

About Southface



Southface promotes sustainable homes, workplaces and communities through education, research, advocacy and technical assistance.



Photo: Jonathan Hillyer, 2009

Green Building Services

Training

Green Building:
EarthCraft, LEED

Building Audits &
Assessments

Charrettes

Sustainability Planning

Affordable Housing

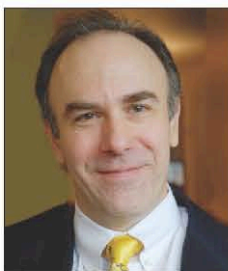
Modeling



GREENPRINTS

GREEN BUILDING CONFERENCE | ATLANTA, GA

*Thought-leading
Keynote and
Master Speakers,
plus an additional
27 speakers
already confirmed.*



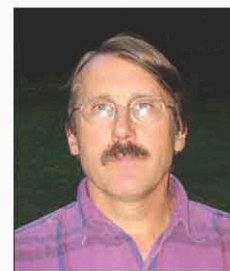
Keynote
Rob Watson,
“Father of LEED”



Master Speaker
Bill Reed



Master Speaker
Dr. Arthur C. Nelson



Master Speaker
Martin Holladay



Master Speaker
John Tooley

Save the Date
March 13-14, 2013

www.greenprints.org

2013 CO-HOSTS



House as a System

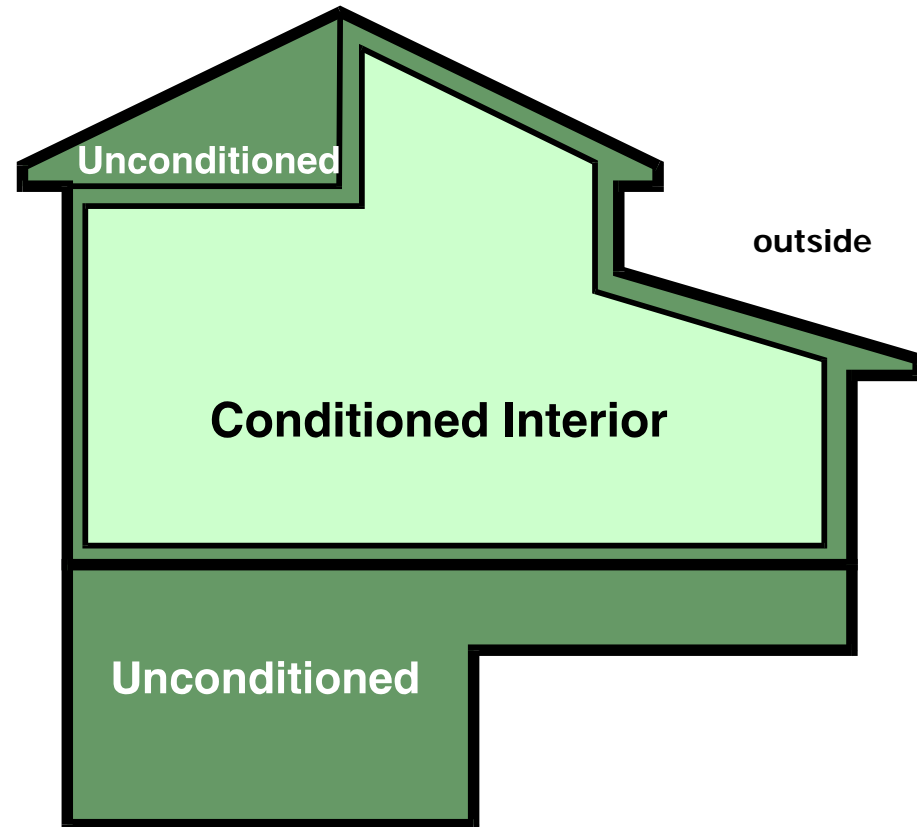
Building Envelope

Continuous air barrier

Complete insulation
coverage

Proper Heating and
Cooling Systems

Controlled Ventilation



The building envelope consists of two elements: an air barrier and insulation that must be continuous and touching

Gaps in exterior sheathing sealed

Sheathing penetrations sealed





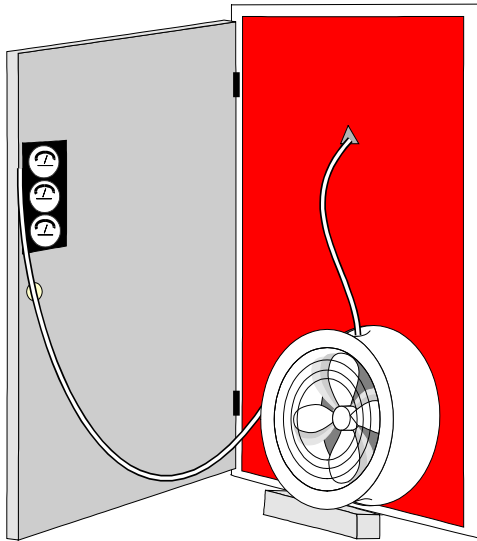
- Penetrations through band area sealed



Penetrations through insulated subfloor sealed Shower & tub drains sealed



Blower Door Testing



Provides a measurement of the actual infiltration rate

Helps identify leak paths

Tested homes can be compared to each other

Advantages of Air-tight Construction Southface



1. Control Moisture
2. Improve Durability
3. Increase Comfort
4. Reduce Indoor Pollutants
5. Save Energy

Duct Blaster





air handler and all duct
connections sealed with
mastic



Penetrations through insulated ceiling sealed



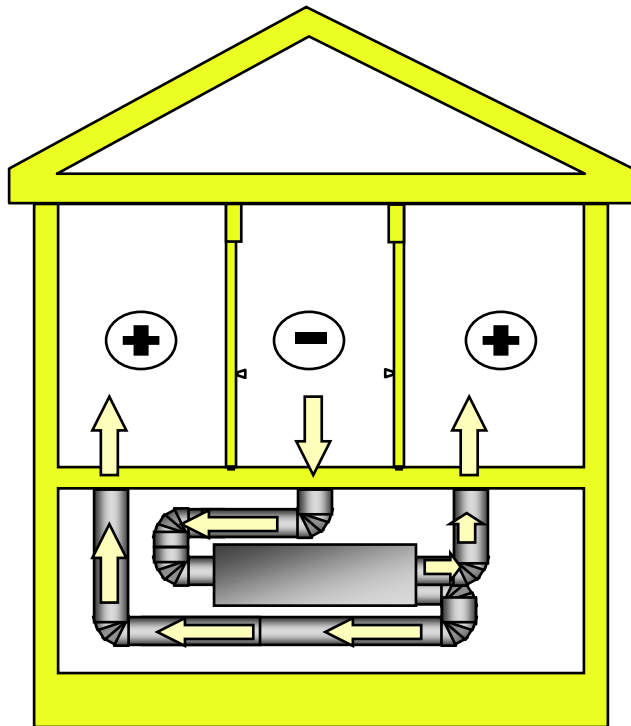
Positive Pressure Ventilation

Tends to drive pollutants out

Air enters from known source and is filtered and conditioned before being mixed with room air



