

Daybreak – a sustainable Case Study

The reality of building green

Presentation by Grace H. Kim, AIA provided courtesy of Schemata Workshop for the 2008 National Cohousing Conference

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Professional background

- architect/cofounder of Schemata Workshop
- Washington St University - BArch
- Univ of Washington - MArch
- area of focus: common house
- grant funding from UW Valle Scholar program to conduct 2-month field research in Denmark
- have visited over 20 communities in DK, and 20 in North America
- designed Daybreak Cohousing in Portland, OR



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Outline



Overview of Green Programs – measurability
Sustainable Strategies considered
Where we are at start of construction

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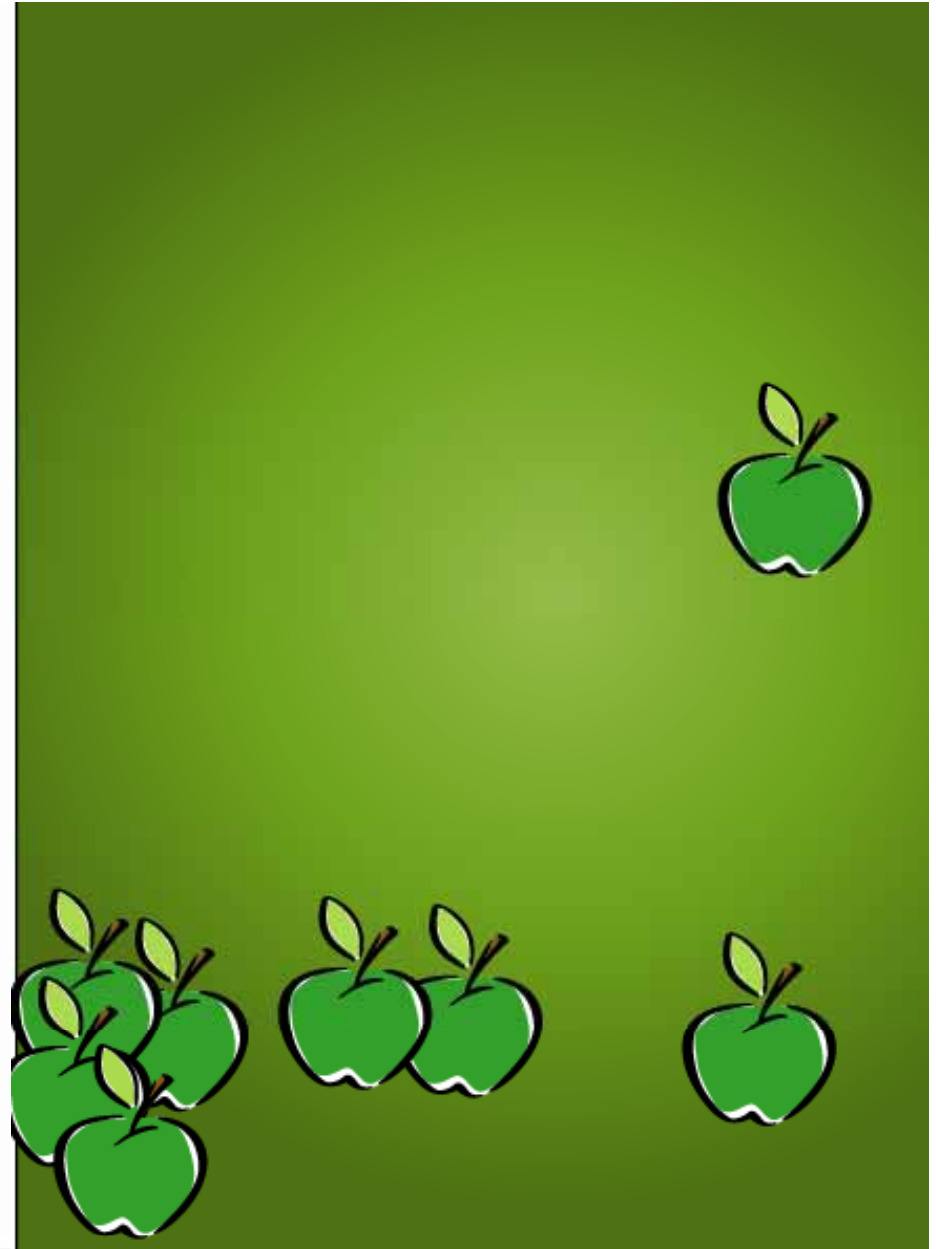
What shade of "Green"?

Owner's goals

Earth Advantage / Built Green

LEED certification

Living Building Challenge



Owner's perspective

"As Green as I can within budget"

