

The Sustainable Louisiana House Checklist

Use this checklist to explore and select features and components of a sustainable house in Louisiana. Refer to the following Reference Guide for more

information about items on the checklist. Use the checklist again to evaluate the construction plans for your Louisiana house.

Common Abbreviations and Symbols used in the checklist:

(See Reference Guide for definitions of technical abbreviations and terms)

N	north	≤	less than or equal to	mph	miles per hour
S	south	>	more than	HVAC ...	heating, ventilation and air conditioning
E	east	≥	more than or equal to	SEER ...	Seasonal Energy Efficiency Ratio
W	west	%	percent	AFUE ...	Annual Fuel Utilization Efficiency
R	R-value	°	degrees	HSPF ...	Heating Season Performance Factor
MBR	master bedroom	ft. or ' ...	feet (unit of measure)	COP	Coefficient of Performance
BR	bedroom	in. or " ..	inches (unit of measure)	EER	Energy Efficiency Ratio
Ba	bathroom	/yr.	per year	EF	Energy Factor
La.	Louisiana	min.	minimum	BFE	base flood elevation
Ref.	Reference (as in Reference Guide)	max.	maximum		
<	less than	cfm	cubic feet per minute (rate of air flow)		



Resource-efficient

Energy-efficiency

ENERGY STAR Home

- Certified ENERGY STAR Home or
- Min. 86 points (five stars) on Louisiana's Home Energy Rating System (HERS)

Design for the climate

Landscaping for energy savings:

- Deciduous trees shade W, SW, E and SE sides of house
- Large shrubs or trellis with vines on W side
- Ground cover, mulch near house to reduce reflected heat
- Little unshaded pavement near house, none under windows
- Evergreen shrubs and trees grouped as windbreak on N side

Overall house design :

- Compact building layout to minimize total surface area

- Open planning, min. corridor area (space-efficient design)
- Kitchen, laundry rooms are not on W side
- Living areas, kitchen have N or S windows
- Porches, patios, etc. on N & S sides (unconditioned living space)

House design elements to minimize solar heat gain:

- More wall area faces within 20° of due S and N
- W facing glass <2% of floor area
- E facing glass < 3% of floor area
- 2-ft. or larger overhangs
- All W, E and S glass shaded
- Garage/carport on W or E side of house (blocking sun)
- No skylights (except light tubes)
- Reflective roofing (>50% solar reflectance)
- Light color brick or siding

Design elements for passive solar winter benefits:

- S overhangs sized or louvered for summer shade and winter sun
- Thermal mass flooring along S glass
- S facing sunroom with mass floor, walls

House design elements for mild seasons:

- Operable windows placed for cross ventilation
- Porch open on three sides or in breezeway

Windows

- ENERGY STAR or NFRC labeled windows, whole units rated at:
 - ≤ 0.40 SHGC (*solar heat gain coefficient*)
 - ≤ 0.30 AL; prefer 0.20 (*air leakage*)
 - ≤ 0.65 U-factor in S La.; ≤ 0.40 in N La. (heat conduction)
 - ≥ 0.50 VT (*visible light transmittance*)
- Or, spectrally selective, southern climate low-e, insulated units
- All W and E glass has ≤ 0.40 SHGC or shade screens
- If passive solar, S facing glass is high solar gain low-e
- For daylighting, 0.80 VT on N, and S if shaded

Tight construction (air sealing)

- Exterior air flow retarder - preferred for S La.
- Airtight Drywall Approach interior air flow retarder - preferred for N La.
- Sealed, airtight floor system
- All hidden bypasses sealed from attic and crawl space air
- Bottom plate of exterior walls sealed to foundation
- Band joists between floors sealed
- All penetrations in building envelope sealed
- Airtight electrical boxes (or sealed by hand)
- Low infiltration windows and doors
- Fireplace: sealed from attic, outside air duct, tight damper, glass doors
- Weatherstripped, insulated attic access (or in unconditioned area)
- No recessed lights, or only airtight IC type fixtures used
- Tight dampers, sealed housings on exhaust and inlet vents (exhaust not vented into attic)

Insulation systems with good “whole wall” R-values

- Continuous insulation surrounding all conditioned space (except slab floor)

Recommended Insulation Material R-values:

- Attic: R 30-38 in S La.; 38-49 in N La.
- Cathedral ceiling: R 30-38 in S La.; R 38 in N La.
- Wood frame walls: R 13-19 in S La.; R 18-19 in N La.
- Concrete or masonry walls: R 11-13 on interior side
- Band joist: R 30
- Floor over unconditioned space: R 13-19 in S La.; R 25 in N La.