Mechanical systems & exhaust fans can create pressure differentials



Proper Ventilation

Exhaust fans must vent to the exterior



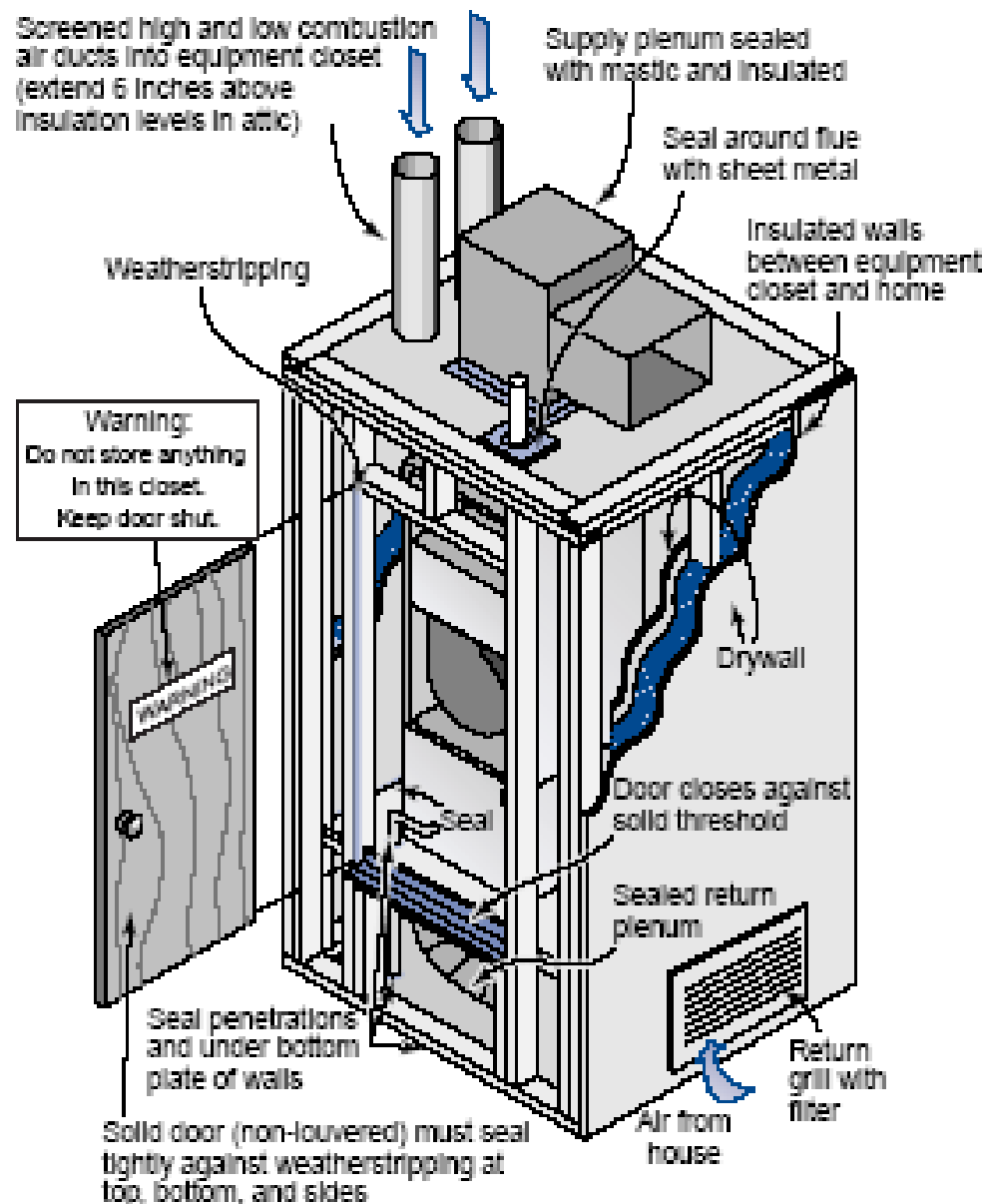
Combustion Safety

Energy efficiency should not be a health hazard

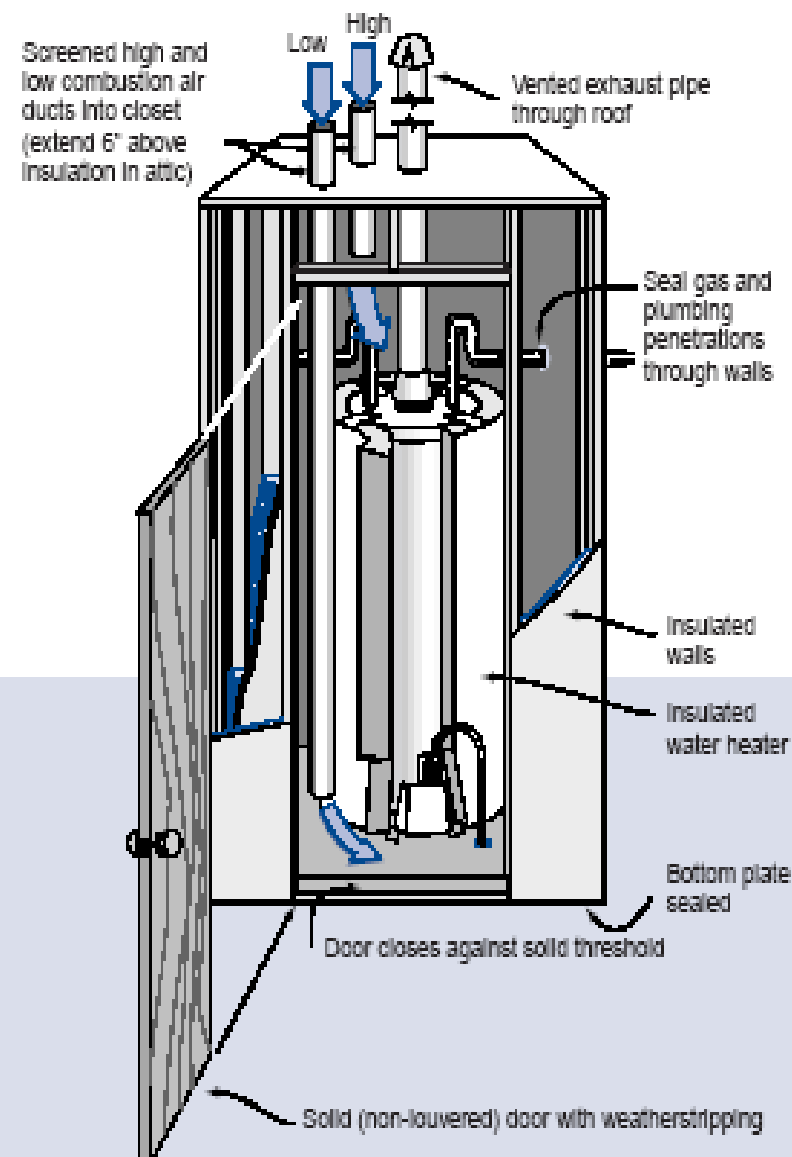
A tight house can backdraft gas appliances more easily



Combustion Closets



WATER HEATER CLOSET



A MEMBER OF THE INTERNATIONAL CODE FAMILY®



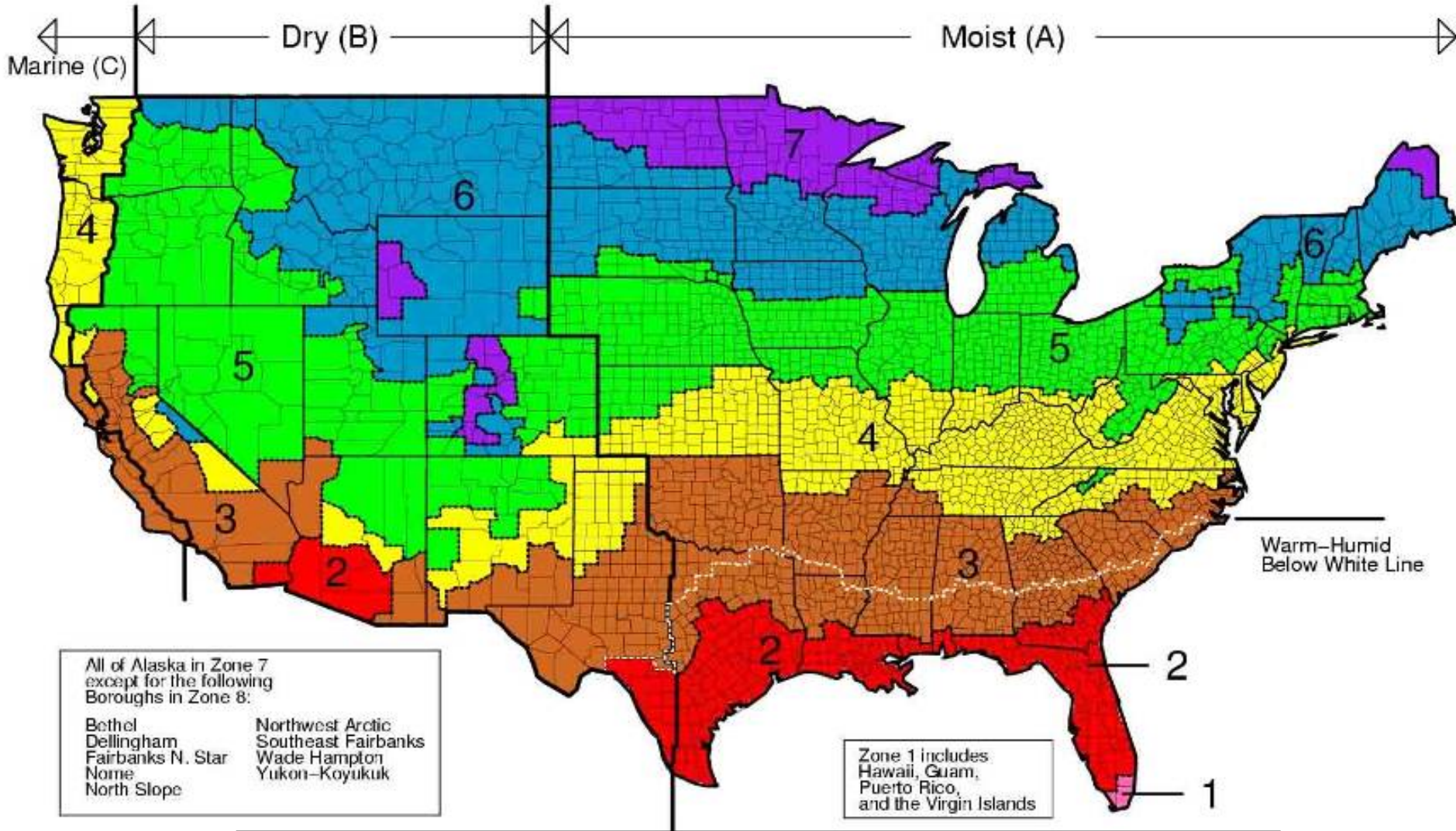
IECC®

**INTERNATIONAL ENERGY
CONSERVATION CODE®**



2006

2009 IECC Climate Zones: Chapter 3



Note: GA is in Climate Zone (CZ) 2, 3 and 4

Focus is on building envelope

- Ceilings, walls, windows, floors, foundations

- Sets insulation levels, window U-factors and SHGC

- Infiltration control

 - Caulk and seal to prevent air leaks

 - Verify tight envelope with blower door

Limited Heating, Air Conditioning, and Water Heating requirements

Ducts

- No cavities as ducts

- Seal with mastic and insulate

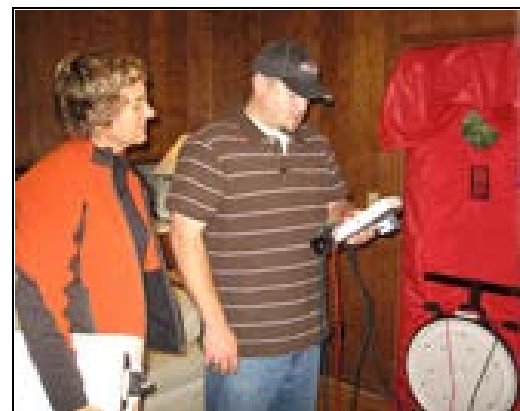
- Verify tight with duct pressurization test

