Towards A Zero-Energy Community at Pringle Creek

Green Land Development of the Year
LEED-H Platinum

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LET’S BUILD A PLACE...
The story unfolds in Salem, Oregon.
Salem and the Fairview Area
The site: former Fairview Training Center
Master Planning
Creating The Framework

Collaborative Planning: Charette
and Design Workshop
Pringle Creek builds on the Fairview Principles
Why Pringle Creek?

- Pringle Creek is designed and programmed to be a world-class model of sustainable development - a living laboratory and place to celebrate innovation and community.
- Showcase Oregon’s leadership role in Sustainability
- Communicate the social, cultural, economic and environmental benefits of SD
- Connect to business, institutions with workshops, classes, forums
- Create a community that is vibrant
- Every decision has been made with these goals in mind:
Stewardship

“A community taking care of the land as a parent nurtures a child and protecting it for the good of all things.”
Community

“Embracing all of Salem and its surroundings with its diversity of inhabitants by living lightly on the land.”
Recognizing the special environmental features of the property, three major goals have guided the planning of Pringle Creek Community:

- Embrace sustainable land use principles
- Build ecological systems
- Promote smart transportation and movement principles
Principles and standards are, by intention, performance goals to be interpreted with creativity and flexibility, not specifications to be applied narrowly and precisely.
**Community Master Planning Principles**

**LAND USE**
1. Encourage Economic and Social Diversity
2. Create a Village Center
3. Reuse and Retrofit Existing Buildings and Landscapes
4. Create Local Employment
5. Build Efficiencies by Building Green
Community Master Planning Principles

ECOLOGICAL and Movement SYSTEMS
6. Respect the landscape
7. Eliminate impact to the regional watershed
8. Layer the system
9. Close the cycle of energy and material flows
10. Use green corridors for people and living things
11. Eliminate impact to the regional watershed
Residential Design
Environmentally honest, healthy, and most of all, sustainable.
Residential Planning Principles

A. A Community of Diverse Households
B. A Lively Community-based Public Domain
C. A Robust Natural Landscape
D. A Simple Architectural Vocabulary
E. Neighborly Buildings and Yards
F. Sustainable Site Planning, Design and Construction
Household Types → Dwelling Types

- Household Types
  - Larger
  - Smaller

- Dwelling Types
  - More expensive
  - Less expensive
**LIVE-WORK STUDIO (upper unit)**

**PRINCIPAL (UPPER) UNIT**
Two story, two bedroom dwelling stacked above lower unit. Longitudinal walls are shared with adjacent units allowing light and ventilation along the two short sides. Vertical stratification of private and public activities. Single parking space provided at rear of lot. Private outdoor space accessed via plunge public space with access to rear garden and parking garage.

**1500 FLOOR AREA**  **PARCEL AREA 1100**  **2 BEDROOMS**  **TOTAL UNITS 6**

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**16FT STACKED TOWNHOUSE (upper unit)**

**PRINCIPAL (UPPER) UNIT**
Three story, four bedroom dwelling stacked above wider lower unit. Longitudinal walls are shared with adjacent units allowing light and ventilation along the two short sides. Vertical stratification of private and public activities. Single parking space provided at rear of lot. Private outdoor space accessed via dining room with access to rear garden and parking garage.

**2100 FLOOR AREA**  **PARCEL AREA 1000**  **4 BEDROOMS**

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**4TH LEVEL - PRIVATE FLOOR**
"Dumbbell" organization with private (bedroom) spaces subdivided by the circulation and service functions. Each room is the full 16' width of the home and can act as a bedroom, office, library, den or study. These spaces can potentially access an outdoor terrace.

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**3RD LEVEL - PRIVATE FLOOR**
"Dumbbell" organization with private (bedroom) spaces subdivided by the circulation and service functions. Each room is the full 16' width of the home and act as a bedroom office, library, den or study.