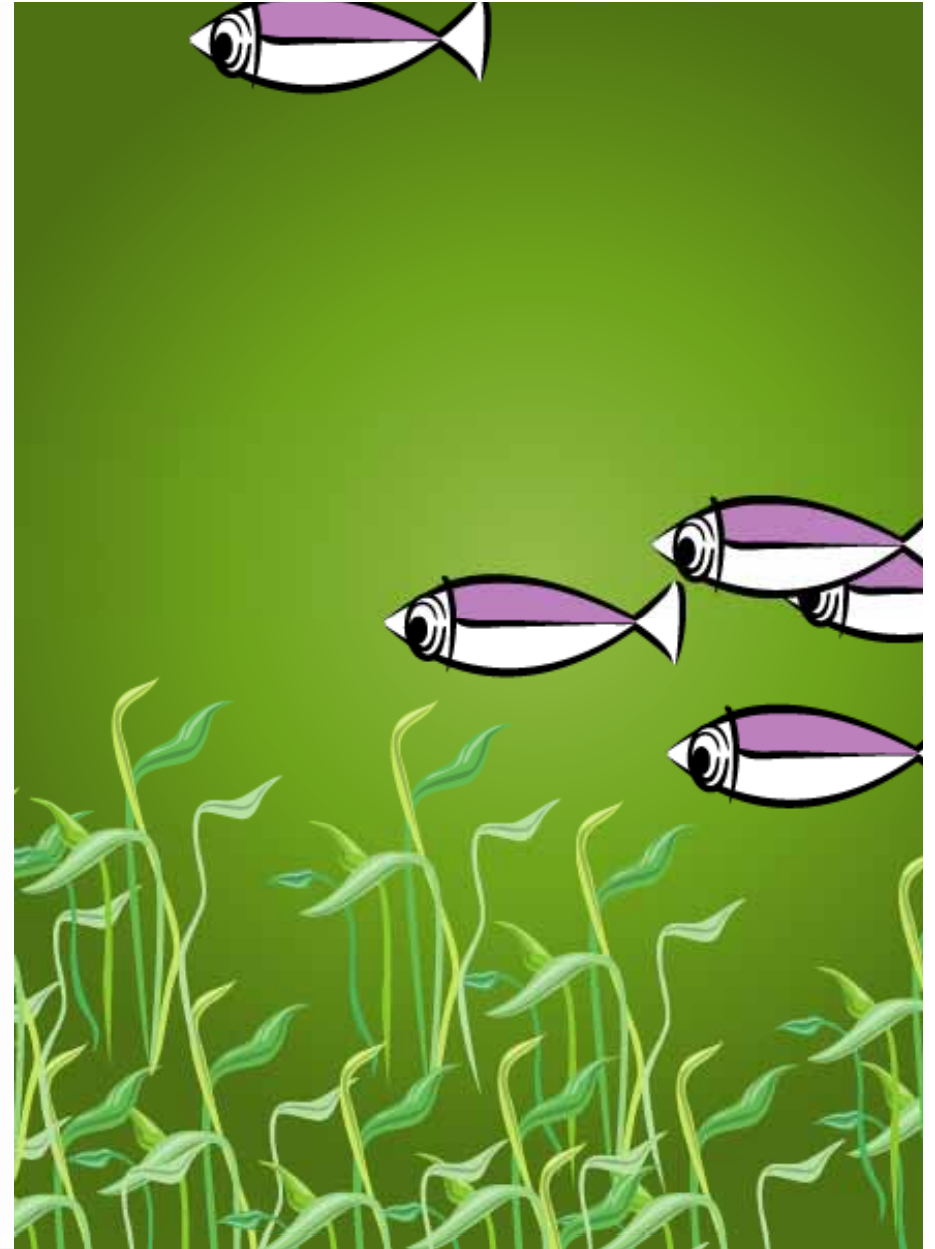
Green Roofs and PV panels

Geothermal heating

Using energy star appliances

Low VOC paints & finishes

South facing trombe walls



Earth Advantage / Built Green

Regional Builder programs



Energy Efficiency



Indoor Air Quality

Environmental Responsibility

Resource Efficiency

Water Quality

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LEED Certification / USGBC

Sustainable Sites	14 points
Water Efficiency	5 points
Energy & Atmosphere	17 points
Materials & Resources	13 points
Indoor Environmental Quality	15 points
Innovation in Design	5 points



Certified 26-32

Silver 33-38

Gold 39-51

Platinum 52-69

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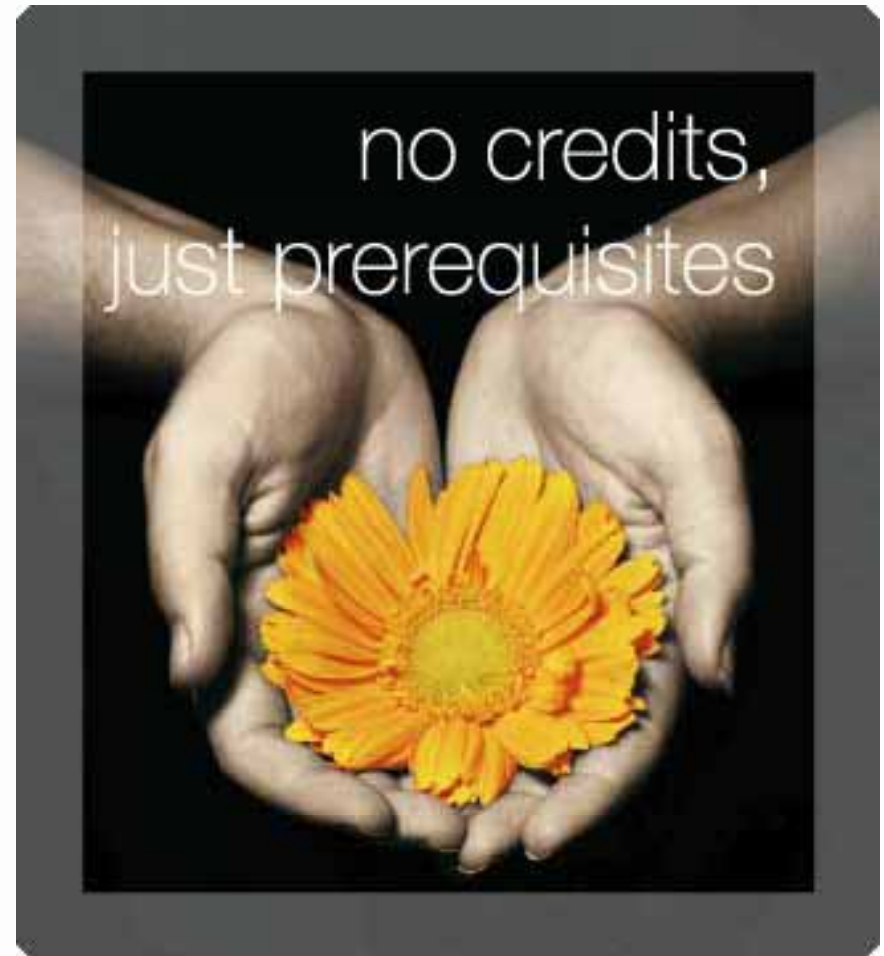
Living Building Challenge / Cascadia

A building that

- generates all of its own energy with renewable resources
- captures and treats all of its water, and
- operates efficiently, *and* for maximum beauty

6 performance areas:

Site, Energy, Materials, Water, Indoor Quality, and Beauty + Inspiration



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Daybreak Goals

Serve as role model

Consider human habitat

Plan for the future

Minimize ecological footprint

Contribute to urban ecology

Holistic design

Maintain economic sustainability



Conflicting objectives

Gas appliances (IAQ)

Hot tub (energy consumption
& chlorine)



sustainable feature	project milest	Sustainability C	Schematic Des	Design Develo	Construction D	Future
site planning / massing						
southern orientation of buildings						
thermal mass						
sunshading at west & south elevations						
reduce windows on west elevations						
exterior roller shades on west elevations						
water						
reuse of existing basements						
rainwater collection and water reuse						
stormwater detention						
light and ventilation						
daylighting						
operable windows						
non-vinyl windows						
through ventilation of units						
gas appliances						
heating & appliances						
central boiler						
heat recovery ventilators						
energy star appliances and fixtures						
infloor hydronic system						
units						
smaller units						
adaptable units						
visibility - elevator access to all units						
shared common areas						
transportation						
prioritizing cycling over auto						
landscaping						
green space / preserve tree						
native plantings						
finishes						
low VOC paint						
no carpeting						
construction						
high reflectivity roofing						
advanced framing - efficient 2x4 framing						
minimize construction waste						
recycling construction materials						
locally sourced materials						
active technologies						
green roof						
solar hot water						
photovoltaics- net metering						