Lighting equipment

- 50% of lamps to be high-efficacy lamps

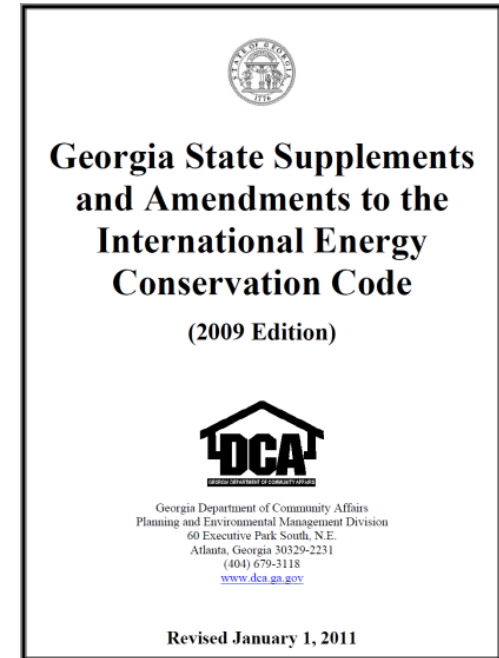
- Lighting control options

No appliance requirements



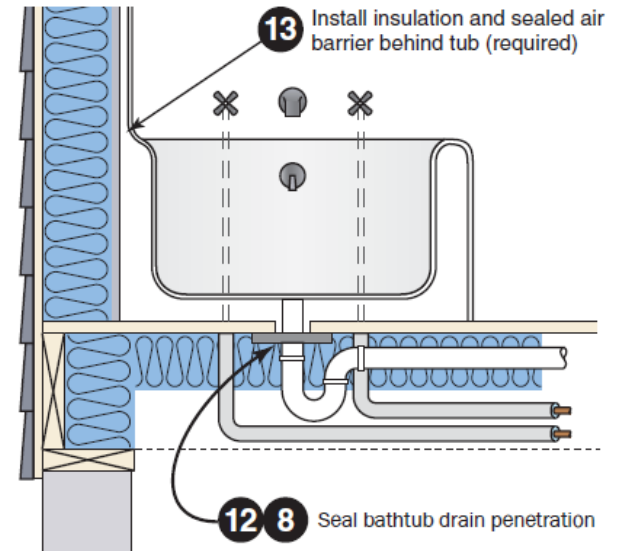
Ways we have made the code better

1. Improved Kneewalls
2. Consistent Windows
3. Air Sealing Graphics
4. Minimum Insulation Thresholds
5. Lighting Vacancy Sensor Credit
6. Better Ducts - Require Mastic
7. No Electric Furnaces
8. No Powered Attic Ventilators (except solar powered)
9. Mandatory Blower Door and Duct Blaster test
10. Qualifications of Verifiers— (who can do testing)



Appendix A - Air Sealing Blocking & Sheathing Southface

Solid sheet behind tubs & showers on insulated walls (p. 19)



Call back waiting to occur

Call back prevention



402.2.1 - Ceilings with Attics

- R-30 (CZ2 & 3) or R-38 (CZ4) are prescriptive requirements
- GA: R-19 acceptable under HVAC attic platforms (32 s.f./platform + 32" walkway)
- Rulers required every 300 s.f.



402.2.2 - Ceilings without Attics

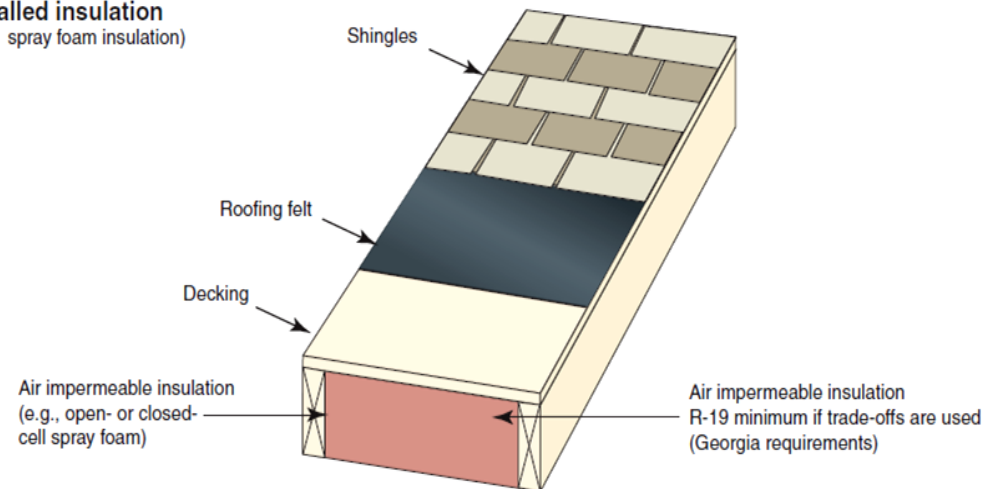
R-30 for 20% (up to 500 s.f.) acceptable for CZ4

Vaulted ceilings and foam sprayed rooflines will need to perform an R-value trade-off (REScheck)

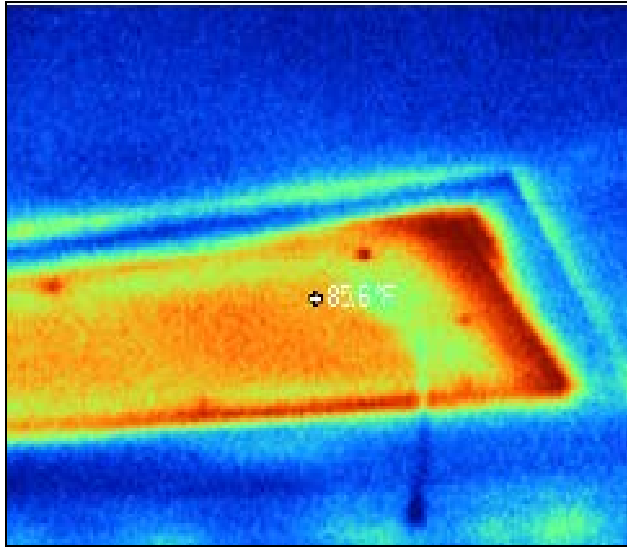
GA specific: Can trade down to R-19 if only spray foam insulation is used (air impermeable insulation)



Air impermeable
installed insulation
(e.g., spray foam insulation)



402.2.3 - Attic Access



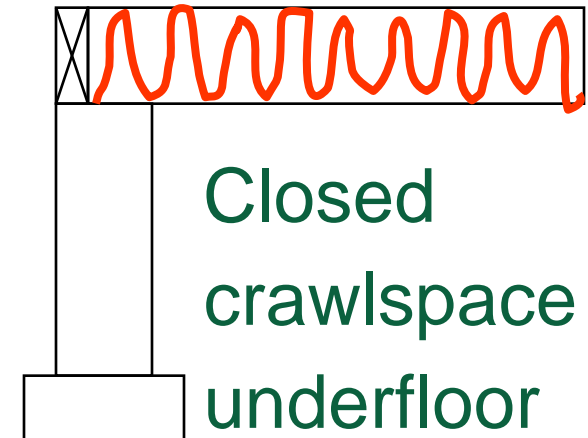
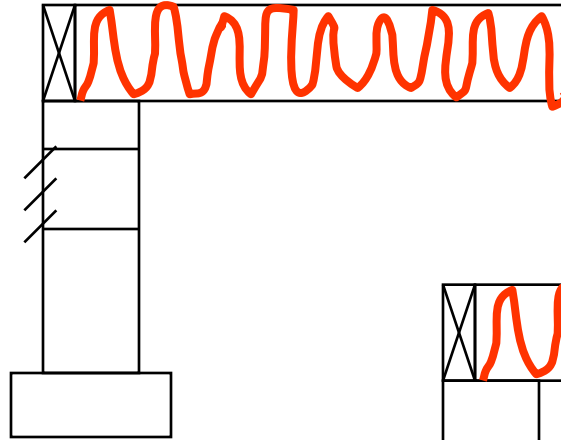
- Weather-strip and insulate access doors (GA clarification)
 - Vertical doors: R-5
 - Pull-down stairs: R-5
 - Hatches/scuttle hole covers: R-19

- If 990 s.f. = R-30,
and 10 s.f. = R-1,
Effective R-value = R-23!