Elements of Insulation System:

- Insulation installed without gaps, voids and compressions
- Radiant barrier under roof decking (if HVAC in attic or non reflective roofing)
- Building/insulation system with reduced thermal bridging
- Insulation type with extra advantages (see Ref. Guide)
- Roof framing allows full insulation over exterior walls
- Insulated window and door headers
- Insulated two-stud corners and T-walls
- Insulated attic access door (R 19)
- All insulated doors (R 5-15)
- All glass insulated; nonconductive framing

HVAC - Efficient cooling and heating

ENERGY STAR labeled cooling and heating equipment:

- Air conditioner: \geq SEER 13
- Gas furnace: \geq AFUE 0.90 (0.80 is cost effective in La.)
- Heat Pump (air source): \geq SEER 13, \geq HSPF 8.0
- Geothermal heat pump: \geq EER 14.1, COP \geq 3.3

Alternatives with special advantages (see Ref. Guide):

- Geothermal heat pump with water heating
- Variable speed air conditioner or heat pump
- Integrated gas space and water heating system
- Manual J sizing (not oversized > 10%)
- Sensible Heat Fraction ≤ 0.70 SHF (min. 30% dehumidification)
- Zoned heating/cooling (zone control system or multiple units)
- Programmable thermostats
- Outdoor thermostat on heat pump
- Heat pump has gas back-up
- Compressor on N or E side of house

Minimized duct losses:

- Ducts and air handler (AH) within conditioned space:
 - In sealed soffit or dropped ceiling, AH in closet
 - Or, in cathedralized (semi-conditioned) attic
 - Or, in insulated, sealed enclosure above ceiling
- Supply ducts, AH and connections sealed with mastic
- Duct insulation (\geq R 8 if not in conditioned space)
- Sealed return plenum or duct

- Manual D duct and return design
- Airflow measured and balanced
- Central supply trunk (not octopus layout)
- Duct runs and registers not extended to exterior walls
- Multiple returns, 1.5 in. door undercuts, transfer grilles or transoms for all BRs
- Tested duct leakage < 5% (if not in conditioned space)

Other Efficient HVAC equipment (see Healthy/IAQ for Ventilation):

- ENERGY STAR dehumidifier
- ENERGY STAR ceiling fans in often used areas
- ENERGY STAR quiet exhaust fans (≤ 1.5 sones)

Appliances with low life-cycle cost

- ENERGY STAR refrigerator, clothes washer, dishwasher
- ENERGY STAR electronics
- Efficient dryer, oven, etc. (compare EnergyGuide labels)
- If well or pool present, efficient pump

Efficient water-heating system options:

- Integrated with geothermal heat pump
- Heat recovery unit on air conditioner compressor
- Passive solar water heater, SRCC or FSEC certified
- Heat pump water heater (in attic or utility room)
- Tankless water heater
- >0.62 EF gas water heater
- >0.92 EF electric water heater
- Insulated hot water pipes
- Central location of water heater
- Water heater insulating jacket

Lighting with fewer watts, less heat

- high color fluorescent lighting throughout
 - tubes, electronic ballast in attractive built-ins
 - compact fluorescents
- high efficiency outdoor lighting
 - photovoltaic lights
 - outdoor fluorescents
 - high pressure sodium or metal halide
- controlled, diffuse daylighting
 - 0.8 VT N and shaded S glass
 - light tubes
- light color scheme interiors
- motion or photo sensors

