adding protection, some lateral strength and a more rustic appearance.

18. Interior Latticed Ceilings: In many of the large spaces, we are using a wood lattice design, backed by an acoustic material. The wood lattice is also created from re-milled strips of roofing lumber recovered from dismantling the old buildings.

19. Interior Columns: In the Library and Community Hall, freestanding columns in the large spaces are clad with the trunks of hardwood trees that were felled on the site to make room for the baseball field.

20. Interior Wall Insulation: The buildings throughout are insulated with recycled cellulose and recycled blue jeans waste. You can see recognizable bits of fabric in it that clearly came from pants.

21. Interior Countertops: We are using recycled glue-lam beams from the old MUR building, that have been sliced in half, as countertops in the Town Hall and Library.

22. Interior Cabinetry Details: We are using recycled branches and small tree trunks from vegetation cleared on the site during construction as cabinetry trim in built-in cabinets in the Library and Town Hall.

23. Interior Floor Finishes: In many cases the floors are stained concrete and use a non-toxic water-based stain and sealer. Carpeted floors use an Interface carpet tile with a high recycled content and that are installed with a “peel and stick” non-toxic adhesive.

24. Heating, Ventilation and Air Conditioning: Through the use of high levels of insulation, thermal mass and exterior shading, we have been able to reduce the size of the HVAC systems we need to residential scale units, increasing efficiency and reducing costs. Two of the buildings use radiant floors for heating and all the buildings use highly efficient, small scale compressor cooling units to pre-cool the ventilation air and night time ventilation to provide cooling. Energy modeling predict that the buildings will exceed Title 24 requirements by more than 65%.

25. Non-toxic, Low VOC materials: Materials were selected throughout the project for their low VOC (Volatile Organic Compounds) and non toxic attributes including zero VOC paints sealants and formaldehyde free adhesives.

26. Recycling of Construction Materials: Throughout the construction process, every effort was made by TBI and the various sub-contractors to recycle all construction waste including waste wood, packing materials, and other construction byproducts.

LIBRARY (SPECIFIC ADDITIONAL FEATURES OF THE LIBRARY)

27. Thermal Mass: The library design incorporates two large, thick, concrete-walled alcoves which act as thermal masses that hold the days' heat at night and the night's cool during the day, thereby reducing HVAC and energy needs.

28. Dashboard: The library houses a dashboard that graphically displays how much energy and water we are consuming on the Town Center site in real-time. This system is coupled to a roof mounted digital weather station and to data sources available on the Internet, including a website that tracks the Town's generation of solar energy from individual homes. The dashboard allows fine-tuning of our town center resource use, and serves as an educational tool for library visitors.

29. Seismograph: Separately, a citizen-built seismograph will also use the dashboard display area to show a real-time seismic trace.

30. Furnishings: The furnishings in the library, including bookshelves, chairs and tables are made from FSC, sustainably harvested hardwoods such as cherry.

COMMUNITY HALL (SPECIFIC ADDITIONAL FEATURES OF THE C.H.)

31. Eucalyptus Flooring: The sprung floor of the main room in the community hall is made from eucalyptus wood from trees that were felled in the local area last year in a fire management effort. They were milled locally and represent the first use of local eucalyptus wood as flooring in the area. This allows a productive use of large local eucalyptus trees that otherwise currently represent a significant fire hazard.

32. Exterior Doors: The Community Hall is designed to allow the doors to be full opened to the adjoining plaza and permit large gatherings to flow freely between these inside and outside public spaces.

TOWN HALL (SPECIFIC ADDITIONAL FEATURES OF THE TOWN HALL)

33. Engineering: All of the new buildings are being built to the highest structural standards and the latest building codes. The Town Hall is being engineered to an extra strong

"immediate use" standard to allow its use immediately after a major disaster as an Emergency Operations Center (EOC).

34. Light Well: A light well is used in the Town Hall to allow more natural light into interior spaces.

SITE

35. Paths and Service Roads: These are underlain, substantially constructed from, or surfaced using base rock recovered from the old buildings on the site. Most of the concrete, concrete block and paving in the old buildings was recycled in this way.

36. Reduced Paved Area: Compared to the old Town Center Site, the new Plan reduces both the amount of building area and the amount of impervious pavement by roughly 20% while maintaining virtually all of the functions and uses on the site. Where all-weather paths and service roads are required, they use porous surface materials. The Town has also negotiated reciprocal parking arrangements with the adjoining church allowing each party to use the other's parking in overflow situations.

37. Site Wood: Throughout the site we are using reclaimed redwood or other woods. Examples include all of the picnic tables, the grandstands and trim wood around the playing fields, and various other fence or retaining wall locations.

38. Native Plant Garden: A portion of the site has been designated as a demonstration Native Plant Garden to provide examples of local native plants to citizens.

39. Cisterns: Rainwater is planned to be collected in a cistern during the winter months and used to water the Performance Lawn in the center of the site during the summer months. We are hoping to use the abandoned creek culvert as a preinstalled 44,000 gallon cistern.

40. Local Tree and Plant Variants: Wherever possible, the Town's Conservation Committee is providing tree variants for replanting that are descended from local trees (rather than non-local imports).

41. Tree Preservation: Wherever possible, we have tried to preserve existing trees from the former site. In one case we attempted to transplant a pair of intertwined oaks to another area on the site (partly successful so far). When a tree had to be felled, we sought to use its trunk in the buildings or in streambed stabilization.

42. Low Water Use Plantings: In low traffic areas on the site, we are using native grasses to minimize water use and the need for irrigation. In general, irrigation is being used minimally to establish plants and will not be relied on for long term irrigation.

43. Electric Vehicle Provisioning: Four parking places are provided with electrical outlets to allow electric cars to be plugged in and recharged.

44. Emergency Drinking Water and Supplies: We are stockpiling 500 gallons of bottled water for use in an emergency and housing a supply of emergency blankets, clothing and equipment. We are also installing a 2500 gallon tank in line with the water supply to provide an additional source of stockpiled drinking water in an emergency.

45. Emergency Power Generator: We are also making room on the site for an emergency power generator that kicks in to power our EOC in a power failure.

46. Fault Bypass for Water Reconnection After an Earthquake: The incoming water line necessarily crosses the fault zone. We have installed fire hydrants at both sides of the fault zone and are stockpiling a flexible hose to restore flow should the main line be severed in an earthquake.

CREEK

47. Daylighting: Three hundred feet of seasonal creek that currently flows in a culvert under the site is being daylighted and restored to its natural state, including the use of native riparian plants and high water flow retardation during storm conditions.

CERTIFICATION

48. LEED. The U.S. Green Building Council has established standards for evaluating how "green" a project is, including ratings of Certified, Silver, Gold and Platinum. It uses a points system to determine the ratings. Our site does not qualify for 8 different point categories that are available only to urban buildings and sites, but we are getting the points in almost every other category that is possible for our rural site. The Town has targeted a Platinum rating and appears to be reaching this goal. We are not aware of any full Town Center complex in the nation that has attained a Platinum rating as of this date.