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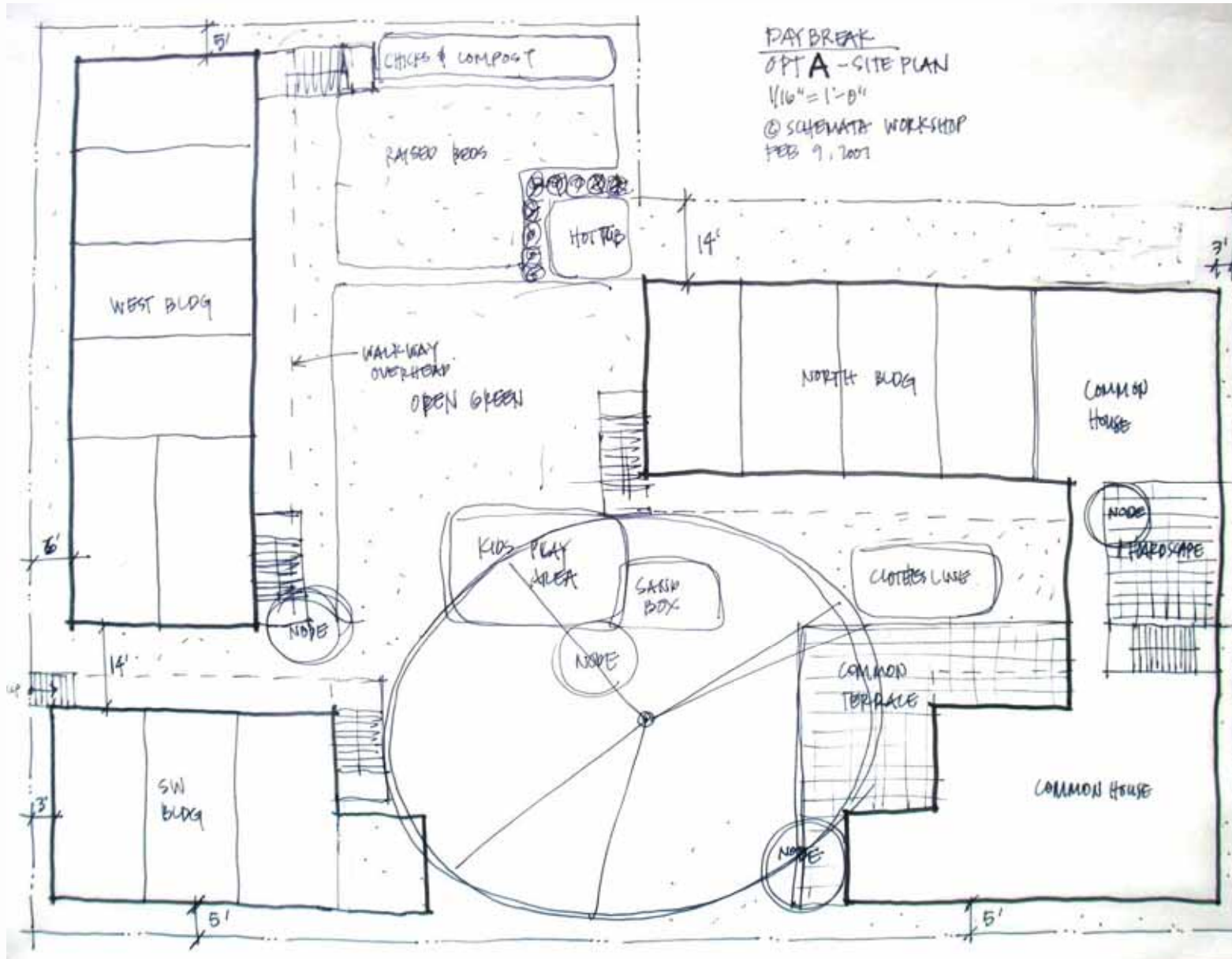
site planning / massing

- Southern orientation
- Thermal mass
- Sunshading west / south
- Reduce west facing windows
- Exterior roller shades

