

FLORIDA HOUSE LEARNING CENTER AS-BUILT SPECIFICATIONS

A public-private partnership of

The Cooperative Extension Service for Sarasota County, the Florida House Institute for Sustainable Development, the Sarasota County Technical Institute, and the Southwest Florida Water Management District.

DESIGN 1550± square feet of air-conditioned living space in the main house
OVERVIEW: 825± square feet of porches/lanais with sliding glass doors for indoor/outdoor spaces
(The East Side Lanai has been enclosed for display purposes.)
400± square feet of garage/flex space
Passive solar orientation of home on the lot with the long sides facing North and South
Minimal windows on east and west sides of home to reduce solar gain in summer
4-foot overhangs to shade windows and walls to reduce solar gain
Rooftop cupola with high clerestory windows to allow hot air and moisture to move up and out
Interior and exterior transom windows to promote air movement, even with doors closed
10-foot high ceilings with ceiling fans mounted at 8-foot height

“MODEL FLORIDA YARD” demonstrates the use of native plants, Xeriscaping, edible landscaping, micro-irrigation, composting and recycled mulch, as well as the reduced use of fertilizers, pesticides, water and energy, and reduction of detrimental run-off into our waterways. Micro-irrigation, recycled mulch and 90%+ native plants save water in the landscape.

FOUNDATION: Reinforced concrete footings/monolithic slab

SUB-FLOOR RADON VENTILATION SYSTEM (stubbed out): Series of three excavated, 5-gallon-sized drywells at the middle and near each end of the house below the slab, connected with recycled plastic mesh and 2” PVC pipe risers, stubbed out in the attic, for future upward venting by fans if radon is detected.

SUB-FLOOR VAPOR BARRIER: Two layers of 10-mil polyethylene, installed with staggered and double-taped joints under the slab and over the sub-floor radon system, for moisture and radon barrier.

FLOOR SYSTEM:

- Ground Floor Slab: 4” concrete (3000 P.S.I.) steel-reinforced slab, cured 7 days, with sodium silicate (water glass) applied on the top surface of the slab to slow down the drying time and to reduce cracking.
- Termite Shield: 16-gauge galvanized steel sheets applied to perimeter of slab completely under the exterior wood wall to inhibit termite infestation and to make their attempts more visible.
- Floor Finishes:
 - Decking: Two different brands of wood-polymer composite decking, at parking lot platform and front deck, made of recycled plastic and wood fiber installed with deck screws over pressure-treated lumber framing. Rear deck features vinyl deck cover for protection from CCA pressure-treated lumber decks.
 - Porches: 8” x 8” abrasive tile made of 70% recycled glass (50-60% from automobile glass).
 - Great Room: 12” x 12” ceramic tile (Tile floors applied directly to the floor slab allow for the thermal storage of energy).
 - Master BR: Conventional and Strand-Woven (engineered) Bamboo floors (3-5 yrs to harvest)
 - Master Bath: -Cork (Renewable: harvested from bark of cork tree. Regrows in 9-12 years.)
-Almendro/Teak (Forestry Stewardship Council Certified/sustainably harvested)
 - Master Closet: Palmwood (Old plantation-grown coconut palms no longer bearing fruit)
 - Bedroom 2: Pile carpet made of 100% recycled plastic bottles.
 - Guest Bath: Linoleum made from all natural materials of cork, jute, linseed oil, and wood flour. (Anti-static, biodegradable, bacteriostatic = micro-organisms do not thrive easily)

WALL SYSTEM:

- Framing: Interior studs are 2 x 4's of laminated strand lumber (16" on center) made from 8-10-year-old, fast-growing, soft-wooded trees.

Exterior, plumbing, and bearing walls are 2 x 6's of laminated strand lumber (16" on center) with cedar base plates below the vertical studs.
- Sheathing: 1/8" foil-faced, recycled cardboard, structural sheathing.
- Siding: Oriented strand board made of wood chips molded in resin, machine-primed and hand-painted with a top coat of exterior latex (low in volatile organic compounds=VOCs)
- Porch Ceilings: Textured acrylic coating applied over exterior-rated gypsum board
- Interior Finishes: 1/2" drywall on all walls
1/2" moisture-resistant drywall in both bathrooms
Low-VOC latex paint on walls and ceilings
Florida Yellow Pine with white "pickled" finish on ceiling of Great Room (locally grown)
Spruce kitchen cabinets with white "pickled" finish of watered-down latex paint
Paper Wallpaper in Master Bathroom (Vinyl papers can off-gas toxins and create a vapor barrier, trapping water inside the wall---leading to mold.)
Poplar wood trim baseboards
Wall tiles in Kitchen and Master Bathroom shower contain 30% recycled co-mingled glass. Hand-painted designs on kitchen tiles.
- Windows: Interior single-glaze transom windows with 50%+ recycled aluminum frames.
Exterior single-glaze awning windows and screens of 50%+ recycled aluminum frames.
Removable interior "storm" windows in Office and Guest Bath minimize energy use by stopping air leaks and filtering UV rays. They also reduce noise and dust infiltration.
- Doors: Interior doors of hollow-core, raised-panel or louvered, solid wood.
Exterior, double-glaze, sliding glass pocket doors of 50%+ recycled aluminum frames.
Exterior screen doors and lower railings made of 100% recycled aluminum frames.
French doors to garage/flex space are double-glaze fiberglass, insulated.
- Closets: Shelving of epoxy-baked enamel that does not off-gas toxins or become "gummy".