Water-efficiency

- Drought-tolerant landscape (xeriscape)
- Micro-irrigation system for garden (or none needed)
- Low water lawn sprinkler system (or none needed)
- Timer on hose or watering system
- One-flush low flow toilets
- Low-flow plumbing fixtures, aerators
- Water-efficient appliances
- No oversized garden tub

In areas of threatened water supply:

- Automatic faucets
- Residential urinal
- Rainwater harvesting for outdoor use
- Greywater for underground irrigation (if permitted)
- Household sewage flow reduction system for irrigation

Waste management

Reduced construction site waste

- Modular planning
- Use of manufactured components
- Use of low-waste building systems
- Job site framing plan, cut list, central cut area
- Donation or re-use of excess materials
- Recycling of construction waste
- Cleared trees milled or ground into mulch

Household waste management

- Home recycling, sorting center (for household trash)
- Backyard composting

Pollution prevention and ecosystem protection

Water quality protection:

- Effective sanitary sewer system
- Private water well protected from flooding
- Landscape integrated pest management
- Backflow prevention valves on outside faucets

Storm water management/ runoff reduction:

- Porous paving
- Rainwater harvesting from roof
- Landscaped buffers, retention areas on site
- Construction sediment/erosion control

Minimized use of environmental hazards

- Suitable ozone friendly materials (no CFCs)
- Minimal use of pesticides, solvents, etc.
- Low toxic wood treatments
- Catalytic wood stove (if used for heating)

Native plant and ecosystem protection

- Onsite preservation of native trees, plants
- Protection of tree root system
- Landscaping with native plants
- Preserved or created wetland
- Preserved or created wildlife habitat

Favoring green, renewable and local resources

Suitable green materials

- Engineered lumber, framing systems, trim
- Concrete made with fly ash
- Recycled plastic or composite decking
- Recycled content building, finish materials
- Materials made from waste (mulch, bagasse, etc.)
- Salvaged materials

Site choice

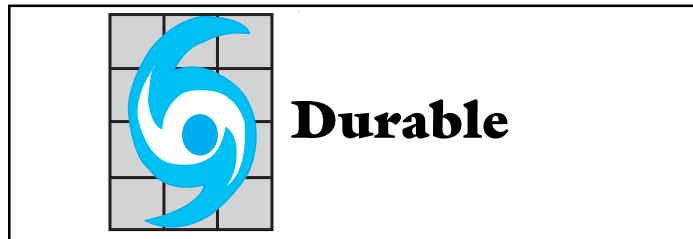
- Lot within "green" development
- Site near workplace or mass transportation
- Infill site or small lot development

Shift toward renewable or zero energy

- Passive solar (house design, water heating)
- Fuel cell (when cost-effective)
- Photovoltaics (partial, where cost-effective)

Use of local resources

- Local renewable natural resources
- Locally manufactured products (<200 miles)



Decay resistance

Moisture control

Architectural detailing that sheds rainwater away from walls:

- Overhangs all around (≥ 2 ft. wide)
- Roof pitch between 3:12 and 6:12
- Roof drip edge
- If lacking overhangs, non-clogging gutters or diffusers
- Covered entries
- Cap flashing with drip edges above windows, doors
- Extended, sloped window sills
- Sloped porches, balconies, driveways, etc.

Roof leak reduction:

- Simple roof design
- No flat roofs
- Properly installed flashing at penetrations, valleys
- Step and kickout flashings if a roof intersects a wall
- Higher performance underlayment for leak-prone roofing types

Continuous drainage plane in walls exposed to rain:

- Rain screen system* (with drainage space) in high rainfall areas
- Pressure moderated rain screen system* (with vented space) in extreme rainfall areas
- Or, face sealed reservoir system (masonry construction)
- Flashing of windows, doors, etc. that continues drainage plane
 - Shingle fashion installation of materials
 - Flexible flashing wrap, membrane or coating corner protection
 - Doors set in pan flashing or "seat" in slab

Hot, humid climate ideal wall assembly (south La.):

- Air flow retarder to the exterior
- Vapor diffusion retarder to the exterior, if used
- Permeable interior finish (no vinyl wallpaper)
- Unfaced cavity insulation