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**ENTRY (2ND) LEVEL - PUBLIC FLOOR**
"Dumbbell" organization with public (kitchen, living, dining) spaces subdivided by the circulation and service functions. Access to the backyard is via the outdoor deck located at the rear of the dwelling.
Geothermal System Diagram
Solar Analysis & Geothermal Potential
Dwelling Types And Their Distribution

1. DETACHED TYPES
   a. Small Lot Single Family
   b. Carbon Neutral
   c. Coach Lane
   d. Cottage Courtyard
   e. Treehouse

2. ATTACHED
   a. Tandem duplex
   b. Side-by-side duplex
   c. Rowhouse
   d. Stacked townhouse

3. MIXED USE
   a. Loft Living Studios
   b. Boiler Building
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MASTER PLAN FRAMEWORK: PRINCIPAL STREETS AND SLOPES

CREEKSIDE STREET
Characterized by a diversity of house types and densities of the freestanding variety appropriate to the fragile riparian edge and creating a "creekside-picturesque" dwelling environment.

**Dwelling Types:** Small Freestanding, Tandem Duplex, Stick Tandem Duplex, Coach Lane House

SOUTH-FACING SLOPES
Primary location for house types that incorporate solar design strategies.

**Dwelling Types:** Carbon Neutral Freestanding, Cottage Courtyard Units

NORTH-FACING SLOPES
Mews area, diversity of freestanding house types closely spaced in order to create an intimate pedestrian environment.

**Dwelling Types:** Cottage Courtyard Units, Tree House, Tandem Duplex, Side-Side Duplex

FAIRVIEW SIDE STREETS
Has a diversity of house types grouped into clusters creating multi-unit freestanding buildings sharing the visual qualities of Fairview’s Crescent buildings within view.

**Dwelling Types:** Rowhouse, Stacked Townhouse, Tandem Duplex, Side-Side Duplex, Small Lot Single Family, Loft Living Studios

A STREET
“High” street into Pringle with high-density, street-oriented house types that create define a well defined street wall.

**Dwelling Types:** Rowhouse, Stacked Townhouse, Tandem Duplex, Side-Side Duplex, Small Lot Single Family, Loft Living Studios

MASTER PLAN FRAMEWORK: SPECIAL DWELLING AREAS

STRONG ROAD
Dwelling units whose scale, street-facing front doors and porches command a presence along Strong Road.

**Gateway Buildings**
Dwelling units whose scale, street-facing front doors and porches command a presence along Strong Road and the Main Street of Pringle Creek.

**“Working Village”**
An area composed of Loft Living Studios located within a “mainstreet” like streetscape.

DOUBEL-FRONTING LOTS
Require dwelling types that address both frontages equally. This is to be done using architectural elements (e.g., porches, windows, etc.) and/or dwelling type (i.e., Coach/Lime House).

COTTAGE COURTYARD DEVELOPMENTS
Are located on irregularly shaped lots throughout the Pringle Creek Community. They include shared courtyard, access courtyards, and shared parking.

VILLAGE CENTER
A mix of uses that support Pringle Creek Community goals of stewardship of the environment and bringing people together.
MASTER PLAN FRAMEWORK: Public Open Spaces

AREA PLANS

The following pages illustrate site planning principles in each of the 8 areas enumerated at right. Each site plan highlights significant dwelling types, landscape elements, shared amenities, and access requirements. Dwellings in some areas may have access to geothermal energy sources (as noted).

LEGEND

- Street Parking
- Common Area Children's Play Park
- Community Gardens
- Existing Tree
- Pathway
**AREA 1: DOUBLE FRONTING LOTS**

- **LANDSCAPE ELEMENTS**: Fences, hedges, etc., shall be set and designed to define the interface of public and private space and direct a neighborhood level to the street.
- **CORNER BUILDING**: Corner dwellings shall be set and designed to direct a neighborhood public face toward both streets.
- **FRONT DOORS & ACCESS**: Entries and porches shall be set and designed to direct a neighborhood face to the street.
- **GEOTHERMAL POTENTIAL**: Site.

**DWELLING TYPE**: Coach LANE homes

Located above garages to be accessed via a "U" street.

**COMMON AREA PARKING**: At-grade parking shall be located at rear of site via a "U" street.

**DWELLING TYPE**: Multi-story, ground oriented commercial, L-shaped single homes and rowhouse single family shall be set and designed to direct a lovely and neighborhood public face to the street.

**AREA 2: SOUTH FACING SLOPES**

- **FRONT DOORS & ACCESS**: Entries and porches shall be set and designed to direct a neighborhood public face toward both streets.
- **CORNER BUILDING**: Corner dwellings shall be set and designed to direct a neighborhood public face toward both streets.