ROOFING SYSTEM:

- Trusses: Pre-engineered, southern pinewood, 24" on center.
- Roof Deck: 1/2" OSB = oriented strand board (composite of wood chips and resin)
- Radiant Barriers: Silver-colored, low-emissivity coating sprayed on underside of roof deck in main house. Foil-faced paper stapled to bottom of top chord of trusses in garage area.
- Metal roof system: 5-V crimp of sheet steel, coated with an aluminum and zinc combination. (Zinc helps prevent mildew.) Panels are installed using zinc-aluminum-coated steel screws with neoprene washers, over a dry-in membrane.
- Gutters/downspouts: Custom-crafted of same material as metal roof (see above).
- Soffit and ridge vent: Perforated aluminum, vented soffit with cedar fascia and aluminum ridge vent

ELECTRICAL SYSTEM:

- 200 AMP service with circuit breaker panel in garage/office.
- Copper wiring (National Electrical Code standard).
- Hard-wired, radiation-free smoke detectors with battery back-up.
- Ground Fault Interruption receptacles (GFI's at Kitchen, baths and porches—Code Standard).
- Guest Bedroom is wired with 12-Volt, Direct Current electricity, generated by two photovoltaic modules mounted on the south side of the upper roof. Ceiling fan, closet light and outlets all operate on 12-volt DC. An inverter to change 12-volt DC to 115-volt AC can be plugged into the wall outlets in order to use small conventional equipment such as TV. The current generated in the roof modules is stored in four batteries that are located in the closet along with the control and distribution center.

HEATING / COOLING SYSTEM:

- Main house has a 2½-ton heat pump with scroll-type compressor with a SEER (Seasonal Energy Efficiency Ratio) of 18 and 10 KW electric resistance back-up heat strip.
 - Variable speed blower motor
 - 2-Stage Condenser
 - A passive, Heat Pipe Dehumidifier, installed within the air-handler's supply and return ducts, removes an additional 15% of moisture to reduce cooling costs.
- Flex space/garage has a 1½-ton heat pump with scroll-type compressor with 12 SEER rating and 5 KW back up. (Space is used for offices)
- Both heat pumps have:
 - Programmable Thermostats
 - Air Handlers located in conditioned space
 - Insulated, round, metal ducts with mastic seal at joints

PASSIVE VENTILATION SYSTEMS:

- Natural cross-ventilation of rooms by passive design with 90% of openings on north and south sides in an approximate 50/50 ratio, to take advantage of the prevailing southerly breezes.
- Transom windows above interior and exterior doorways provide natural ventilation even when the doors must be closed for privacy or security.
- Awning windows in cupola are operable to allow warm, moist air to rise up and flow out of the house.
- Metal ridge vent and perforated aluminum soffit vent the attic area.

ACTIVE VENTILATION SYSTEMS:

- 22" Whole-House ventilating fan exhausts to attic area using 500 watts per hour on high speed.
- Reversible 52" ceiling fans are installed in every room, with two in the Great Room, on rods at 8-foot level for maximum ventilating effect.

INSULATION SYSTEMS:

- Attic Floor: Blown Cellulose (R-30)
- Attic Ceiling: Radiant Barriers=Foil-lined paper (over garage/office) and spray-applied (main house)
- Walls: 3 ½" Fiberglass Batts in 2 x 4 stud spaces (R-13)
6" Fiberglass Batts in 2 x 6 stud spaces (R-21)

LIGHTING:

- Compact fluorescent bulbs in interior lamps, ceiling and wall fixtures, exterior pole lights & flood lights, which have timers.
- 4-foot, high-efficiency "T-8" fluorescent tubes with electronic ballasts in Great Room and Hall Bath valances, and in cove lights in the Master Bath.
- High-efficiency, full-spectrum fluorescent tubes with electronic ballasts for countertop task lighting in kitchen (under top cabinets).
- Tubular Skylights are installed in Guest Bedroom, Master Bedroom closet, Master Bath shower, Laundry Room and Exhibit Room. They use reflective, mirrored tubing to deliver natural light with little or no solar heat gain. Master Bath shower skylight includes exhaust fan option and artificial light for night time use. Exhibit Room skylight includes a "dimmer" option, which allows the light to be closed off at the touch of a switch. Any desired light level can be achieved using this control.