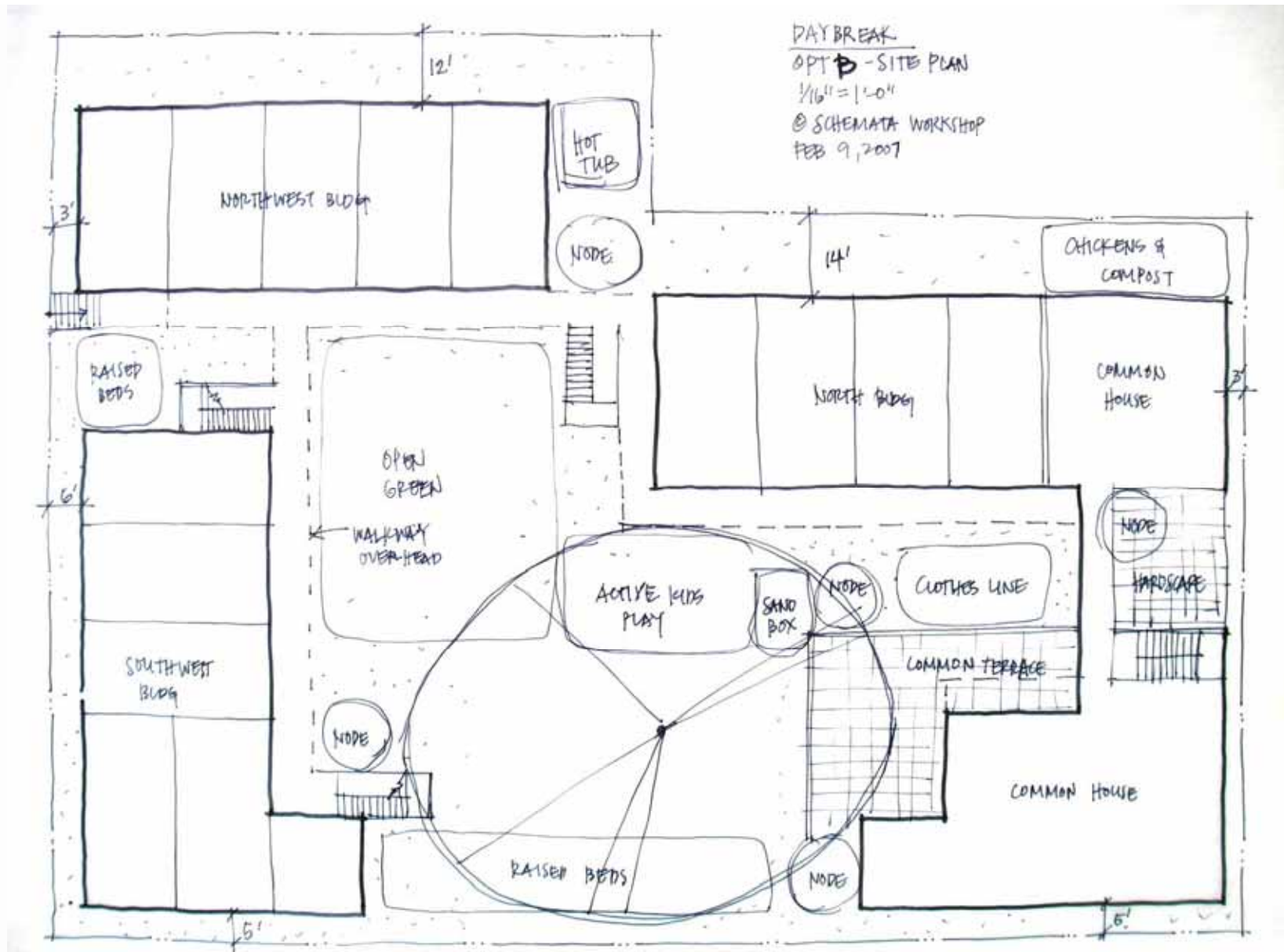


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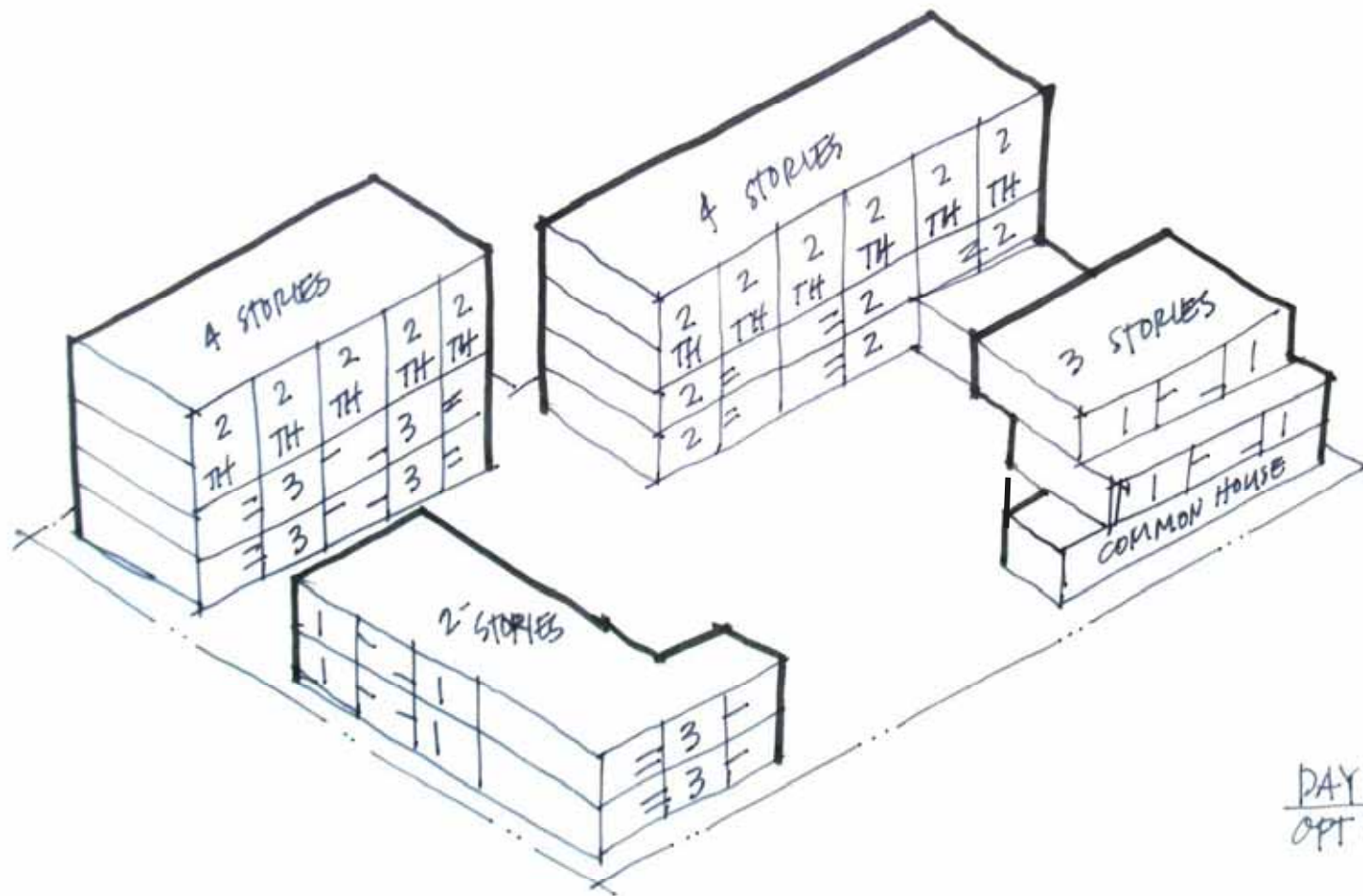




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1-BR (8)
 2-BR (16)
 3-BR (6)