Mixed, humid climate ideal wall assembly (north La.):

- Air flow retarder to the interior
- Permeable interior finish (no vinyl wallpaper)
- Vapor diffusion retarder (not vapor barrier) that adapts to seasons:
 - $\geq R-5$ insulating foam sheathing or foam core
 - Kraft paper faced insulation to interior

Water managed foundation:

- Ground slopes away from foundation
- Gasket (capillary break) between foundation and framing

For slab on grade house:

- Plastic sheeting under slab and around grade beam
- Coarse gravel drainage bed under slab

For raised house:

- Ground level inside crawl space higher than outside
- Rigid insulation under floor joists (fire-rated, seams taped)
- Plastic ground cover in enclosed crawl space
- Drainage tile at footing
- Drainage board for any below grade walls

Other:

- Exhaust fans, clothes dryer do not vent under house or into attic
- Wood, fiber cement siding backprimed
- No plumbing within exterior walls
- Stainless steel hoses for clothes washer
- Sloped floor and drain near clothes washer, water heater
- Air infiltration control (see Energy-efficiency section)
- Humidity control system (see Healthy/ Indoor Air section)

Long-lasting Materials and Equipment

- ≥ 30-year roofing warranty
- 40-year cladding warranty or masonry
- ≥ 10-year window glazing warranty
- pressure-treated wood, masonry, steel structural components
- fiber cement, plastic fiber composite or other long-life trim
- plastic lumber or pressure-treated wood decking
- appliances, equipment with longer than average warranties
- long-lasting floorings
- foundation designed for soil conditions

Multi-hazard resistance

Flood damage reduction

Built above anticipated flood levels:

In non-coastal A zones, floor is above BFE using one of these foundation types:

- slab on engineered fill (2 ft. max.), under footprint only
- slab on fill placed within a stem wall
- unfinished, floodable crawl space
- pile, post, column or pier foundation; enclosures designed to flood

In V zones and coastal-A zones, lowest horizontal structural member is above BFE with:

- Continuous pile, open foundation
- Free of obstruction or minimal obstruction as allowed by local ordinance

In areas of minimal risk (Zones C and X) near A or V zone property:

- Lowest floor is at BFE for nearest higher risk zone

Additional design features:

- Decks, porches built and anchored to resist flood forces
- Garage floor, patios, etc. min. 4 in. below living floor
- HVAC, electrical, mechanical systems elevated

Additional flood protection features:

- Backflow valve in sewer line
- Flood-resistant materials on first floor, as practical
- Appliance styles, installations that minimize damage in shallow floods

Hurricane and tornado resistance

(Items in italics reflect *Fortified...for safer living* guidelines for hurricane or tornado zones.)

General features:

- House is < 60 ft. long or wide*
- No more than two stories (levels)*
- Wall height of each story is < 10 ft.*
- Reinforced safe-room within house
- Storm storage for outdoor items
- Outside accessories securely anchored

Wall strength:

For standard wood frame construction:

- Wall studs spaced 16 in. on center*
- Walls anchored to foundation (4-ft. spacing)*
- Upper story strapped to lower story*
- Structural sheathing at corners and at ends of garage opening*
- Shearwalls sheathed min. 50% of wall length*
- Completely sheathed in very high wind zones*

For masonry construction:

- Rebar connects foundation to wall (≤ 4-ft. spacing)*
- Vertical rebar at corners and sides of windows, doors*

For OVE (2x6 24-inch spacing), SIPS, ICF and other building systems:

- Engineered for ≥ 130 mph (3 sec. gust) wind speed or local wind zone*

Roof, Overhangs and Attachments:

- Hurricane strapping or rebar connect roof to walls (plus walls to foundation)*
- Hip roof (preferred)
- Gable end walls braced*
- Attic vents protected*
- Roof deck 19/32 in. thick*
- In tornado zone, 5/8-inch plywood roof decking*

