

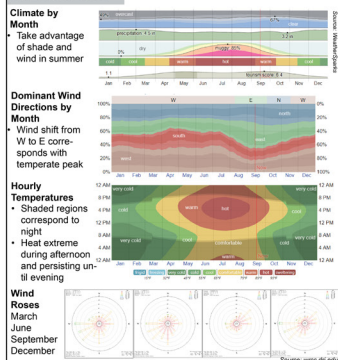
TWIN OAKS Natural Factors

Pendleton, SC

LARC 8230 Advanced Community Design
Professor Thomas Schurch, PhD, ASLA
Annie Steele and Maddie Rodgers

Sheet
2 of 2

CLIMATE



HABITAT



OPPORTUNITIES

- Add to neighborhood and community green space
- 2016 goal to add 100 acres by 2036 (Source: Anderson County Comprehensive Plan)
- Protect wildlife diversity
- Historic focus with existing antebellum house and barn
- Provide affordable housing options to the 35% of Pendleton residents who are not homeowners (Source: 2020 Census)
- Unique wind opportunities to create microclimates
- Opportunity for solar and geothermal energy
- Soil onsite does not restrict development

CONSTRAINTS

- Flood zone
- Fence row and vegetation impairs circulation
- Traffic flow in and out of site post-occupancy
- Existing vegetation and wildlife

CRITICAL ISSUES

- Water quality impact
- Natural spring
- Headwater to Town Creek and Lake Hartwell watershed
- Traffic circulation
- Poor visibility entering Cherry St and Calhoun Blvd
- Cultural impact
- How will development fit within Pendleton?

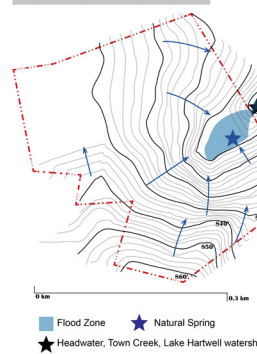
EXISTING

- Wide horizontal and vertical views
- Wide horizontal views
- Narrow horizontal views
- Shortened views
- Focal point

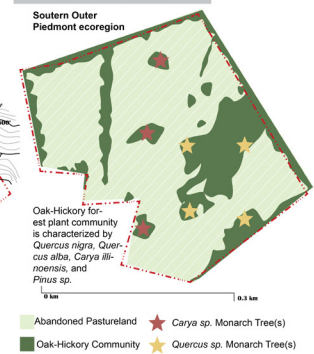
SITE DATA

- Area: 26.47 acres
- Zoning: Agricultural Forest
- Soil - Predominant: CnB-Cecil
- Typical Profile:
 - 0 - 6" sandy loam
 - 6 - 53" clay
 - 53-79" loam
- Cecil is suitable for building development, forest and pasture use.

HYDROGRAPHY



VEGETATION



SITE PHOTOS



The site is an beautiful example of iconic upstate scenery, depicting rolling hills of historic farmland turning wild without intervention.

TWIN OAKS

LARC 8230 Community Design

Pendleton, SC

Annie Steele

SITE INFORMATION

- 26.47 acres
- Suitable for building, forest, and pasture

LARGE LOTS

- 16 lots
- Sizes: 0.98 - 1.12 acres
- Prioritizes private space

HOUSING

- Southern vernacular architecture
- Neutral exterior colors

Main House

- Two porches on three sides
- Minimum two entrances
- South facing kitchen
- 2 beds/2 bath
- Unattached two car garage
- Patho included

Accessory Dwelling Units

- Single story building
- 450 sq. ft.
- Separate parking from main house

STREETS

- 9' wide street parking on interior
- Side parking for events: 19 spaces
- 2 way streets
- 2% cross slope towards interior

TRAFFIC CALMING

- Narrowed roadway with curbs
- Texture change at bends
- Raised crosswalk at intersection

PEDESTRIANS

- Shared road with motor vehicles
- Added 5' pervious path through site
- Bridges required for crossing over swales
- Clonneted walkway over floodzone
- Bicyclists share road with vehicles
- Signage warning of children king

ENTRANCES

- Cherry Street Entrance
- Traffic island with ornamental vegetation
- Signage for Twin Oaks
- Change in paving from Cherry St
- Historic barn remodeled for markets

Calhoun Blvd. Entrances

- Signage for Twin Oaks
- Change in paving from Calhoun Blvd

GEOTHERMAL ENERGY

- 1 well equivalent to 3 ton AC Unit
- Estimated 2 wells per house and 1 per ADU
- Require \$5 total wells
- Indoor components are stored in garage
- Underground pipe placed away from trees
- Average installation cost of 1 well: \$15,000
- Between \$30,000 to \$45,000 per lot
- Expected 30-70% reduction in heating costs
- Expected 30-50% reduction in cooling costs
- Life expectancy of indoor parts: 25 years
- Life expectancy of underground pipes: 50 years