 30 UNITS

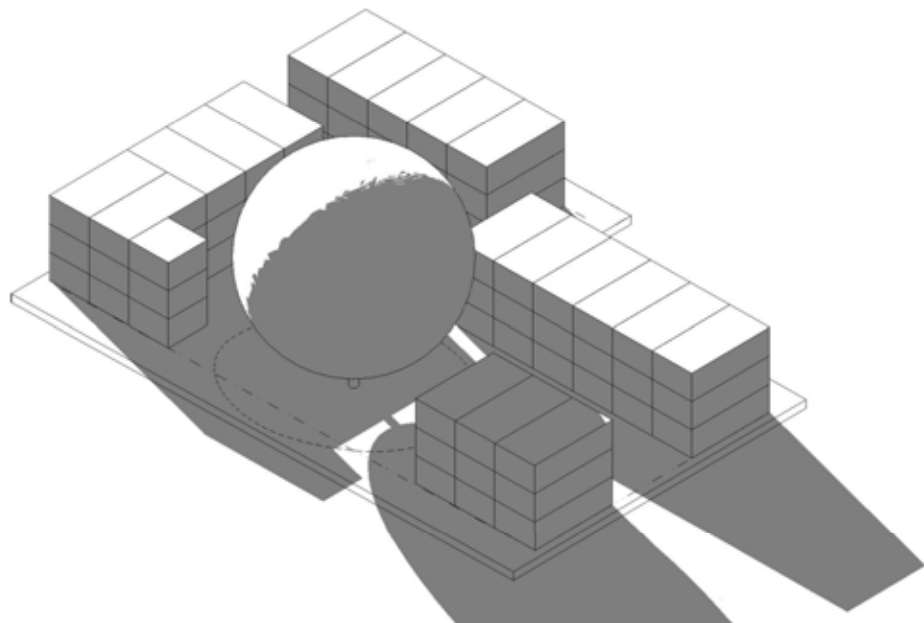
DAYBREAK
 OPT B - UNIT MIX

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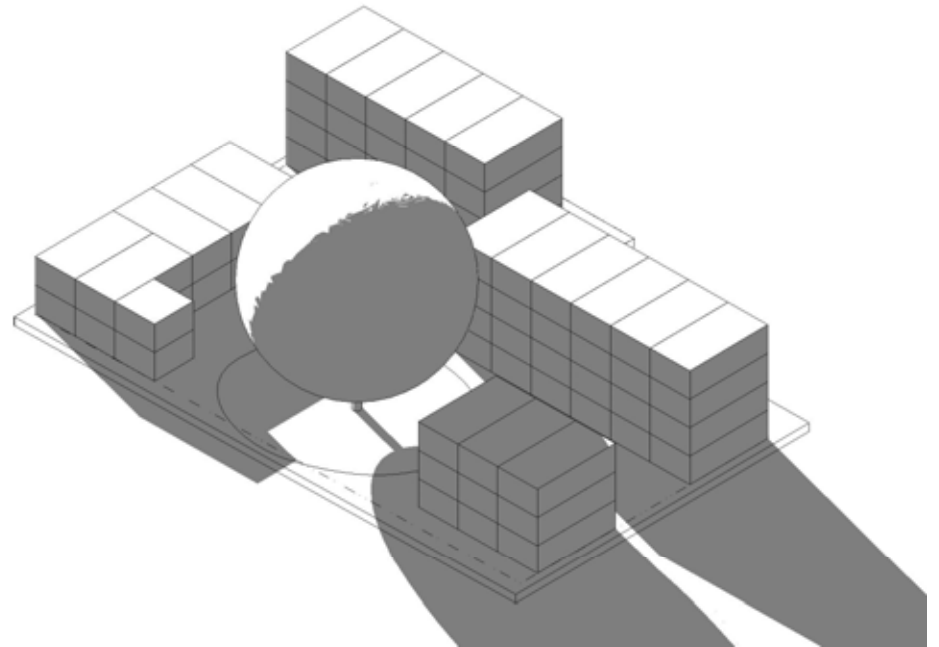
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3-story massing



2/4-story massing



6:00 p.m.

summer solstice june 22, 2007

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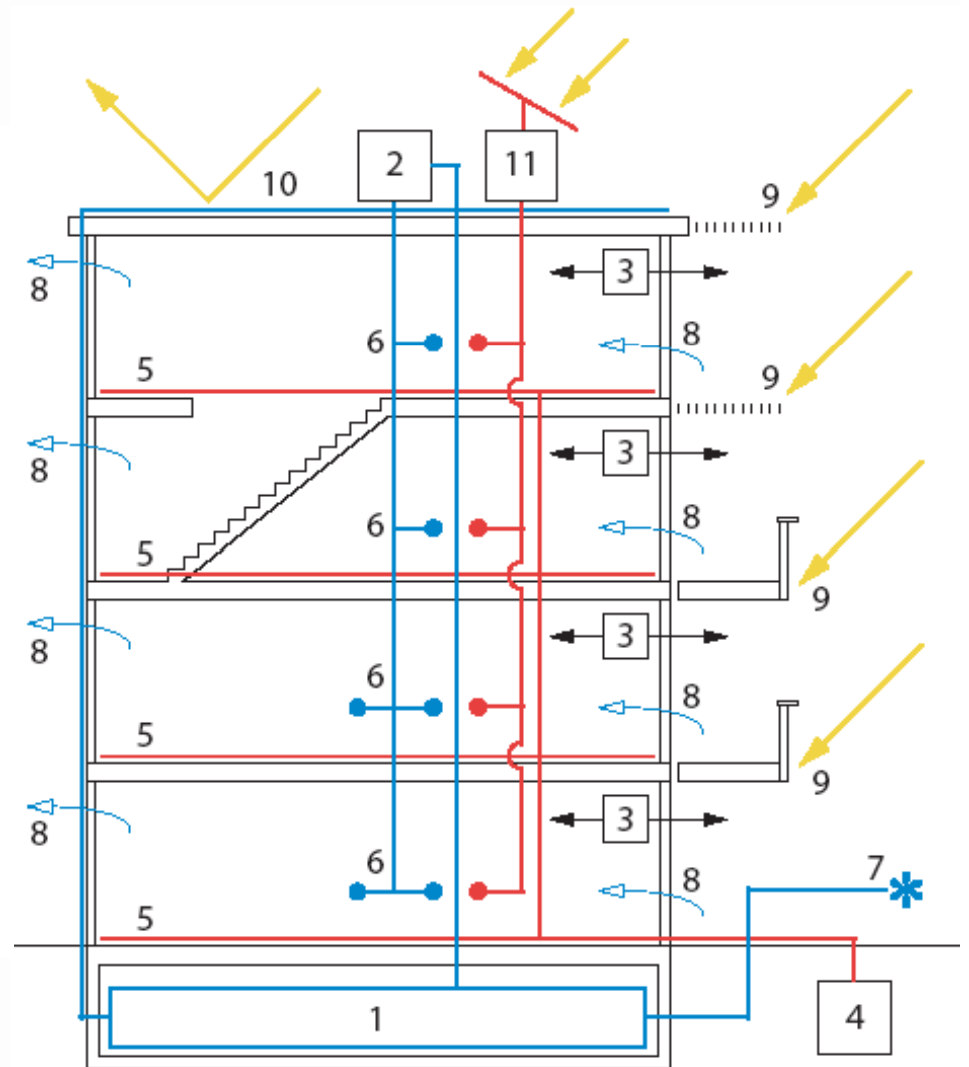
site planning / massing

- Southern orientation
- Thermal mass
- Sunshading west / south
- Reduce west facing windows
- Exterior roller shades

concept diagram

Cross-section of residential building showing energy concepts

- 1 Rainwater collection bladder in existing basement
- 2 Rainwater storage tank
- 3 Heat recovery ventilation
- 4 Central high-efficiency boiler
- 5 Radiant hydronic underfloor heating
- 6 Rainwater toilet flushing and Common House Laundry
- 7 Rainwater irrigation
- 8 Through-unit natural cooling & ventilation
- 9 Exterior sun shading for south facade
- 10 High-reflectivity, water-collecting roof membrane
- 11 Solar hot water collector and storage tank