SOLAR SYSTEMS:

- Passive Solar Water Heating: Passive "Batch" solar water heating panel holds 40 gallons on the roof. It is coupled with a conventional, interior 40-gallon electric water heater for additional storage and back-up. There is no pump and there are no moving parts. The water pressure coming into the house moves water from the panel to the tank as it is used.
- Active Solar Electricity: This nominal 12-Volt system consists of 24 square feet of photovoltaic modules (panels) with an output of 240 watts at 17 Volts. Lead/Acid Gel storage batteries and a control/distribution box are located in the closet of the Guest Bedroom. The ceiling fan, closet light, TV and all wall outlets in this room are wired with #12 copper wire, and a small inverter can be plugged in to any outlet to allow conventional 115 Volt AC equipment to be used.

PLUMBING:

- .5 - 1.5 GPM low-flow aerators on all faucets.
- 2.5 GPM low-flow aerators on showerheads in both baths. Showerheads contain de-chlorinating, replaceable filter cartridges, which also remove dirt, sediment, heavy metals, and odors from the water.
- Dual Flush toilet in Hall Bath uses only .8 gallon for liquid flushes and 1.6 gallons for solid flushes.
- Flapperless toilet in Master Bath uses 1.6-gallons and eliminates flapper leaking problems, which waste the most water. Both toilets use cistern water for flushing.
- Clothes Washer uses cistern water.
- Demonstration graywater system funnels the used water from the Clothes Washer and laundry sink to a separate drain field of perforated 4" flexible tubing under the banana trees for irrigation.
- Metlund Hot Water D'Mand System in Master Bath recirculates water at the touch of a button through a closed-loop system to bring hot water to the bathroom without turning on the faucet and wasting water.
- Water purification system on Kitchen sink uses a thin-film-composite, reverse osmosis membrane to filter out heavy metals and dissolved solids; a ceramic and carbon-block filter to remove bacteria, organic chemicals and chlorine; and a 10-micron sediment and carbon filter to remove dirt, rust, sediment and additional chemicals.

CISTERNS:

- Two 2,500 gallon cisterns, one on the east and one on the west side of the house, both equipped with clean-out drains, view glasses to monitor water level, and overflow drains connected to seasonal wetland. ½ HP pump and 20-gallon pressure tank.
- East cistern constructed of sprayed lightweight concrete (similar to swimming pools) with a fiberglass-coated liner and a metal roof.
- West cistern constructed of concrete block reinforced with poured cores with a liner of flexible, waterproof, acrylic coating and a metal roof.

KITCHEN:

All appliances are **Energy Star®** rated for optimum energy efficiency and dollar savings.

- Refrigerator: High efficiency model. 21.6 Cu. Ft. Capacity.
- Range: “Dual-Fuel” Range combines “instant on/off” gas burners (propane) with an electric thermal convection oven---the most efficient combination. The oven fan cooks foods more evenly, in less time, using less energy. Self-cleaning.
- Microwave: Multiple power levels. Built-in exhaust fan.
- Dishwasher: 4.8 gallons of water per cycle (uses less than ½ the water of standard dishwashers). Stainless steel interior. Multiple wash cycle options.
- Washer: Front loading clothes washer includes multiple temperature combinations, spin speeds and rinse options. It uses less water, energy and detergent than top-loading machines and is less damaging to fabrics. Higher spin speeds remove more moisture, requiring less drying time. Saves energy and money.
- Clothes Dryer: 5.9 Cu. Ft. load size with 6 cycles. Electronic moisture sensor that shuts it off automatically when proper dryness is reached.
- Cabinets: Spruce doors and drawers with white “pickled” finish (diluted latex). Plastic laminate covers interiors of cabinets and shelves.
- Counters: Plastic laminate on top and bottom of counters to encapsulate formaldehyde in particleboard, applied with low-VOC adhesive.

A variety of **PERVIOUS MATERIALS** were used outside for the driveway and walkways to allow rain water to flow through, reducing stormwater run-off into our waterways.

EXTERIOR WALKWAYS:

- Poured-in-place, 4” thick, porous concrete walkways on graded existing soil.
- Poured-in-place, recycled rubber, porous walkway on east side, made of 21 recycled tires.
- 2” paving bricks on graded sand with minimal concrete under outside edge for stability.
- Natural, flat, random-cut stone on graded sand.
- Recycled wood mulch.

DRIVEWAY:

- 5” of washed shell with edging material made of wood-polymer composite boards of recycled plastic and wood fiber.

DECKS:

- Decks at parking lot landing, front porch and rear porch are constructed of recycled plastic and wood waste composite materials.