Arch 464
ECS
Spring 2002 Name_____

Quiz #1

"Sustainable Vernacular Florida Cracker?"

For this problem you are the sustainable architecture critic for the *Environmental Building News*. Your topic is "Award-Winning Energy-Efficient Houses of the Past." Your assignment is to use Malcolm Wells' "Wilderness-Based Checklist for Design and Construction," which was published before the house was designed, to rate the Dwight Holmes-designed Logan House, published in *Fine Homebuilding* in June/July 1981. The modest vernacularly inspired 2,000 square foot house is occupied year-round by the owners who practice architecture in Tampa. The site is xeriscaped for low maintenance in Tampa's humid climate.

The original *FHB* article described the house thusly, "There was no air-conditioning for Florida's early residents. They fought stifling summer heat and humidity with shaded overhangs and open windows, and learned to design their houses to take advantage of natural phenomena that would help make them less uncomfortable. The most popular plan featured a belvedere set at the peak of a steeply pitched hip roof that would shed a heavy rain quickly. Rising warm air would be vented out through the windows of the belvedere, thus setting up a natural convection current to give some relief from the muggy heat. The style was the choice of so many native Floridians that it borrowed their nickname and became known with affectionate pride as the "cracker" house.

"Architect Dwight Holmes of Rowe Holmes Associates in Tampa had been fascinated by the functional design of these traditional houses for a long time, but the advent of mechanical cooling had all but killed the style. When family friends Rita and Allen

View of the south facade from the street.

SE corner showing belvedere and stairs to deck.

Logan asked him to design an energy-efficient, casual house with lots of light and plenty of room for entertaining, they were pleased with his proposal for a traditional Florida house with deck space and a high, central, full-width common space flanked by the family's private rooms.

"Site—The Logan site is suburban, but its location next to a federally protected tidal estuary lends it a rural air. Holmes tucked the house near the rear boundary of the property and left nearby palms and live oaks standing to provide shade and greater privacy. The proximity of the preserve also imposed certain design constraints. Standing on ground only two feet above sea level, the Logan house would have to be raised at least another eight feet to sit safely above storm flooding.

"Building methods—Holmes specified standard 2x4 framing between the heavy timber structural members to hold batts of 3½" fiberglass insulation (R-11) and serve as nailing surface for sheathing and interior finish. One of Allen's staples as a lumber dealer is T-1-11 tongue and groove plywood sheets that are manufactured to look like boards, and can serve as both sheathing and siding. He decided on cedar T-1-11 for the house's exterior and fir T-1-11 for interior walls not covered with drywall. The roofers were surprised that the plans called for 5V-crimp, galvanized barn roofing instead of the more elegant and expensive standing seam material. Two inches of batt insulation is installed in the roof. Floors are standard oak.

"Interior space—The house's main room soars 30' up to the peak of the roof, and accepts much of its light from the belvedere windows. Wood is everywhere—fir T-1-11 exposed over the rafters and on upper wall surfaces, oak floors, pine posts and beams, a teak rail around the stairway to the ground—set off by white drywall on the lower walls. The room sweeps the full width of the house, and sliding glass doors at each end lead out to pine decks. The effect is one of casual but well-ordered spaciousness.

"Cooling and heating—Like early cracker homes, the Logan house was designed to promote natural ventilation, though air conditioning was also installed. Bedroom windows hinged at the top are simply propped open. Those in the belvedere

Main room with belvedere windows, ceiling fan and pole for window operation.

Bedroom window propped open.

swing inward from the bottom when their latches are unhooked by a telescoping pole. Air entering through the lower windows and sliding doors rises into the belvedere and is vented back outside. The air currents are surprisingly brisk, and increase noticeable as more belvedere sashes are opened. The result of this natural ventilation is that the Logans button up the house and use their air conditioning only intermittently during the summer, rather than 24 hours a day, every day, as many Floridians must. They estimate a savings of one-quarter to one-third on their electric bill.

"The design of the house also works for the Logans during Tampa's usually short heating season. Morning sunlight streaming through closed belvedere windows heats air high above the floor, which is then pulled downward by a ceiling fan. During a normal winter the Logans turn on the heat pumps only one or two dozen evenings, relying on sunlight and a mild climate to keep warm. This past winter, though, with temperatures frequently in the twenties, the heat pumps worked "for 1½ months straight, " according to Rita. Nevertheless, their electric bills were at least 25% lower than those of friends living in similar sized houses.

