Introduction

Pringle Creek Community, located in Salem, Oregon, integrates restoration, landscape preservation, and new urbanist planning principles with green design. The result: a unique relationship between community living and the natural environment.

The Pringle Creek Community is a hub of innovative approaches to living and community building. Recently given the Green Land Development of the Year award by the National Association of Home Builders, Pringle Creek may be the most sustainable community currently under construction in the nation. Of the 32 acres it occupies, land formerly used by the Fairview Training Center, 12 have been set aside to create the village center, community gardens, and small parks. Additionally, all of the 179 homes planned at Pringle Creek will be required to meet the LEED-H Gold Level certification at a minimum, one of the highest levels of green building currently used by the US Green Building Council.

Since its inception, Pringle Creek has been committed to eco-friendly building practices, efficient energy and resource systems, and a strong respect for the natural environment. Every decision made during the development of Pringle Creek, from how it was planned to how it was built, has been informed by the principles of sustainability.

This case study looks at four particular areas of the development:

1. Natural Assets & Land Uses
2. Community: Lively Resources & Diverse Households
3. Infrastructure: Stormwater & Energy
4. Built Form: The Cottage House
Creating a Community

The planning process for the Pringle Creek Community was an open, collaborative effort between the design team and community members.

A series of open houses and charettes allowed the design team at Pringle Creek Community to work directly with community members to generate the initial design concept. 13 sustainability principles guided the design from start to finish:

**Principles for Land Use:**
- Encourage Economic and Social Diversity
- Create a Village Center
- Reuse and Retrofit existing buildings
- Create Local Employment
- Build Efficiencies by Building Green

**Principles for Ecological Systems:**
- Respect the Landscape
- Eliminate Impact to the Regional Watershed
- Integrate New Development into the Existing Ecology
- Close the Cycle of Energy and Material Flows

**Principles for Transportation & Movement:**
- Use Green Corridors for People and Living Things
- Keep Transit Close at Hand
- Use an Interconnected Street System
- Walk Every Day

Collaborative activities continued with a series of community gatherings throughout the planning process and the construction of the infrastructure. All of the events hosted at the Pringle Creek Community centered around stewardship, craft, culture, and community, allowing bonds to form among neighbors and future residents even as the project developed.
Natural Assets

The natural assets inherent to the site were the first elements to inform the master plan. Pringle Creek, the Community’s namesake, provided the initial structure on which all planning decisions were based.

The initial design goal, maintained throughout the development process, was to utilize the natural assets on the site to form the framework for land use and transportation systems. For example, the open spaces that protect the riparian zone of Pringle Creek now also provide public amenities including multi-mode paths.

Inventory of Assets

A key objective during the development of the Pringle Creek Community was to celebrate the natural flow of water on the site. During the project, natural water flows to the creek were restored, and development was planned to preserve these water paths.

Topography, views, and solar access afforded by different areas on the site were key elements in determining the framework. Courtyards were planned in areas with views to the Cascade Mountains, and homes were designed to utilize the topography of the surrounding landscape. The “Tallhouse” homes, for example, were designed specifically to integrate into their sloped, wooded surroundings.

80% of the existing stands of mature trees at the site have been maintained and subsequently used to create the structure for small parks within the development. The streets will become the second growth of the urban forest as a variety of street trees were chosen for delineating individual blocks.

The street system and block layout at Pringle Creek were then formed by integrating the existing open space network into the planning, connecting the creek to the Village Center via community open space.
Land Uses
A network of green streets, pedestrian walks and bike paths connect distinct neighborhoods within Pringle Creek Community. Each neighborhood possesses its distinct character, while connecting to community common areas like the Village Center.

Existing Buildings
Preserved and rehabilitated existing buildings on the site form the heart of community and commercial activity at Pringle Creek. These existing buildings, accompanied by natural landscape features and an extensive open space network, helped guide the layout of streets, alleys, and paths.

Land Use Strategies
The connected network of green streets provides a diverse variety of sizes including: alleys, woonersf, neighborhood, and main streets. Pringle Creek bike paths and sidewalk systems are extensive, in order to encourage walking and bicycling throughout the community.