- Roof deck joints sealed
- Roof deck sufficiently fastened with screws or similar (no staples)
- Roof deck bonded to rafters with adhesive
- Min. #30 roofing felt, or equivalent
- Hurricane zone certified roofing, properly installed
- Overhangs engineered for area wind design load
- Porch, deck, carport designed and anchored to resist wind damage

Windows and doors:

- Windows and doors are impact resistant or protected by certified storm shutters
- In tornado zone, passive window protection (impact resistant)
- Impact and hurricane rated garage door

Fire protection

- Fire resistant cladding and roofing (Class A)
- Smoke alarm (combination type, battery powered)
- Lightning rod and grounding system
- Residential sprinkler system
- Planned extinguisher mounting locations

Hail and freeze hazards

- Hail resistant roofing (UL Class 4)
- No plumbing in vented attic
- All plumbing in heated space or well insulated
- Pressure relief exterior faucets

Termite resistance

- No untreated wood in soil contact
- Best: no untreated structural wood or vulnerable insulation
 - Borate-treated wood (interior), cellulose insulation, foams
 - Composite lumber or pressure-treated wood decking
 - Masonry, concrete or steel construction (if other criteria met)
- Professional soil treatment under foundation

Slab on grade foundation:

- Monolithic poured slab
- Slab engineered for soil type to prevent cracking
- Steel mesh sealed slab plumbing holes, joints
- No wood forms, stakes, etc. left in ground

Raised foundations:

- No hollow concrete blocks below grade
- Hollow block foundation walls capped with concrete

- Any piers are solid, resistant material
- Floor joists >18 in. above ground

All foundations:

- No foam insulation under ground (below grade)
- Min. 8-in. clearance between siding and finished grade
- Min. 6-in. clearance between wooden steps and soil
- Foundations detailed for ease of inspection and detection
- Termite shields to force termite exposure
- Porches, terraces not filled with soil
- Porch supports separated from house min. 2 in.

Other:

- Water managed building system (See Durable/Moisture Control section)
- Downspouts, sprinklers, drain lines discharge >2 ft. from house
- Plantings placed min. 3 feet from foundation
- Termite-resistant mulch near house
- Plumbing and conduit off the ground, no wood supports



Good indoor air quality

Control of mold, dust mites, other biological pollutants

- Moisture control construction methods (see Durable section)
- Air infiltration control (See Energy-efficiency section)

Ventilation and dehumidification:

- Right-sized, low SHF air conditioner
- Controlled fresh air AND dehumidification system to maintain RH < 60% and slight positive pressure:
 - Dehumidifying supply ventilation system, OR
 - Fresh air duct to return system with auto flow controller
 - Plus separate dehumidifier
 - Or, variable speed air conditioner

- Sealed duct system
- No attic power vent
- 50 cfm bathroom exhaust fans with timer or humidistat
- 100-150 cfm range/cooktop hood exhaust
- Pleated HVAC filter (≥ 7 MERV rating)

For households with allergies:

- Central vacuum system, or HEPA portable vacuum
- 10-12 MERV HVAC filter
- No carpeting or limited carpet of treated wool or olefin fibers
- Non-upholstered furniture
- Planned outdoor space for pets

Control of combustion pollutants

- Carport or detached garage
- Or, attached garage tightly air sealed from living space
- No living space above garage
- Garage attic isolated from home attic
- No unvented combustion
- Carbon monoxide detector

Protection from backdrafting:

- Only direct vent, sealed combustion inside house
- Bedroom return-air options
- Dampered air intake in laundry room (or window)

Control of other indoor pollutants

- Integrated pest management
- Low VOC paints, stains, sealants, adhesives, etc.
- No exposed formaldehyde materials (or sealed)
- Low emission labeled carpet, aired before installation
- No lead-based products used
- Modern mud room at family entry (shoe bins)
- Radon home test
- Soil gas prevention plan

Universal design

Safe, functional throughout lifecycle; accommodates various ages, heights, needs, abilities and changes.