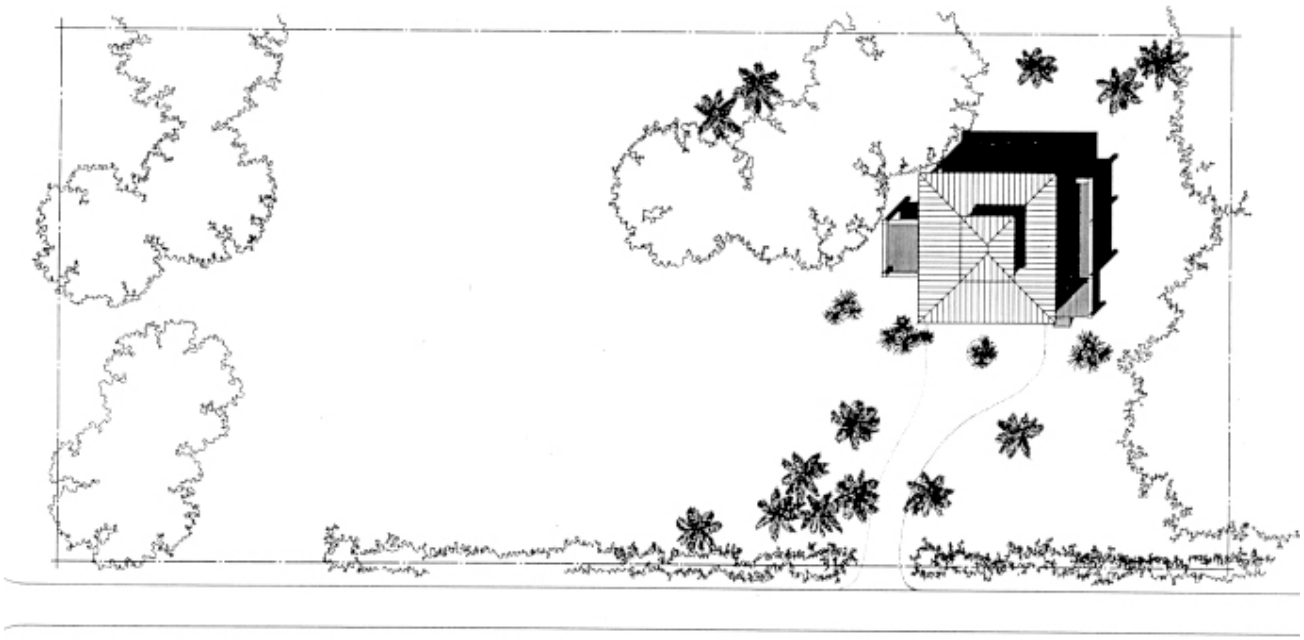
"Outdoor living—Holmes and the Logans planned decks at the east and west as integral parts of the house. Parties often flow onto the larger deck off the living area, and members of the family wander in and out of the entries they can often leave open, because the breezes at that height keep bugs at bay. Underneath the house is a carport , a storage space, and a covered play area.

"Cracker houses were developed by rural, untrained owner-builders who needed relief from unbearable heat and humidity. Their priorities have begun to make sense all over again in an era of escalating energy costs and dwindling water supplies."

Two level deck on east side.

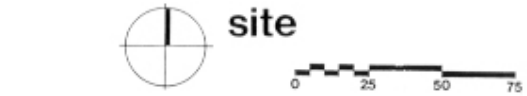
Main room, looking toward the east .

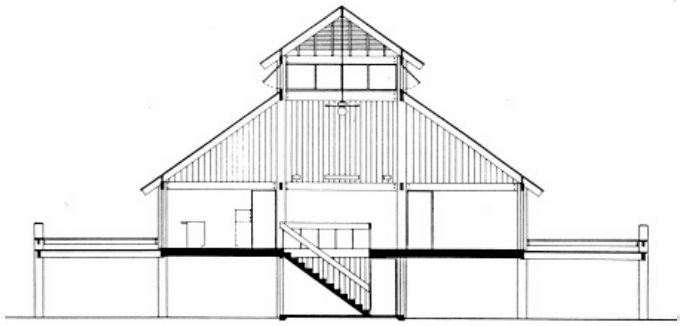
A early twentieth century cracker house on the Gulf coast.