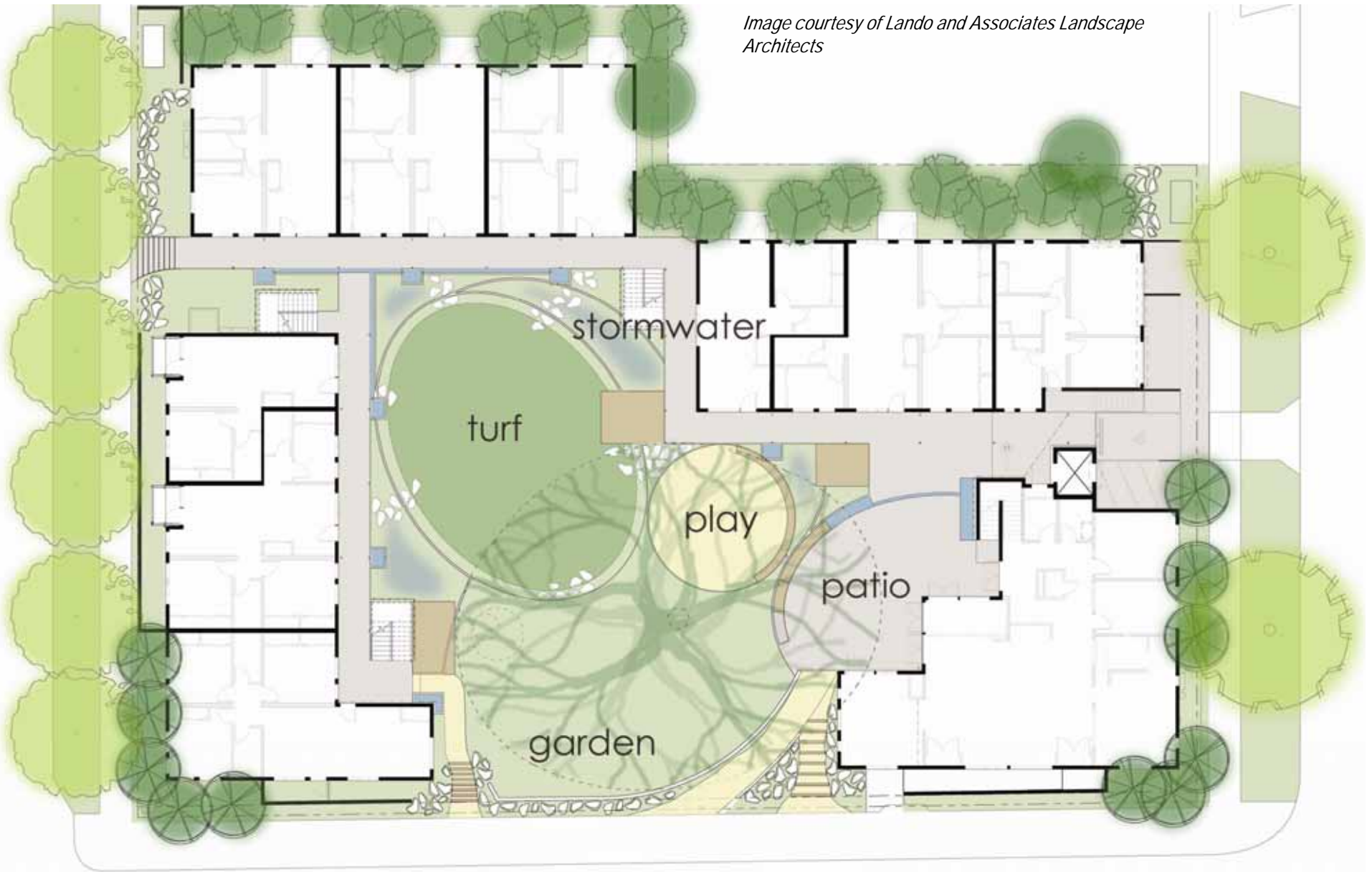
water

- Rainwater collection & reuse
- Reuse existing basements
- Stormwater detention



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Image courtesy of Lando and Associates Landscape Architects



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light & ventilation

- Daylighting
- Operable windows
- Non-vinyl windows
- Thru ventilation
- Gas appliances (IAQ)



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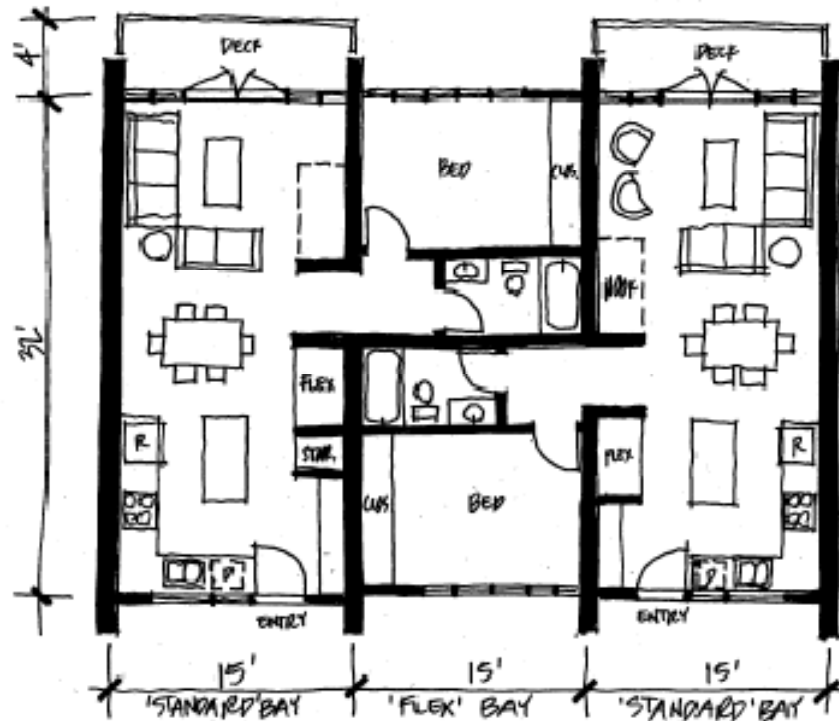
heating & appliances

- central boiler
- heat recovery ventilators
- energy star appliances and fixtures
- in-floor hydronic heating system



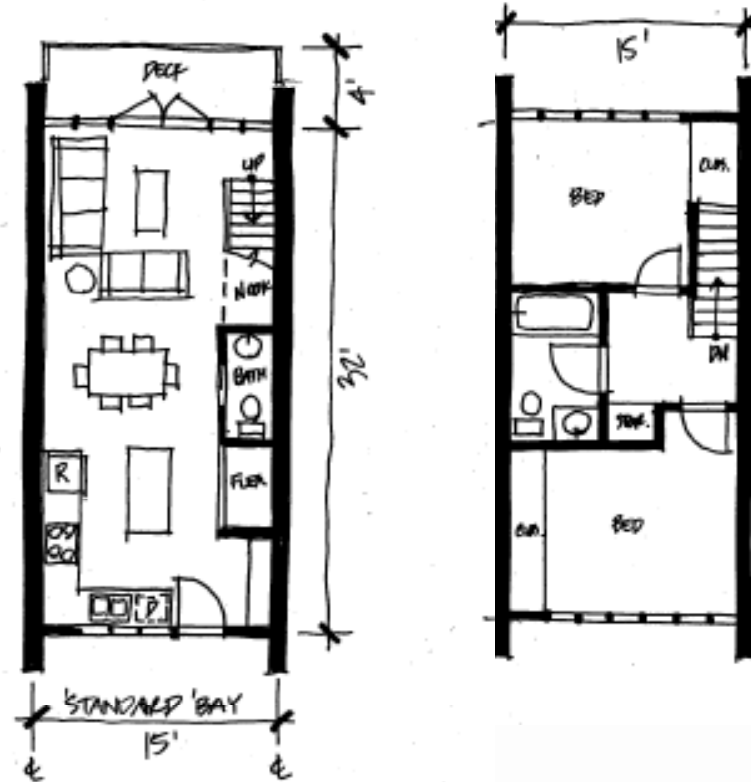
units

- smaller, flexible units
- more common amenities



TYPICAL GROUND FLOOR UNITS
(SHOW ARE 2 (1) BR UNITS)