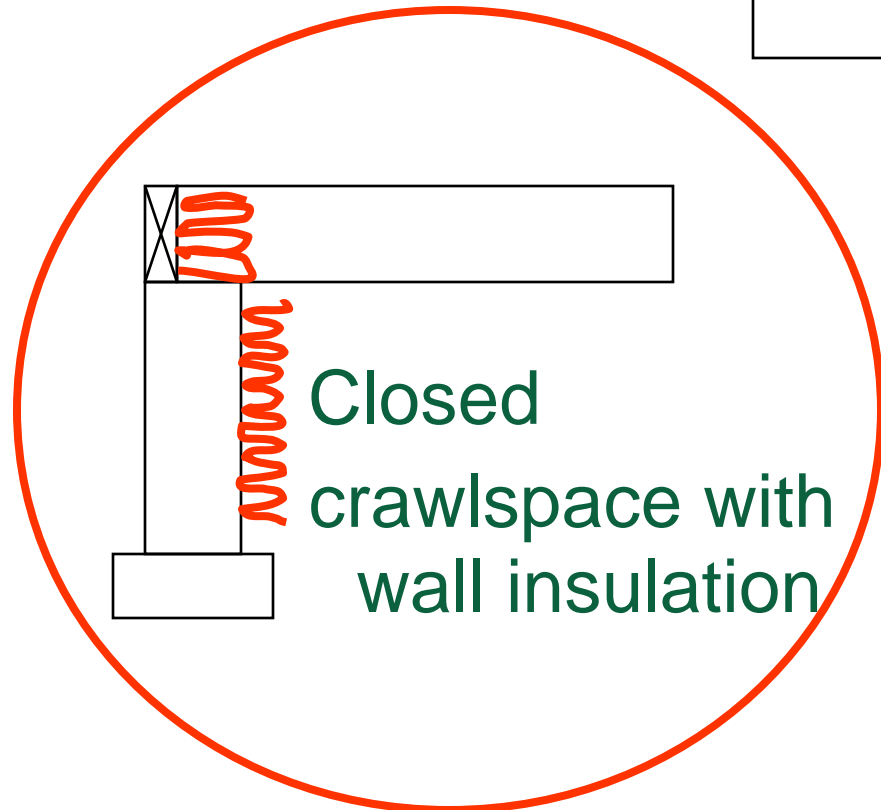


402.2.9 Crawlspace Walls - 3 Options

Standard vented
crawlspace -
underfloor insulation



Closed
crawlspace
underfloor
insulation



Closed
crawlspace with
wall insulation

- **Note:** all crawlspaces must meet vapor retarder requirements, as per IRC

Closed Crawlspaces

Seal ground with plastic (6" up walls, 6" overlaps)

Insulate interior of walls to satisfy code
(R-10 in CZ4, R-5 in CZ3, R-0 in CZ2)

Eliminate all vents and leaks (access doors)

Satisfy IRC exception to vent requirement (2006 IRC section R408.3)

Venting Exceptions:

- Continuous exhaust (radon)
- Direct condition crawlspace (supply)
- Direct condition (dehumidifier)



Critical Details:

- No drainage problems
- Use a sealed combustion / direct vent furnace or install a Heat Pump
- Pest Control and Code Official awareness

402.3 Fenestration Requirements

Low-e effectively required!

Maximum fenestration **U-factor** = **0.50**
in CZ 2&3 or = **0.35** in CZ4

Area weighted average of fenestration

Maximum **SHGC** = **0.30** for all glazing

Delayed effective date (July 1, 2011)
for Climate Zone 4 only

Area weighted average of fenestration

1. Show compliance by having all glazing be ≤ 0.30
2. Perform REScheck weighted average trade-off

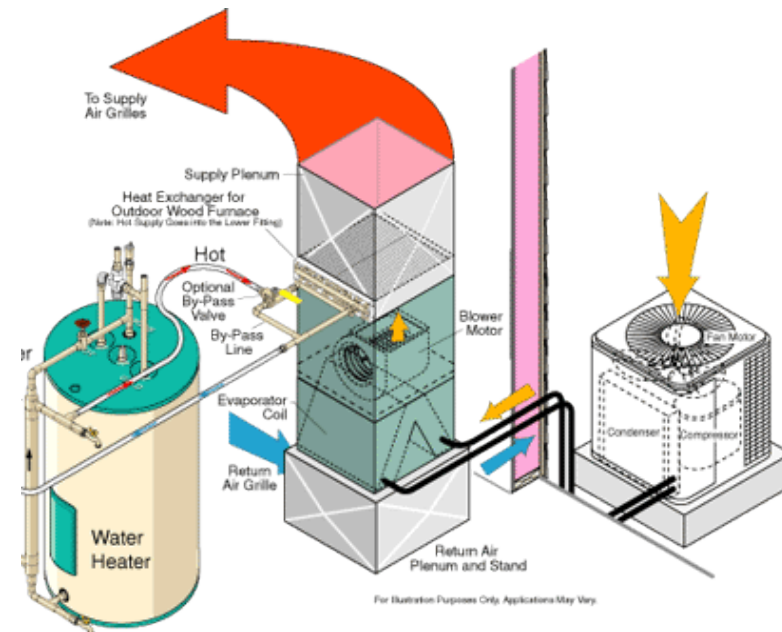
 National Fenestration Rating Council® CERTIFIED	World's Best Window Co. Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S./I-P) 0.30	Solar Heat Gain Coefficient 0.30
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance 0.51	Air Leakage (U.S./I-P) 0.2
<small>Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. www.nfrc.org</small>	

Section 403.1 - HVAC Controls

Mandatory Requirement:

Programmable thermostat required for furnace

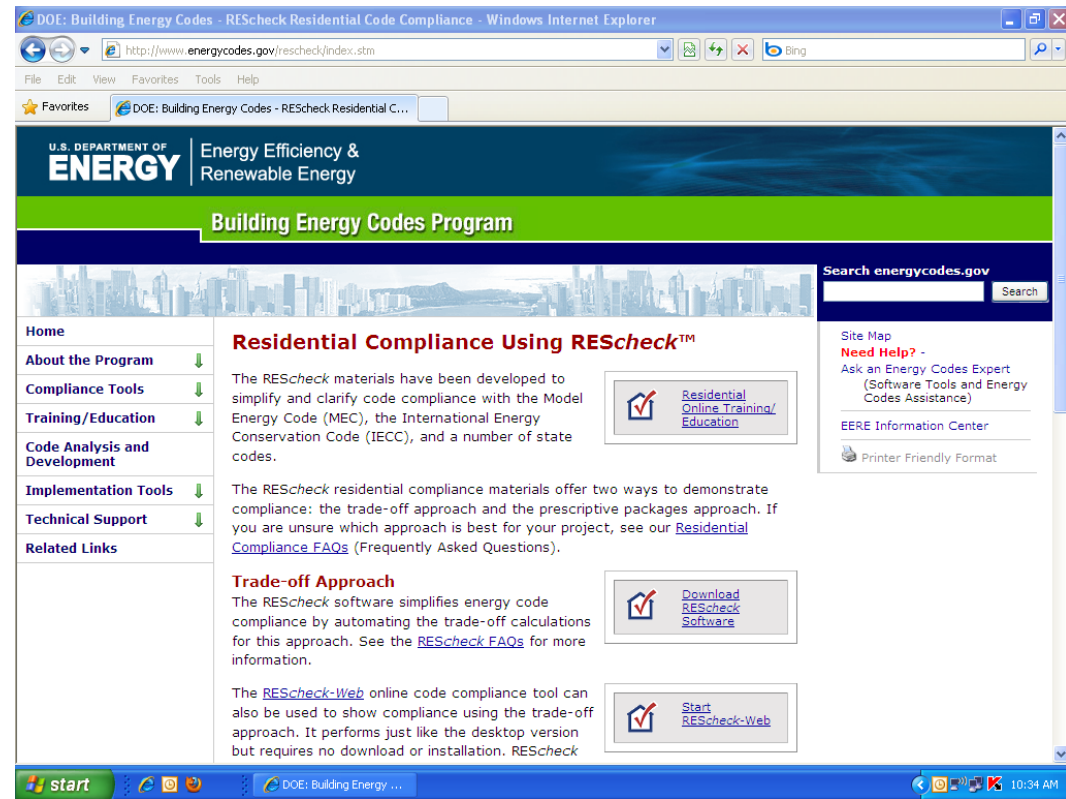
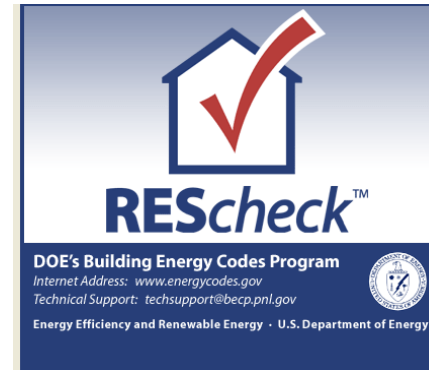
Heat Pump requires smart thermostat or lockout feature to prevent unnecessary strip heat



REScheck™ Software



www.energycodes.gov
Software evaluates
specific designs quickly
Demonstrates SHGC
compliance
Allows trade-offs
Building envelope
components
No longer for heating
& cooling equipment
efficiencies
GA specific version
(coming soon)



A photograph of a row of houses, likely in a suburban neighborhood. The houses have light-colored siding and dark shutters. A large, mature tree with green leaves stands in front of the houses. The foreground shows a sidewalk and a street. A semi-transparent dark grey box is overlaid on the left side of the image, containing the text "EarthCraft House Project Registration and Certification Overview" in white.