SOLAR ENERGY

- Houses oriented N-S for max winter sun
- Plant deciduous shade trees over ADUs
- Solar PVC panels installed on 3 facing roof
- Panels pitched 35 deg for max efficiency
- Standard panel is 5 x 3
- Standard panel produces 250 W
- Avg life span of PVC panel: 25 years

STORMWATER

- Follow naturally occurring site drainage
- Midline of bioswales noted
- Low mow upkeep on common green space
- Riparian planting in and along bioswales
- Add curvatures and length to bioswales
- Raingardens for each house and ADU
- Gray water filtration area on each lot
- Incentives for residents to install rain barrels
- Permeable driveways

CONSERVATION

- Preserve Oak-Hickory community
- Trees added along neighborhood border
- Monarch trees remain in common areas
- No pesticides used on common land
- Private tree removal needs approval
- Non-native or naturalized species prohibited
- No outdoor cats permitted

PERMACULTURE

- Understand community's edibility
- Edible plants including but not limited to:
 - Edible Fig, 'Ficus carica'
 - Pringle's Quince, 'Acacia sellowiana'
 - Paw Paw, 'Asimina triloba'
 - Rabbiteye Blueberry, 'Vaccinium virgatum'
 - Reach and apple varieties
 - Herbs, such as, rosemary, thyme, and fennel

EVENTS

- Types of Markets
- Common edibles for community profit
- Private groups picking common edibles
- Private edibles (gardens) for private profit
- Restored barn moved to Cherry to host
- Moving shared interior space provides event space
- Overflow parking for events along road

AMENITIES

- Street pickup for trash and recycling
- Recycling center adjacent to neighborhood for large items
- Cable to elementary school
- Added bus stop along Cherry St
- Walking paths to Sifton Dr and E Main St

OPPORTUNITIES

- Ample land for food production
- Community activities related to edible landscape
- Education outreach to elementary school
- Outdoor event space
- Preserve Pendleton aesthetic

CONSTRAINTS

- Existing vegetation dictate layout
- Limit burden on existing streets
- High upfront cost to building
- Period before trees and plants produce
- Limit earth disturbance for soil health

TWIN OAKS LARC 8230

Community Design
Professor Tom Schurch

Pendleton, SC
Annie Steele

CLUSTER HOUSING

- 14 townhomes
- 2 bed / 2 bath / 2 stories
- Prioritizes common open space
- Southern vernacular architecture
- Neutral exterior colors
- Garage access direct from street
- House fronts face common space
- Each townhome has 400 s.f. courtyard

STREETS

- 27' width
- 9' wide street parking on interior
- 2 way streets
- Intermittent paving changes to calm traffic
- Higher frequency paving at intersections
- Raised crosswalks at intersections
- Stormwater details provided in Fig. 1

PEDESTRIANS

- Shared road with motor vehicles
- 6' pervious path through site
- Bridges required for crossing over swales
- Elevated walkway over floodzone
- Bicyclists share road with vehicles
- Signage warning of children xing

THRESHOLDS

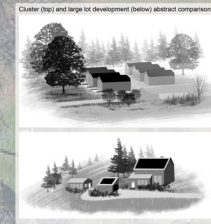
- Cherry Road entrance marked by solar array
- Plantings frame entrance but preserve views
- Bus stop under solar array
- Bus entrance/exit similar plantings
- Solar array entrance shown in Fig. 2
- Paving change at all entrances

GEOTHERMAL ENERGY

- 1 well equivalent to 3 ton AC Unit
- Estimated 2 wells per house
- Require 88 total wells
- Underground pipe placed away from trees
- Average installation cost of 1 well: \$15,000
- Per townhome: \$30,000 upfront cost
- Expected 30-70% reduction in heating costs
- Expected 30-50% reduction in cooling costs
- Life expectancy of indoor mechanical: 25 years
- Life expectancy of underground pipes: 50 years
- Geothermal well placement shown

MASTER PLANTING PLAN

- Supports existing hickory-oak ecosystem
- Suggested trees including but not limited to:
 - *Acer* sp. (*A. rubrum*, *A. saccharum*, etc.)
 - *Carya* sp. (*C. alcinensis*, *C. glabra*, etc.)
 - *Quercus* sp. (*Q. alba*, *Q. michauxii*, etc.)
- Suggested shrubs including but not limited to:
 - *Amelanchier* sp. / Serviceberry
 - *Galageus crux-galli* / Cockspur Hawthorn
 - *Kalmia latifolia* / Mountain Laurel
 - *Vaccinium* sp. / Blueberry