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1.06.07



TYPICAL GROUND FLOOR - TOWNHOUSE

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accessibility

- adaptable units
- visitability / elevator access to all units

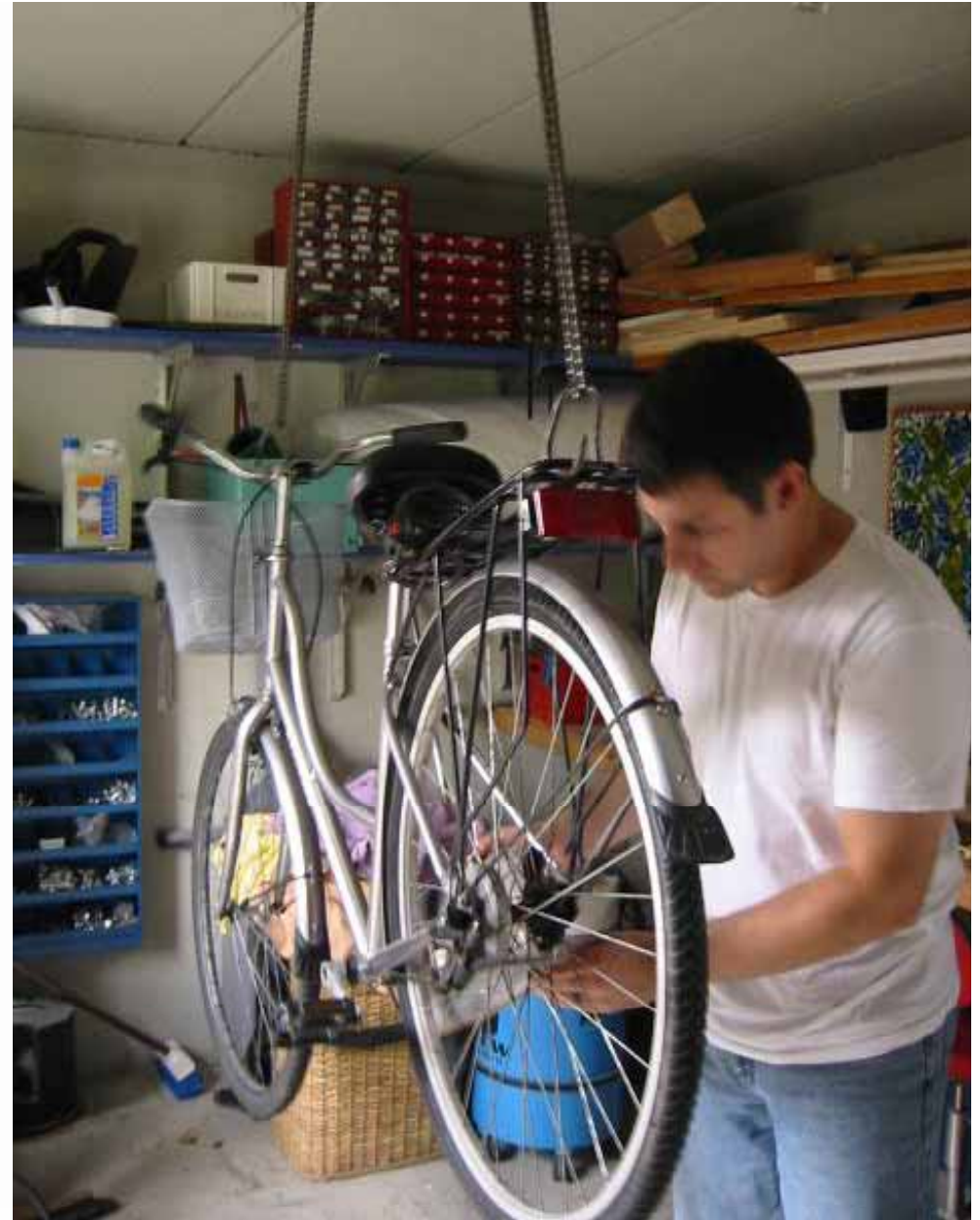


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transportation

prioritizing cycling over auto

- indoor bike parking – 90 bikes
- bike shop in common house
- no onsite auto parking
- proximity to bus / light rail



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landscaping

- Provide green space
- Preserve tree
- Use of native plantings



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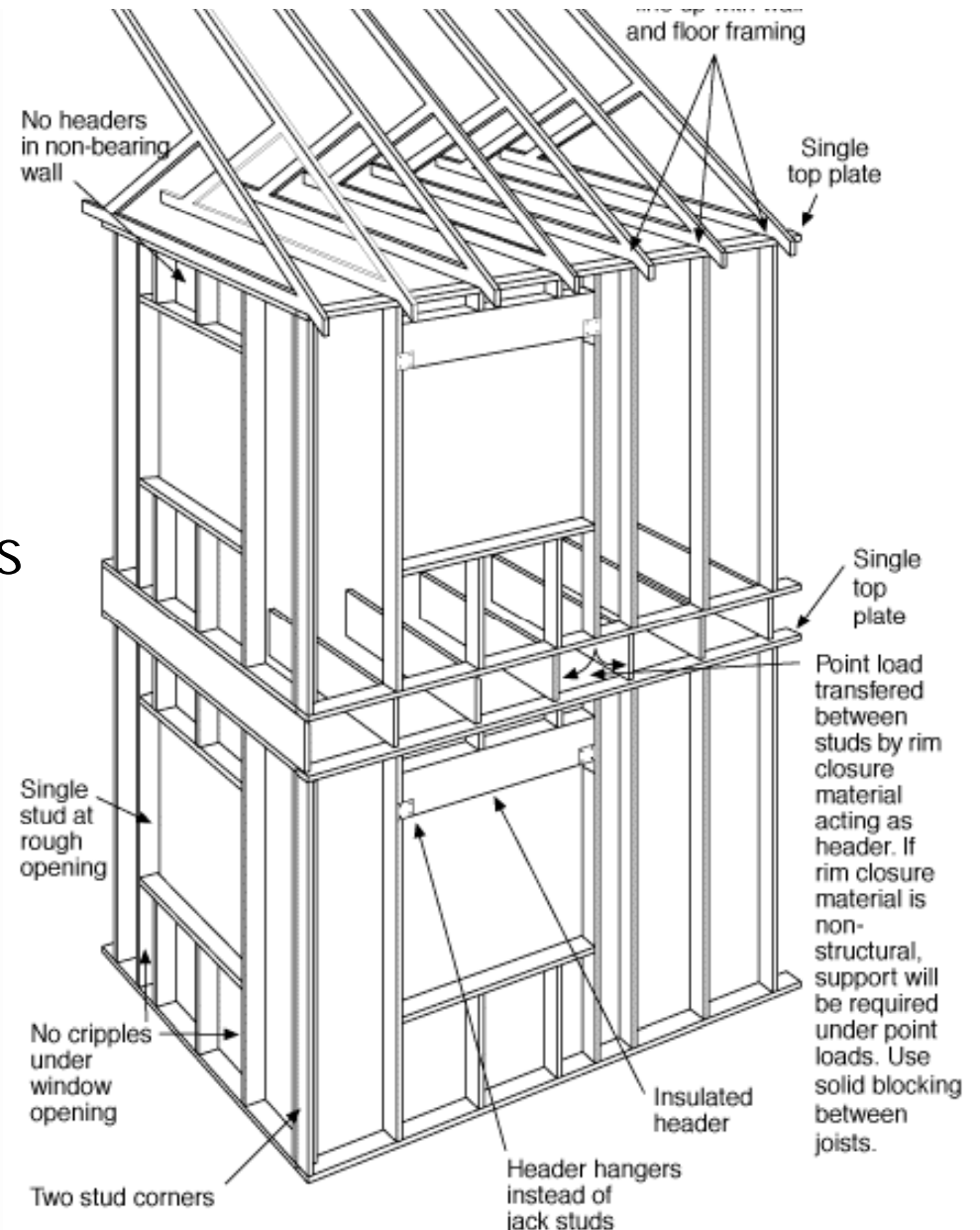
finishes