EarthCraft House Project Registration and Certification Overview



Regional Green
Building Program

Partnership with Greater
Atlanta HBA

Single and Multi-Family
Residential (renovation
+ new), Communities,
and Light Commercial
Programs

Energy and Water Efficient
Dwellings

Durable and Healthy



EarthCraft Programs



Pre-Construction

- 1** Project Registration
- 2** Project Information Submittal
- 3** Preliminary Energy Model
- 4** EarthCraft Design Review

Construction

- 5** Pre-Drywall Inspection
- 6** Pre-Drywall Inspection Report Submittal

Project Closeout

- 7** Final Inspection
- 8** Confirmed Energy Model
- 9** Final Inspection Report Submittal
- 10** Certification

Step 4: Design Review

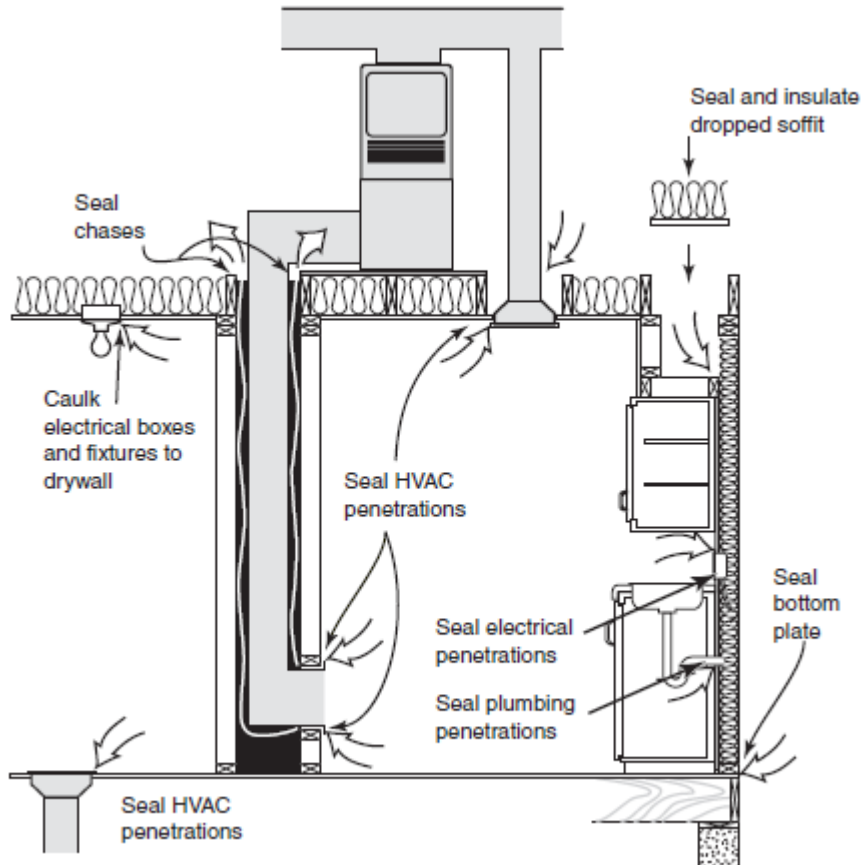
Builder Responsibilities:

- Schedule all attendees

Technical Advisor Responsibilities:

- Lead the meeting





- Criteria
- Clarifications
- Definitions
- Example
- Additional Resources
- Confirmation
 - Builder
 - Technical Advisor

EarthCraft House 2012 Worksheet



EarthCraft House Worksheet

		Points	Planned	Status
DURABILITY AND MOISTURE MANAGEMENT (DU)				
DU 2: MOISTURE MANAGEMENT				
REQUIRED AT ALL LEVELS				
DU 2.0	Gravel bed beneath sub-grade slabs	-		
DU 2.1	Capillary break and vapor barrier beneath all slabs	-		
DU 2.2	Foundation drain on top of sub-grade footing	-		
DU 2.3	Patio slabs, walks and driveways sloped $\geq 2\%$ away from home for $\geq 10'$ or to the edge of the surface, whichever is less	-		
DU 2.4	$\geq 5\%$ sloped grade away from home for $\geq 10'$	-		
DU 2.5	100% coverage of vapor barrier in crawlspace or beneath slab ≥ 6 mil	-		
DU 2.6	Do not install wet or water-damaged building materials	-		
DU 2.7	Moisture-resistant backing material behind tubs and showers	-		
DU 2.8	No wall-to-wall carpet within 3' of toilets, tubs and showers	-		
REQUIRED AT PLATINUM AND GOLD, OPTIONAL AT CERTIFIED				
DU 2.9	Foundation drain at outside perimeter edge of footing surrounded with 6" clean gravel and fabric filter	4		
DU 2.10	Drainage board and damp proofing for below-grade walls	3		
DU 2.11	Gravel bed beneath on-grade or raised slabs	1		
DU 2.12	Drain or sump pump in basement/crawlspace with sealed cover	1		
DU 2.13	Select HVAC equipment SHR \leq design SHR or install whole-house ENERGY STAR dehumidifier	3		
REQUIRED AT PLATINUM, OPTIONAL AT GOLD AND CERTIFIED				
DU 2.14	Capillary break:	Select all that apply:		
	1. Between footing and foundation	4		
	2. Between foundation and framing for all walls	3		
DU 2.15	Insulate condensate discharge piping $\geq R-2$	1		
DU 2.16	Slope corrosion-resistant HVAC drain pan to drainage system	2		
DU 2.17	Additional dehumidification system:	Select one:		
	A. Humidistat or thermostad used with whole-house variable speed cooling system	3		
	B. Basement or sealed crawlspace system	2		
OPTIONAL AT ALL LEVELS				
DU 2.18	Slab or crawlspace vapor barrier ≥ 10 mil or reinforced	1		
DU 2.19	Wall cavity insulation without a vapor retarder or kraft paper	1		
DURABILITY AND MOISTURE MANAGEMENT TOTAL		0	0	

- Each category & subcategory broken up by when it is required
- Each line item has a number that corresponds to the guidelines
- Sub-items:
 - Numbered= additive
 - Lettered=either/or

Builder Responsibilities:

- Builder needs to download from EarthCraft.org website
- Builder needs to fill out
- Required before any work can be done by the Technical Advisor

Certified

- 100 points

Gold

- 150 points
- ENERGY STAR Certified

Platinum

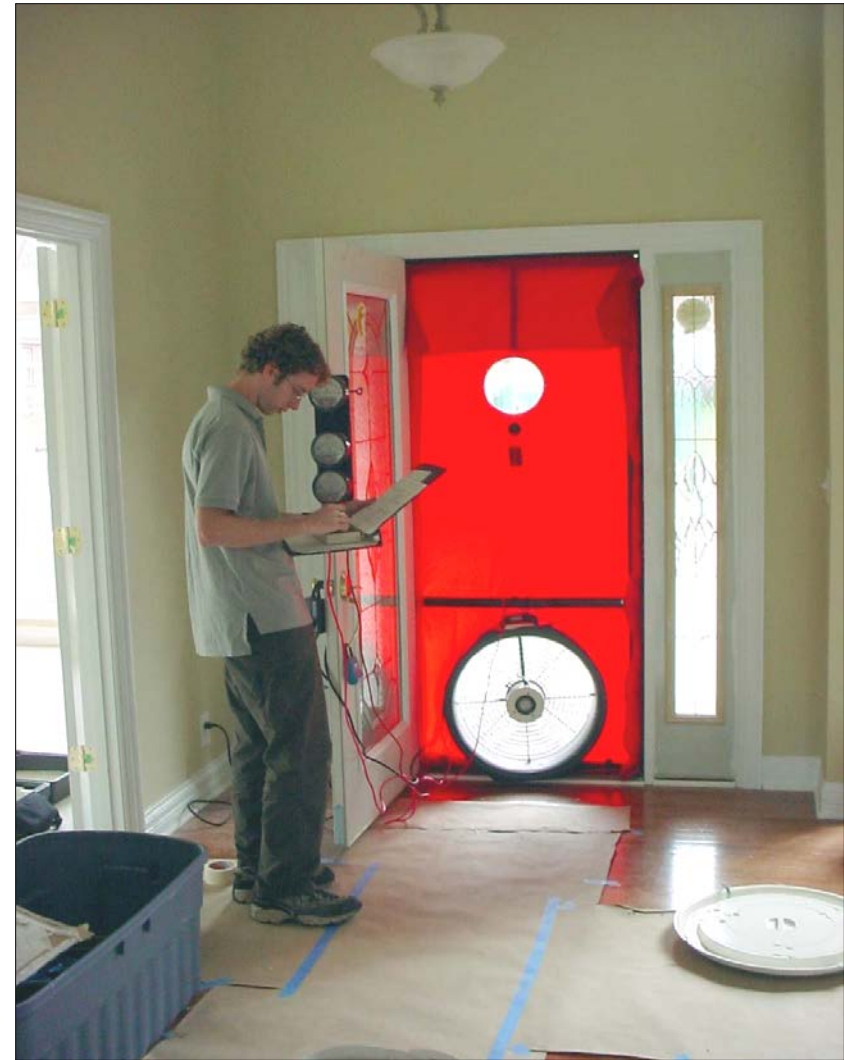
- 200 points
- ENERGY STAR Certified
- Indoor airPLUS
- WaterSense

No point minimums per category at any level

How EarthCraft House™ Works



Training
Design Review
Preliminary Inspections
Final Inspections



Categories and Subcategories



1. Site Planning
 - Site Selection
 - Site Design
 - Site Preparation and Preservation Measures
2. Construction Waste Management
3. Resource Efficiency
 - Resource Efficient Design
 - Advance Framing Products
 - Local, Recycled and/or Natural Content Materials
4. Durability and Moisture Management
 - Products and Applications
 - Moisture Management
5. Indoor Air Quality
 - Combustion Safety
 - Indoor Pollutant Control
6. High Performance Building Envelope
 - Air Sealing Measures
 - Blower Door Test Results
 - Insulation
 - Windows and Doors
 - Roof
7. Energy Efficient Systems
 - Heating and Cooling Equipment
 - Ductwork/Air Handler
 - Duct Leakage Test Results
 - Ventilation
 - Water Heater
 - Lighting/Appliances
8. Water Efficiency
 - Indoor Water Use
 - Outdoor Water Use
9. Education and Operations
 - Education
 - Operations and Management
 - Third Party Programs
10. Innovation

Scoring a House

12 categories

Minimum total of 150 points

Combination of energy efficiency and
environmentally responsible practices

Innovation encouraged





Certification standard for sustainable multifamily projects

Intended for low-rise projects with a maximum of 4 stories

Provides a marketing and permitting tool for developers and field support during construction

Provides a legitimate, third-party standard for buyers and other stakeholders

Scoring a Project

12 categories

Minimum total of 200 points

Combination of energy efficiency and
environmentally responsible practices

Innovation encouraged



Additional Program Integration

Third Party Programs



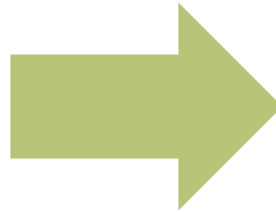


Qualified Allocation Plan (QAP)

2008 - ECC and LEED
ND added

2010 - 100% of the
projects funded are
pursuing green building!