The unique nature of the site and street layout at Pringle Creek provided numerous opportunities for distinct design. Because sustainability and community remained at the forefront of the planning process, lot sizes were minimized to encourage use of community open space, and all homes were limited to one car garages. Additionally, community amenities, such as a satellite post station, were located in the Village Center in order to encourage the use of community areas by Pringle Creek residents.
A Lively Community

“Humankind has not woven the web of life. We are but one thread within it. Whatever we do to the web, we do to ourselves. All things are bound together. All things connect.” - Chief Seattle

The Pringle Creek Community employs a variety of resources to encourage community interaction and outreach to surrounding communities.

Sustainable Living Center

The Sustainable Living Center, a non-profit organization created by the Pringle Creek Community, provides patrons with an education center for sustainable living. Using hands-on learning workshops and classes, along with social and educational events that facilitate community interaction, the Sustainable Living Center provides individuals with the tools necessary to lead happier, healthier, and more sustainable lives.

Community Gardens

Community and orchards gardens, located throughout the Pringle Creek Community site, encourage residents to work together to produce food and flowers without the use of harmful chemicals. Following the principles of sustainability that informed the planning process for the community, water conservation and composting techniques are also key practices at the gardens. Gardeners also have the opportunity to donate a portion of the produce to the Marion/Polk Food Share.

Outreach Programs

The Pringle Creek Community exists within a larger community context, and one goal of the planning process was to ensure that a connection to the larger Salem area was established and maintained. In addition to involvement in activities such as the Marion/Polk Food Share program, this has been accomplished through various outreach programs planned at Pringle Creek through the Sustainable Living Center.
A Community of Diverse Housing Types

No two households are exactly the same. Accordingly, housing options at Pringle Creek employ a diverse range of types, sizes, and costs.

While each of the homes at Pringle Creek shares the characteristics of simplicity and sustainability, the structures themselves have remained diverse. The design intent for the homes at Pringle Creek was to establish a mix of housing types and sizes within each block in order to effectively meet a range of prospective homebuying needs. Three of the six home types currently under construction are illustrated below.

**Cottage Courtyard House**

These detached homes are organized around a common courtyard, and utilize covered porches and shared central green space to encourage community building.

**Net-Zero Home**

Net-zero homes are among the largest dwellings at Pringle Creek, but offset their size by contributing enough energy to the grid as they consume.

**Rowhouse**

Rowhouses provide a higher density housing option, but still provide extensive daylight and small private yards.
Streets and Stormwater
Stormwater management, designed around a connected network of green streets, allows 90% of the rainwater at the site to permeate the ground, recharging natural aquifers.

Green Streets
Pringle Creek Community currently showcases the largest installation of porous paving and pervious concrete within a single development in the country. Traditional gray infrastructure (right) captures and conveys stormwater underground in pipes, concentrating toxins before they reach a pond or waterway. Contrastingly, green infrastructure (right) allows 90% of stormwater to infiltrate the ground, thereby allowing the microbial action of the soil to filter the stormwater as it returns to local groundwater aquifers.

By combining porous paving surfaces, rain gardens, stormwater infiltration swales, planting strips, and biofiltration verges, Pringle Creek maximizes healthy water infiltration at the site. During a typical rain event, rainfall will permeate the ground by natural filtration into a 10" drain rock base; during a large rain event, excess rain will be moved by surface conveyance into the 16" rock verge which separates the parking lot from planting strips. The rock verges, along with rain gardens at intersections, slow the flow of water to the creek.
Energy
Energy efficient design, paired with on-site solar and geothermal energy generation, makes the homes at Pringle Creek more sustainable and more cost effective.

Solar
Reducing energy use was one of the primary objectives for the Pringle Creek design team. High energy efficiency for each of the Community’s 179 dwellings was accomplished by utilizing energy efficient design and by generating energy on-site. Photovoltaic (PV) panels located on the roofs of the buildings generate electricity; panels are also used to heat water before it reaches a home’s water heater. The plan on the right reflects an analysis of the site conducted by the Oregon Department of Energy, addressing solar access and the availability of geothermal water on-site.