- low VOC paints and sealants
- no carpeting
- exposed concrete floor



construction

- advanced framing
- minimize construction waste
- recycling construction materials
- locally sourced materials
- high reflectivity roofing



active technologies

- green roof
- solar hot water heater
- photovoltaics – net metering



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Sustainability Charette

sustainable feature		project milestones	Sustainability	Future
site planning / massing				
	southern orientation of buildings			
	thermal mass			
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	reduce windows on west elevations			
	exterior roller shades on west elevations			
water				
	reuse of existing basements		■	
	rainwater collection and water reuse		■	
	stormwater detention		■	
light and ventilation				
	daylighting		■	
	operable windows		■	
	non-vinyl windows		■	
	through ventilation of units		■	
	gas appliances		■	
heating & appliances				
	central boiler		■	
	heat recovery ventilators		■	
	energy star appliances and fixtures		■	
	infloor hydronic system		■	
units				
	smaller units		■	
	adaptable units		■	
	visibility - elevator access to all units		■	
	shared common areas		■	
transportation				
	prioritizing cycling over auto		■	
landscaping				
	green space / preserve tree		■	
	native plantings		■	
finishes				
	low VOC paint		■	
	no carpeting		■	
construction				
	high reflectivity roofing		■	
	advanced framing - efficient 2x4 framing		■	
	minimize construction waste		■	
	recycling construction materials		■	
	locally sourced materials		■	
active technologies				
	green roof			■
	solar hot water		■	
	photovoltaics- net metering			■

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Schematic Design

	project milestones	Sustainability	Schematic Design	Future
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Design Development

	project mile	Sustainability	Schematic D	Design Deve
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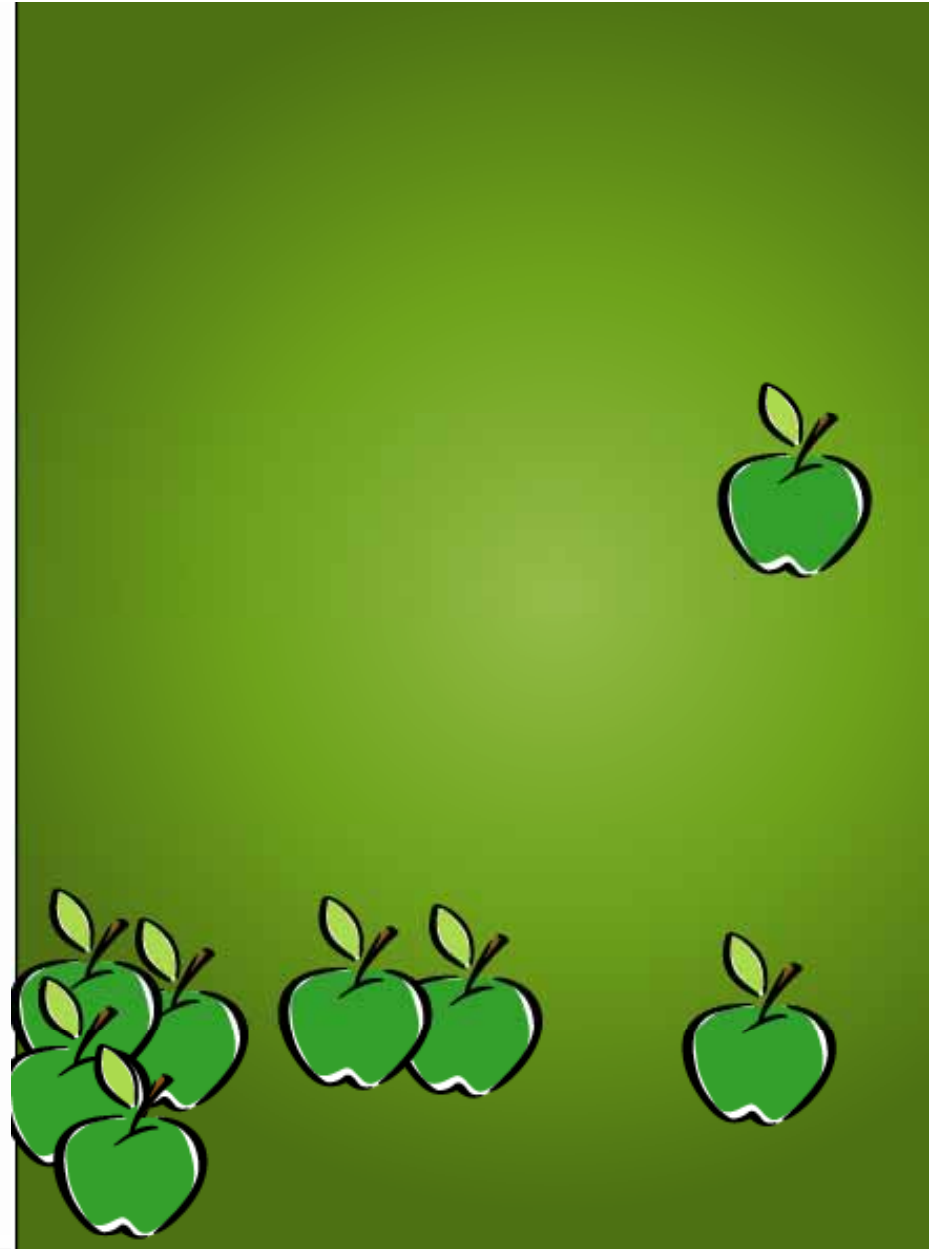
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No matter what shade

Be consistent

Set policies

Enforce policies



Questions?



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