Evolution of ECC



1999

2005

Project Types



[possible]



[preferred]

GREY AREA

OWNERSHIP

PHASED DEVELOPMENT

BOUNDARY LINES

Ownership



Boundaries

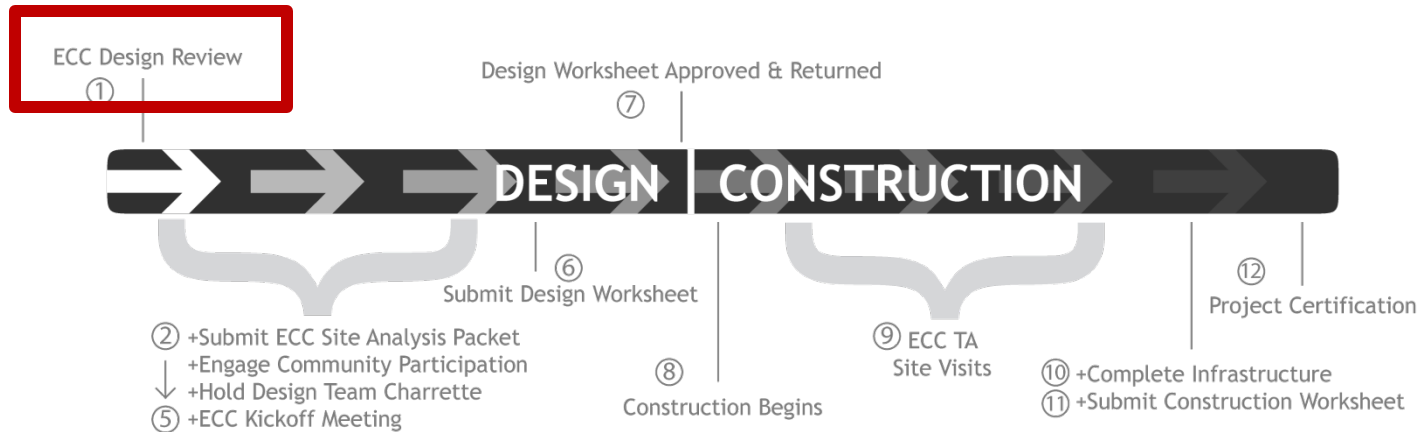


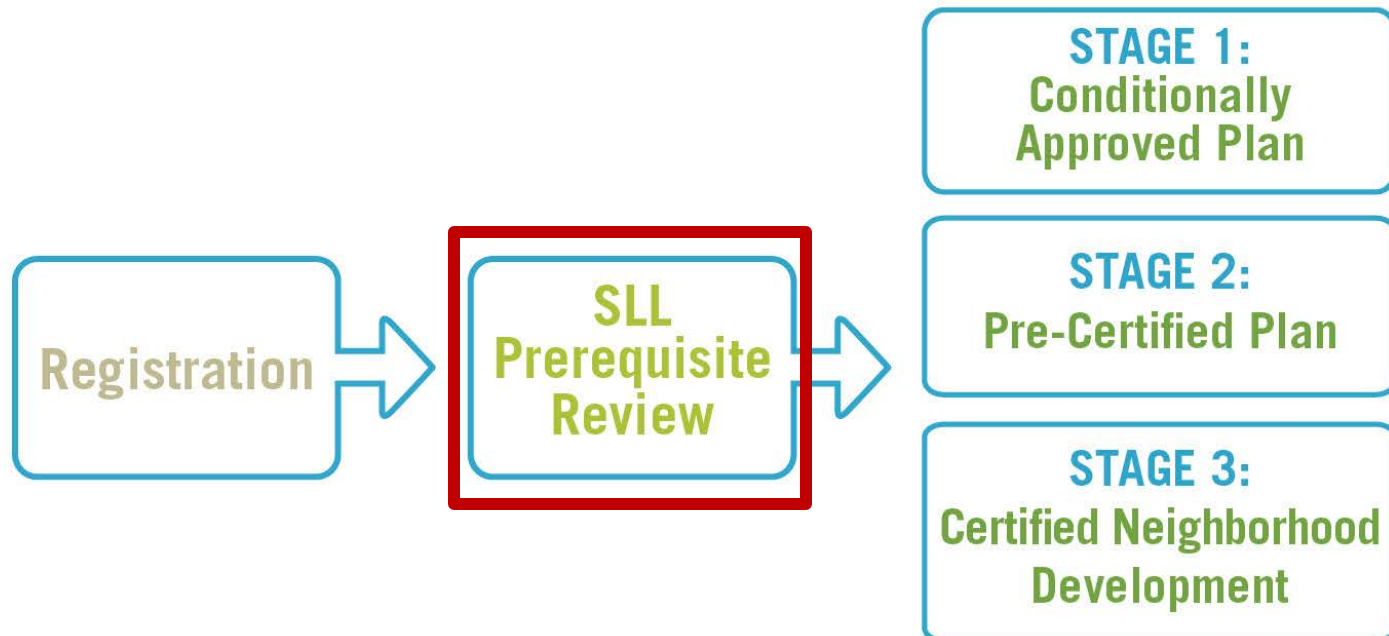
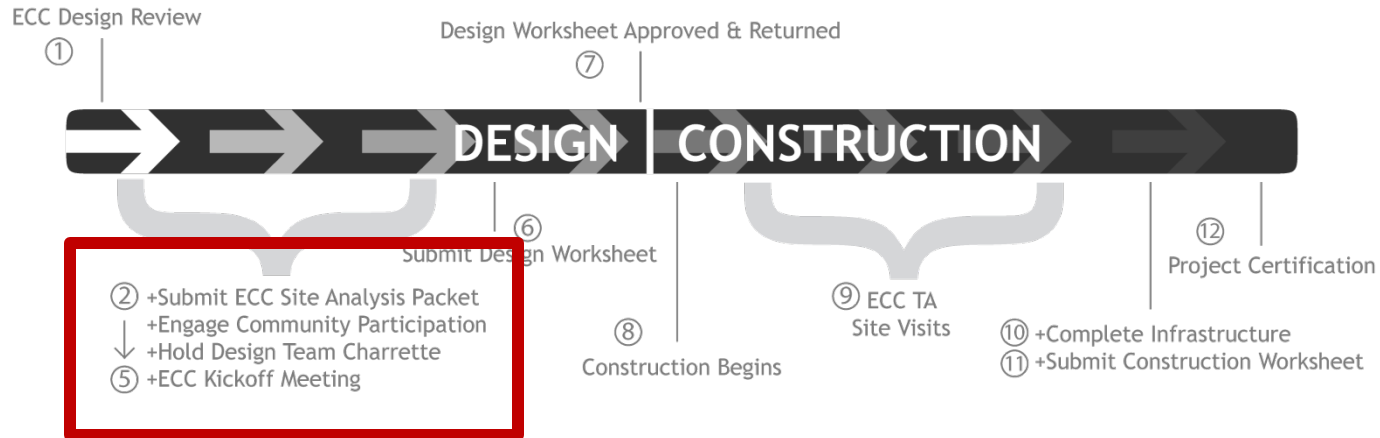
Phased Development