Visitability by persons with disabilities

- A grade level or ramped entry path and doorway
- No steps into visiting areas and one bathroom
- Min. 32 in. wide doorways to visiting areas
- One accessible bathroom (5-ft. turning circle at toilet and sink)

Universal features

Throughout house:

- No level changes on first story
- Thresholds $< 1/2$ inch high
- All doorways ≥ 32 in. wide
- Hallways, paths ≥ 42 in. wide
- Lower switches (38-48 in. high)
- Higher outlets (18 in. high)
- Rocker switches or motion sensors
- Lever door handles, U-shaped cabinet pulls
- Single-lever faucet controls
- Easy to reach A/C filter
- Adjustable shelves, rods
- Rounded counter and cabinet corners
- Non-skid, even flooring
- Contrasting color and texture visual aids
- Ample, variable light without glare, task lighting
- Space planned for “just in case” elevator shaft, if two-story

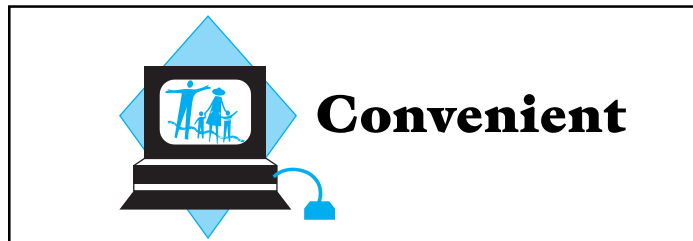
Kitchen and Laundry - adaptable and convenient for various users:

- Appliances placed for safety and universal access
 - Microwave at counter height (36 in.)
 - Front-loading washer
 - Cooktop controls at side
- 42-inch pathway clearances
- 5 ft. clear turning circle at sink, range, refrigerator
- Varied counter heights
- Seated work space in kitchen (30-32 in. high)
- No center stile on cabinets where knee space could be needed
- Some outlets, switches on sides of cabinets
- Pull-out shelves, baskets, drawers; easy storage access

One bedroom and bathroom more fully wheelchair accessible:

- On ground floor
- 36 in. wide doorways, no thresholds
- ≥ 24 in. space on latch side of doors
- Doors open out
- 5 ft. turning circle clear floor spaces
- Independent entrance to a bedroom
- Low windows and mirrors (max. 40 in. above floor)
- No deep pile carpet or slick, shiny flooring
- Sink knee space
- Reinforced bathroom walls at toilet, tub, shower
- Non-slip decorative grab bars

- Higher toilet, accessible (not enclosed)
- Easy-transfer shower and/or tub with seat or roll-in
- Single-lever bath valve, mounted near bath entry
- Higher cabinet toe space (9 in.)
- Easily adaptable to changing needs



Convenient

Functional floor plan

(See also Healthy/Universal Design section)

- Abundant, adaptable storage space in every room
- Sufficient, secure storage for outdoor items
- Family entry nook for electronics, mail, gear, shoes, etc.
- Consider cathedralized storage attic
- Controlled visitor entrance, access and view
- MBR on same level as second BR
- Efficient workflows, traffic paths
- Sound controls

Kitchen:

- Service entry (from car) convenient to kitchen
- Accommodates multiple cooks
- Accommodates social interaction
- Layout follows space guidelines (see Ref. Guide)
- Work triangle perimeter within 15-26 ft.

Low maintenance, outside and inside

- Materials that need infrequent or no refinishing

- Mildew- and algae-resistant materials
- Scratch- and stain-resistant materials, finishes
- Easy to clean surfaces, appliances, etc.
- Min. dust collecting surfaces
- Space at entry for shoes, outerwear

Advanced wiring, for information technology:

- Structured wiring, wide bandwidth
- Easily upgradeable
- Integrated multi-hazard and security systems
- Energy-management system
- Home office equipped for telecommuting
- Networking

Adaptable spaces and systems for changing user needs

- Open planning of social zone
- Multi-purpose rooms
- Usable attic space
- Expandable floor plan (future additions)
- Tandem rooms with removable partitions



Practical

See the end of the Reference Guide for comparisons of specific building systems.

- Life-cycle cost-effective systems, products
- Locally available or easily obtained products, installers, maintenance
- Reduces labor cost or construction time (financing cost)
- Enhances or protects market value

NOTES