Downtown Pendleton 0.6 miles

E MAIN ST

CHEERY ST

Pendleton Elementary 0.4 miles

Public Works Dept. Recycling and Solid Waste 0.1 miles

STORMWATER

- Follow naturally occurring site drainage
- Low mow upkeep on common green space
- Riparian planting in and along bioswales
- Permeable driveways



CONSERVATION

- Preserve Oak-Hickory community
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AMENITIES

- Street pickup for trash and recycling
- Recycling center adjacent to neighborhood for large items
- Close to elementary school
- Added bus stop along Cherry St
- Walking paths throughout neighborhood

SOLAR ENERGY

- Solar PVC panels installed on SW facing structure
- Panels pitched 35 deg for max efficiency
- Standard panel is 5'x3'
- Standard panel produces 250 W
- For 8 hours one panel produces 2,000 WH
- Average home consumption 6 kWh
- Require 25 panels per home
- 1,100 solar panels required
- Mounted on 88'x10' structure



CARBON SEQUESTRATION

- Existing mature forest on site approx. 0.56 acres
- 0.56 acres sequesters approx. 5.2 tons of CO2/year
- Minimum of 138 new trees planted
- Trees under 10 years old sequester approx. 13 lbs CO2/year
- Estimate 1,600 lbs CO2/year from new plantings

OPPORTUNITIES

- Cluster development preserves habitat
- Monarch trees provide unique focal points
- Space for green development

CONSTRAINTS

- Existing vegetation dictate layout
- Limit burden on existing streets
- High upfront cost to building
- Maintenance costs of solar and geothermal
- Natural swales and land form

0' 100' 200' 400'



CHERRY VILLAGE CLUSTER COMMUNITY DESIGN PENDLETON, SC

NOTE: HOUSING UNIT (52)

CARBON SEQUESTRATION: 61.1KIBS

PV ARRAY (5800)

TREE NUMBER (>10 YEAR OLD):100

PV PANEL FOR EACH CLUSTER (7)

TREE NUMBER (<10): 1000

GEOTHERMAL WELL (50)

PARKING LOT (54)

COMMUNITY CENTER (1)



HOUSING LAYOUT

- THREE-STORIES HOUSING
- GREEN ROOF/PV PANEL
- GARAGE DESIGN



TWO TYPES OF CLUSTERS
THREE-STORIES AND TWO-STORIES HOUSING. ALL PARKING IN ONE GARAGE FOR EACH UNIT

STORMWATER DESIGN

- HEADWATER
- RAIN GARDEN
- FLOODING STAIRS
- DRY POND



THREE STRATEGIES TO MITIGATE STORMWATER:
1. PLANTING ABSORPTION
2. DRY POND COLLECTION
3. PERMEABLE MATERIAL

CIRCULATION DESIGN

- INTERSECTION
- PEDESTRAIN ISLAND
- TWO-LINE STREET
- ENTRANCE DESIGN
- PARKING LOT



THREE ENTRANCES THAT CONNECT CHERRY ST AND CALHOUN BLVD. FIVE ISLAND SERVES COMMUNITY RECREATIONAL ACTIVITIES

PLANTING COMMUNITY

- HICKORY-OAK WOODLAND (THESE TREES PROVIDE, VIA ACORNS AND HICKORY NUTS, IMPORTANT FORAGE FOR AN ARRAY OF WILD ANIMAL)



DIFFERENT TYPES OF PLANTING DESIGN INCLUDE EDIBLE AND BLOOM PLANTS IN COMMUNITY GARDEN. PROVIDING CONVENIENCE FOR THE WHOLE COMMUNITY

RESERVED AREA

- MONARCH TREE
- FENCING TREE
- NATURAL HABITAT



RESERVING AREAS FOR BIG PLANTS AND PURPOSE MULTIPLE OTHER MONARCH TREES IN THIS AREAS. FENCING TREE MITIGATE FLOODING HAZARD

DESIGN PROGRAM

- PV ARRAY
- GEOTHERMAL WELL
- SHARING GARDEN
- SPORT FIELD
- COMMUNITY CENTER



THE PV ARRAY GEOTHERMAL PROVIDE ENERGY FOR COMMUNITY ELECTRICITY OPEN FIELD, COMMUNITY CENTER ENRICH RESIDENTS EVERYDAY LIFE



TWIN OAKS LARC 8230 Community Design Pendleton, SC Annie Steele

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- Patio included

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