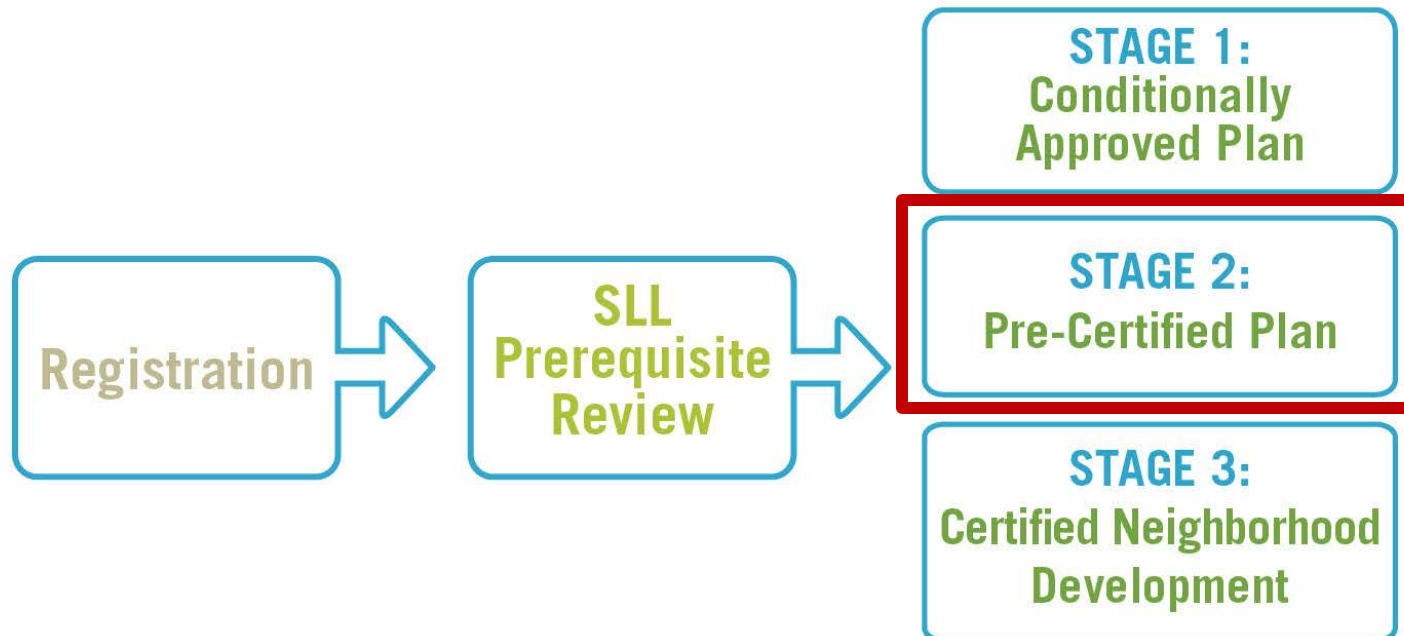
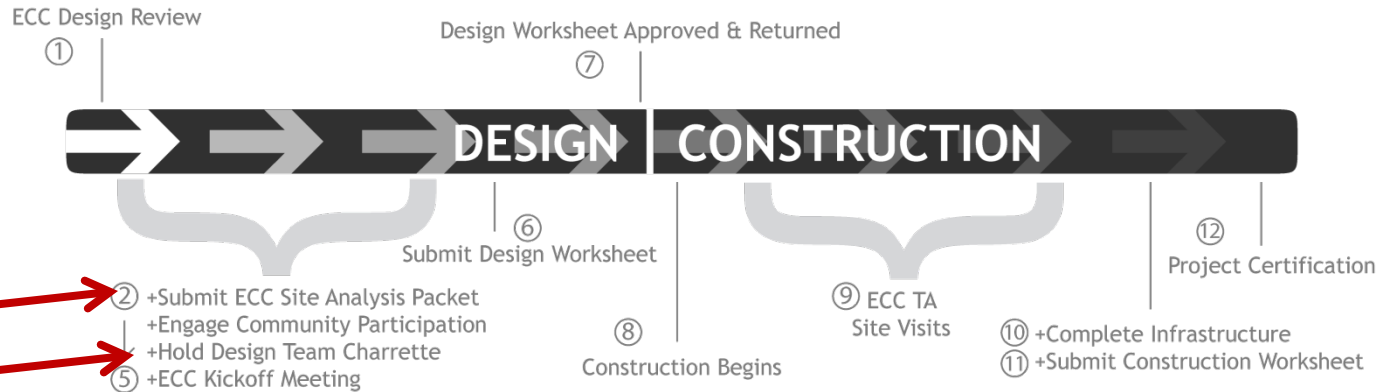


Prior to Submitting to DCA





Immediately After Funding is Awarded



Site Selection



Site Analysis



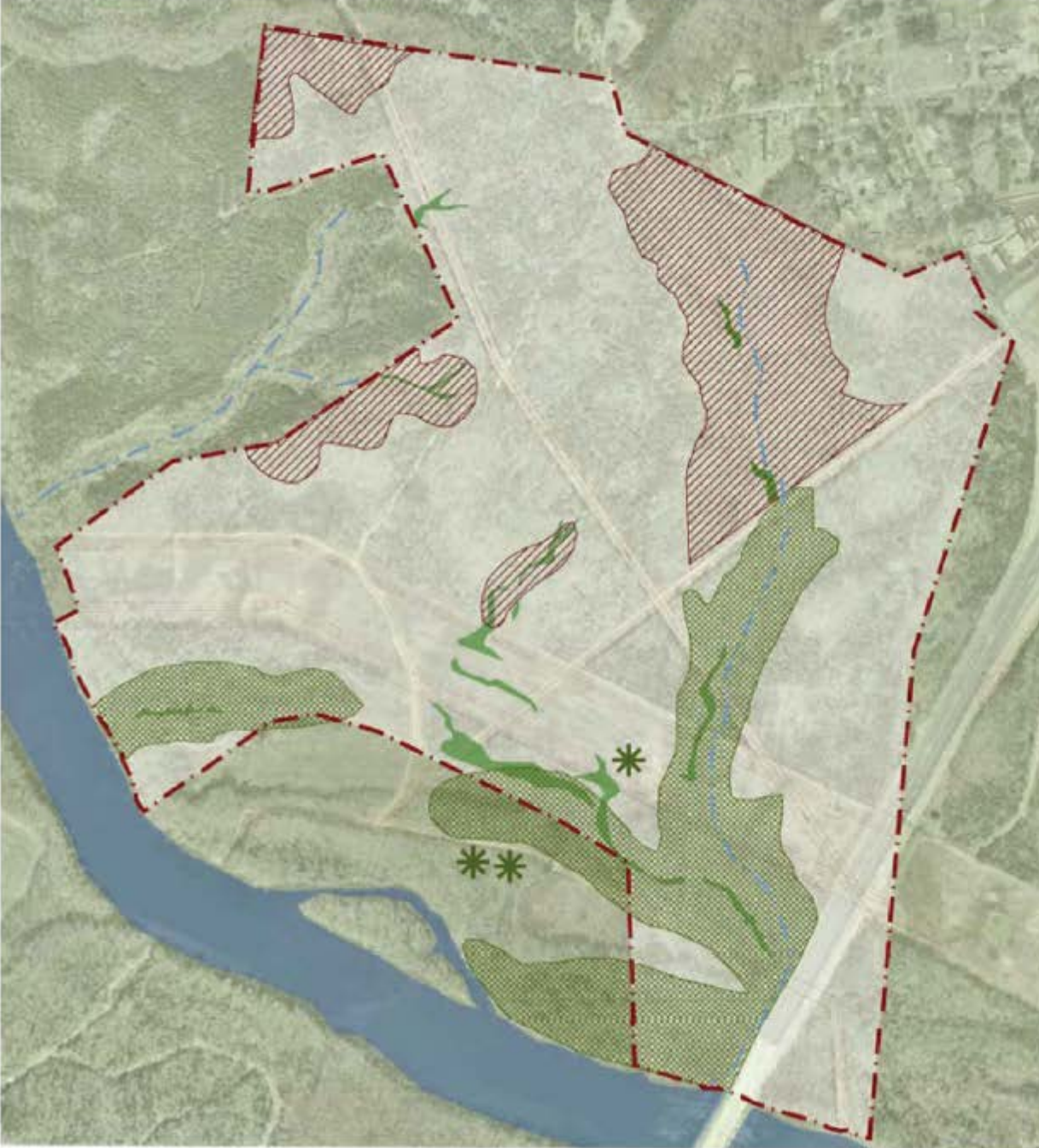
Wildlife Habitat

Sensitive Wildlife Map:

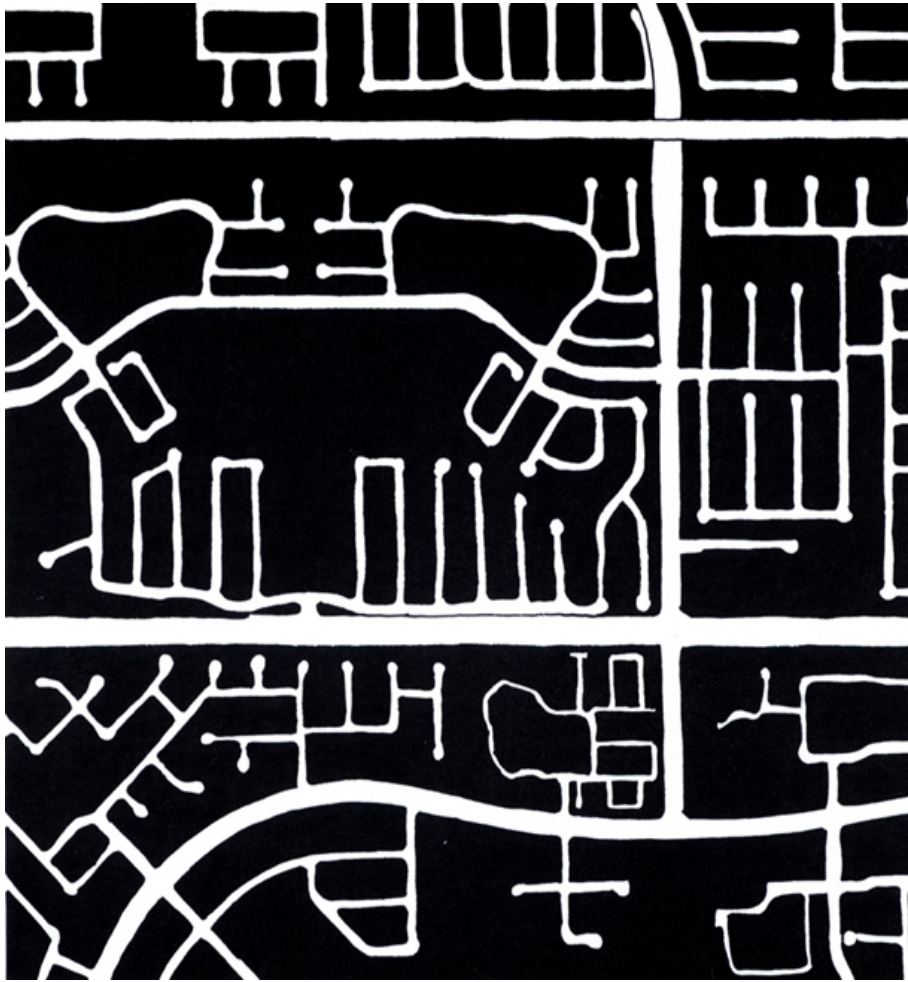
Consult with the state Natural Heritage Program or Fish and Wildlife Service (FWS) Division to determine the likelihood of federally threatened or endangered species existing on site.

If it is determined that species are likely to exist on site, hire a qualified biologist to conduct a site analysis and produce a habitat conservation plan per the Endangered Species Act.