**DWELLING TYPE**: Custom Single Family Cottage Courtyard Units

**SOLAR ACCESS & VIEWS**: All homes shall be designed to capture long views, for scope, capture solar gain and promote a private courtyard.
AREA 4: NORTH FACING SLOPES

- FRONT DOORS & ACCESS: Entries and porches shall be sited and designed to direct a neighborhood face to the street.
- LANDSCAPE ELEMENTS: Fences, hedges, etc. shall be sited and designed to delineate the interface of public and private space and direct a neighborhood face to the street.
- REGENERATED BUILDING: Capture

CORNER BUILDING: Corner dwellings shall be sited and designed to direct a neighborhood public face toward both streets.

COMMON AREA PARKING: At grade shared parking structures.

DWELLING TYPE: Compact footprint, vertically oriented 2-3 storey dwelling units.

AREA 5: WORKING VILLAGE

- LANDSCAPE ELEMENTS: Fences, hedges, etc. shall be sited and designed to define the interface of public and private space and direct a neighborhood face to the street.
- DWELLING TYPE: Medium-scale, ground oriented commercial, Self Contained Studios and townhouse types shall be sited and designed to direct a lively and neighborhood public face to the street.
- CORNER BUILDING: Corner dwellings shall be sited and designed to direct a neighborhood public face toward both streets.

REGENERATED BUILDING: Capture

Common Area Parking: At grade parking shall be located at rear of site, along slopes.
AREA 6: GREENHOUSE GARDENS

FRONT DOORS & ACCESS: Entries and
perches shall be small and designed to
direct a neighborhood face to the street.

LANDSCAPE ELEMENTS: Fences, hedges,
etc., shall be small and designed to define
the interface of public and private space
and direct a neighborhood face to the street.

COMMON AREA PARKING: At grade
parking shall be located at rear of lots,
along alleys.

*Geothermal Potential

CORNER BUILDING: Corner dwellings
shall be small and designed to direct a
neighborhood public face toward both streets.

REGENERATED BUILDING: Caption

AREA 7: SEQUOIA GROVE

COMMON AREA PARKING: At grade
parking shall be located at rear of lots,
along alleys.

FRONT DOORS & ACCESS: Entries and
perches shall be small and designed to
direct a neighborhood face to the street.

LANDSCAPE ELEMENTS: Fences, hedges,
etc., shall be small and designed to define
the interface of public and private space
and direct a neighborhood face to the street.

CORNER BUILDING: Corner dwellings
shall be small and designed to direct a
neighborhood public face toward both streets.

Dwelling Type: Mixed-use, ground
oriented commercial, small Living Studios
and Townhouse Types shall be small and
designed to direct a lively and neighborhood
public face to the street.

NEW BUILDING: Caption

CORNER BUILDING: Corner dwellings
shall be small and designed to direct a
neighborhood public face toward both streets.
Green Streets

**Green Infrastructure Condition**

- Evaporation/Transpiration: 30%
- Runoff: 10%
- Interflow: 45%
- Deep Groundwater: 15%

“When one tugs at a single thing in NATURE, he finds it attached to the rest of the world.”

**Gray Infrastructure Condition**

- Evaporation/Transpiration: 15-25%
- Runoff: 55-75%
- Interflow: 10%
- Deep Groundwater: 5%

Source: LANDFILL.UO.JCCC/CSKD
Green Streets

Surface Swale
Gravel seam next to roadway, 8 inches of crushed rock on top of 10 inches of crushed drain rock.

Eco-Grass Planting Strips
Native grasses, plants and trees between sidewalk and street are part of drainage and filtration system.

Filter Fabric
Along perimeter between rock and subgrade.