Geothermal
A well designated for domestic water use and irrigation, located at the Pringle Creek site, has been utilized for a GPHS (Ground Source Heat Pump System) water distribution system. The well has a 280 gallon per minute capacity for delivering water at a 59 degree temperature. The GPHS district loop (right) will extract the ambient earth temperature water from the production well pump and deliver the water to each lot via a supply piping system within the street right of way. At each lot, the water will be borrowed and circulated through a heat pump where the heat will be either extracted from the water in the heating mode, or rejected to the water in the cooling mode. After passing through the lot, the heat pump returns the water through a return piping system, where it either becomes available for irrigation use or it is returned to the aquifer via injection wells. Utilized by half the lots at Pringle Creek, the GPHS system is approximately 300% more efficient at delivering heat than a gas furnace.
Developing a home that would be durable, provide a comfortable environment for its residents, and meet a high level of sustainability standards was achieved by adhering to the following design goals:

1. Maximize the thermal performance of the exterior walls and the roof in order to minimize the heat loss of the house.
2. Efficiently plan and orient the house to minimize heat gain, reduce size, and maximize daylight and ventilation.
3. Indoor Air Quality + healthy materials: All materials were sourced for the natural characteristics and environmentally benign qualities.
4. Selecting a third party monitoring system that will self regulate to increase performance in the future.

The Cottage House Interior
While the building footprint of the Cottage House remains minimal, at 1,350 square feet, the interior of the structure makes a voluminous impression. The design team maintained an open floorplan, high ceilings, long views, and extensive daylighting in order to preserve the feeling of a large house while conserving the building footprint.

USGBC LEED-H Platinum
The sustainability features qualify the Cottage House for both LEED Platinum and Earth Advantage Platinum certification. With 103 green building “points,” it is the highest LEED rating of any home built to date and the first LEED-H Platinum home in the Northwest.
Passive Solar
Solar screens built on the south facing exposures provide shade on window exteriors in summer, and allow sunlight and solar warmth in the winter.

Windows
EnergyStar® windows with low-E glass exceed local insulation code, and protect against UV damage. The wood trim on the inside along with low-maintenance cladding on the outside, adds to style and appeal.

Exterior Surface
Durable fiber cement siding is moisture and rot resistant. Underneath, a unique Rain Screen system resists the degrading effects of air and water. Tough, long-lasting exterior finish helps the home endure for generations, and requires less maintenance over time. Exterior paint is low-VOC* and locally sourced.

Solar
Photovoltaic (PV) panels generate electricity year-round. Power generated but not used, is sold back to the utility company.

Solar Water
Panels pre-heat water before sending it to the water heater.

Layers of efficiency
Using advanced construction techniques, high-performance insulation, energy-rated roofing, windows and doors, each home is designed to keep its residents comfortable year-round while also keeping energy bills low. Many homes will have a high efficiency geothermal heat pump for heating and cooling.

Indoor Air Quality
Low-VOC* paints, sealants, adhesives and materials reduce the presence of harmful off-gases.

FSC Lumber
Exterior and interior construction-grade lumber is 100% FSC-certified**.

Foundation
Concrete mix contains 30% fly-ash, an industrial waste product. Fly-ash makes the concrete stronger and reduces CO2 emissions during the manufacturing process.

Eco-Landscaping
Native, drought-resistant plants significantly reduce the need for watering, fertilizers, and herbicides. Limited lawn and planted areas are irrigated with a drip irrigation system, which uses minimal water. Rainwater harvesting collects run-off from the roof and stores it in a cistern for landscape irrigation in dry seasons.

Porous Paths and Sidewalks
The porous nature of paths and sidewalks allow rainwater to seep back into the soil. These are part of the community-wide Green Streets system that captures, absorbs, and filters stormwater back into the aquifer instead of piping downstream into creeks and rivers.

*VOC: Volatile Organic Compounds
Toxins found in wood laminates, adhesives, paints, sealants and synthetic materials. Low-VOC products have almost no harmful off-gases.

**FSC: Forest Stewardship Council
An international non-profit organization committed to the conservation, protection and restoration of the world’s working forests.
CORE PLANNING TEAM
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Structural Engineer: Catena Consulting Engineers
Framing: Spectra Construction
Energy Consultants: Oregon Department Of Energy
Eco-landscape: Desantis Landscaping
Interiors: Jessica Helgerson Interior Design
Builder: Bilyeu Homes