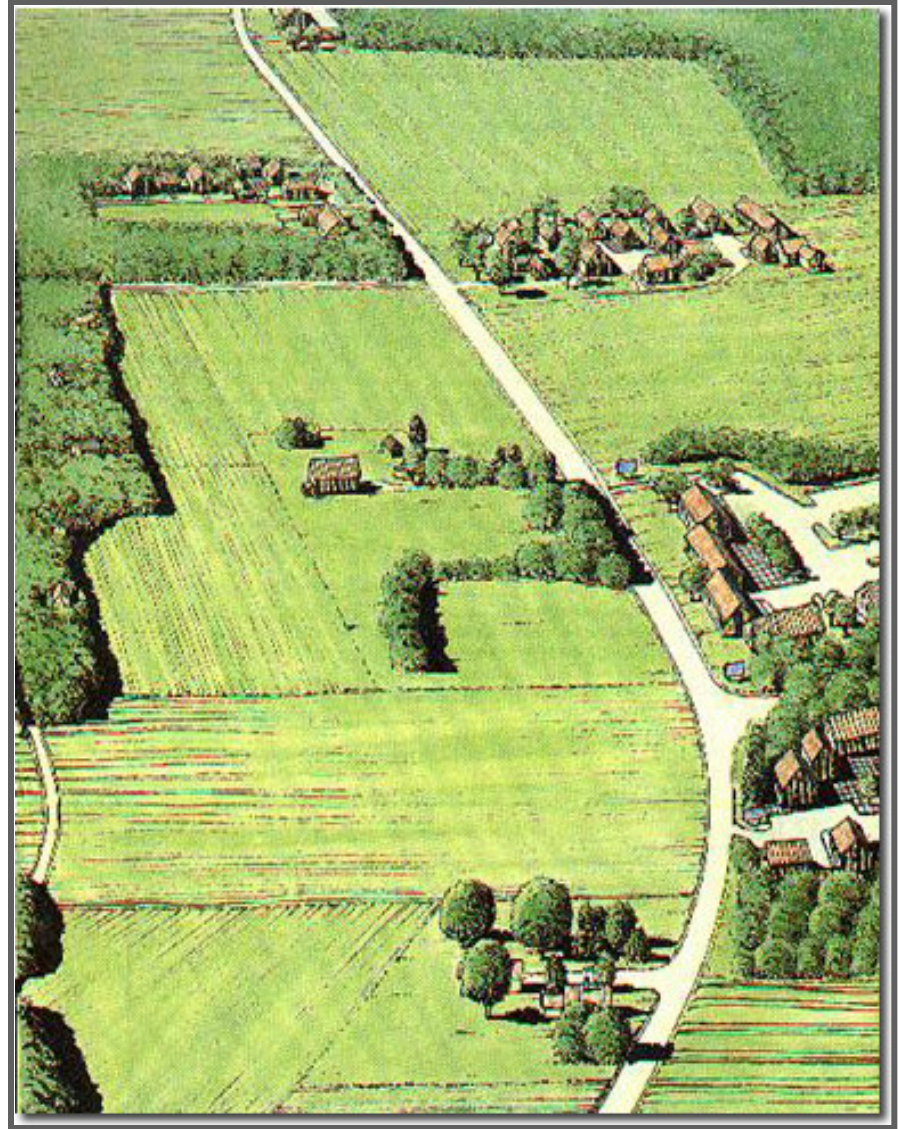
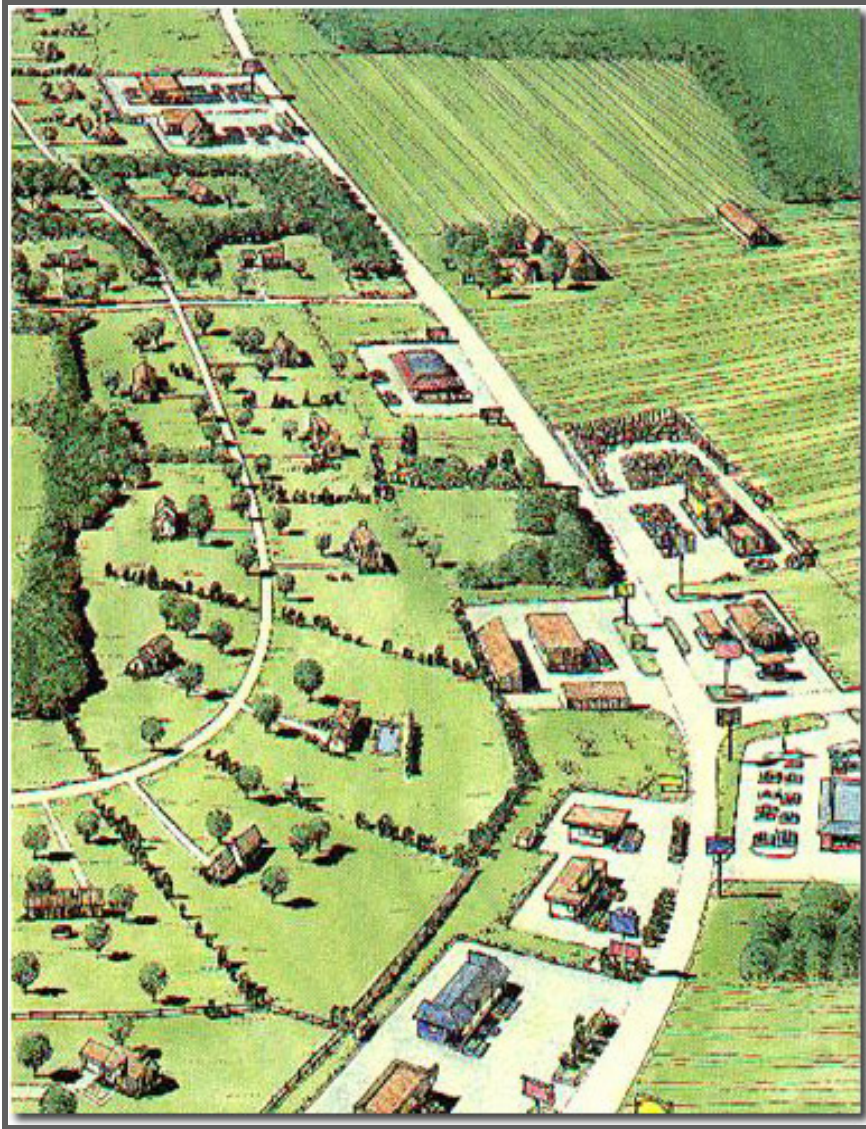
If it is determined that no federally threatened or endangered species exist on site, hire a qualified biologist, work with a conservation NGO, or work with a local or state agency to produce a map of any additional wildlife habitats found onsite.



Development Form



Development Form

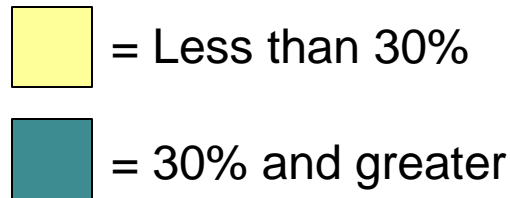
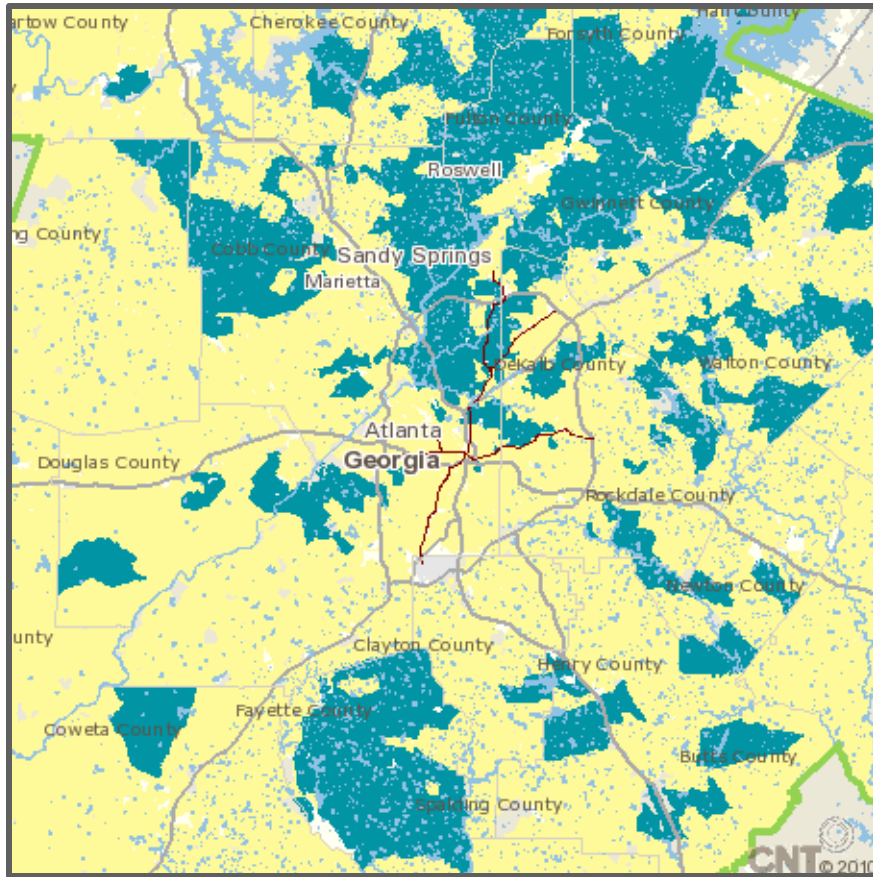


Development Form



Housing + Transportation Affordability Southface

Housing Costs- % Income



Housing + Transportation Costs- % Income