Impervious Sidewalks
4 inch porous concrete on top of recycled crushed concrete or native subgrade.
Green Streets

Porous Street Section:

- 4.5 inches of porous asphalt
- 1 inch filter layer of washed aggregate
- 10 inches of crushed drain rock
- 8 inches of angular rock on top of undisturbed native subgrade or recycled crushed concrete fill
Green Streets
Green Streets
Green Streets
Green Streets

[Images of green streets with trees and landscaping.]
Green Streets
Green Streets
Pervious Main Street at Entry
Impervious Pavement Meets Pervious Pavement
Impervious Pavement Meets Pervious Pavement
GREEN FEATURES OF COTTAGE HOME

EXTERIOR CONSTRUCTION:
1. Exterior wall and roof framing uses advanced framing techniques with engineered lumber and FSC-certified® lumber to allow more insulation and reduce the need for extensive framing lumber without compromising the structural integrity of the home.
2. High performance exterior envelope insulation at roof and walls uses a combination of formaldehyde free spun foam insulation, blown cellulose, and rigid polyiso/polyurethane insulation.
3. Foundation: 30% fly-ash concrete mix.
5. Windows: 18% window to wall area.
7. Roofing: IKO Composition. Cool Color series (reflectance of .27).
8. Metal Roofing: Locally sourced, high recycled content, Cool Color series, 50 year life.
9. Low-VOC™ paint on exterior surfaces.

*FSC: Forestry Stewardship Council
An international non-profit organization committed to the conservation protection and restoration of the world's forests.

**VOC: Volatile Organic Compounds
Materials made with Low-VOC's have almost no harmful off-gases.

INTERIOR MATERIALS:
9. Flooring: Locally sourced Madrone hardwood floors with low-VOC™ natural finish. Carpeting is 100% Wool (No-VOC)
10. No-VOC paint in the interior.
12. GreenGuard-certified Natural Quartz solid surface countertops and cabinets.

ENERGY & RESOURCE SYSTEMS:
15. Solar Water Pre-Heating: 40 tube thermomax system.
17. Compact Fluorescent Lamps (CFLs) in all lighting fixtures.
18. EnergyStar® Appliances (Kitchen, laundry, electronics)
19. Dual Flush Toilets: 1.6/0.9 gallons per flush (gpf)
20. Shower Heads: 1.6 gallons per minute (gpm).
22. Native drought tolerant plants and limited lawn irrigated with a drip irrigation system. Optional Rainwater Harvesting collects water runoff from roof and storm in cistern to irrigate landscaping in the dry season. Plantings also reduce need for herbicides.
Cottage House

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.
Cottage House

- **Energy Efficiency**
  - Small footprint
  - High performance exterior envelope
  - EnergyStar® appliances
  - Energy recovery ventilation system
  - 2050 watt solar electric array
- **Energy Footprint**: 35% that of a typical home
Demonstration of Building Materials
Cottage House

- LEED™ – H Platinum Certified
  - Maximized thermal performance
  - Efficient floorplan and orientation
  - Exceptional indoor air quality and healthy materials selection
  - Third party monitoring system for future performance
Cottage House

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Cottage House

- Environmentally Sensitive Design
  - Open floorplan
  - High ceilings
  - Long views
  - Extensive daylighting
- Environmentally Sensitive Materials
  - Concrete mix with 30% fly ash
  - EnergyStar® windows with low-E glass
  - FSC lumber
  - Locally sourced hardwood floors and cabinetry
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Tallhouse

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  - Natural Ventilation
Tallhouse

- Environmentally Sensitive Design
  - Open floorplan
  - High ceilings
  - Long views
  - Extensive daylighting
  - Natural Ventilation
Tallhouse

- Environmentally Sensitive Design
  - Ambient Daylighting in Major Spaces
  - Exterior Sunshading Reduces Unwanted Summer Heat Gain
  - Sun angles were evaluated to design overhangs that allow ideal amounts of light into the home
Tallhouse

- Environmentally Sensitive Design
  - Rainscreen sided exterior sheathed in a radiant barrier of foil-faced rigid insulation minimizes heat loss and gain.
Tallhouse
Tallhouse
Pringle Creek Community is exploring every sustainable avenue in one living laboratory: from locally grown food to working with public schools on the science of nutrition; from rainwater management to green construction; from alternative energy to zero-energy, from urban forestry to community governance.
Pringle Creek: A Living Laboratory
Pringle Creek: A Living Laboratory
Together we are defining stewardship or our culture, community, citizens through education...
“Building Sustainable Communities – Opening the Door for Partnerships”

pringlecreekcommunity.com
opsisarch.com