LOGAN RESIDENCE

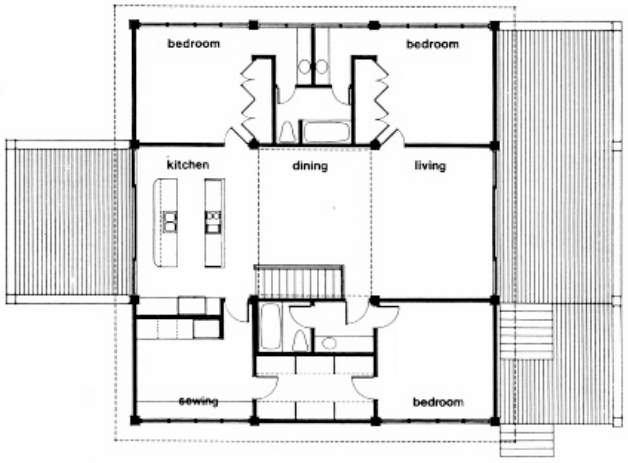
TAMPA, FLORIDA



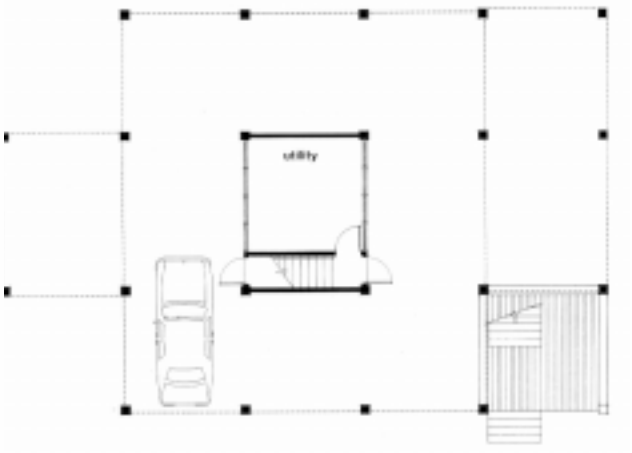


section

south elevation



living level



ground level

3 pts 1. Based on the text from *Fine Homebuilding* and the photos and drawings, rate the house using Wells' checklist. Point out which ratings you're making educated guesses on and give a rationale for your guesses.

	A	B	C	D	E	F	G	H	I	J
1	**Malcolm Wells' Wilderness-Based Checklist for Design and Construction**									
2										© M. Wells 1969
3	**Project:**									
4										
5		-100 always	-75 usually	-50 sometimes	-25 a bit	25 a bit	50 sometimes	75 usually	100 always	
6	destroys pure air									creates pure air
7	destroys pure water									creates pure water
8	wastes rainwater									stores rainwater
9	produces no food									produces its own food
10	destroys rich soil									creates rich soil
11	wastes solar energy									uses solar energy
12	stores no solar energy									stores solar energy
13	destroys silence									creates silence
14	dumps its wastes unused									comsumes its own wastes
15	needs cleaning and repair									maintains itself
16	disregards nature's cycles									matches nature's cycles
17	destroys wildlife habitat									provides wildlife habitat
18	destroys human habitat									provides human habitat
19	intensifies local weather									moderates local weather
20	is ugly									is beautiful
21										
22		negative score				positive score				
23		1500 possible				1500 possible				
24										
25										
26										
27		final score:								
28										
29										
30										

2 pts 2. Explain why you agree or disagree with this rating.

3. Re-evaluate the building using the newer SBSE Regeneration-based checklist. Annotate assumptions you made in your ratings for rows 12, 18, 20, & 24, giving your rationale for each. *2 pts*

			-100 always	-75 usually	-50 sometimes	-25 a bit	0 balances	25 a bit	50 sometimes	75 usually	100 always	
1	**Regeneration-Based Checklist for Design and Construction**											
2												© SBSE @ Tadoussac 1999
3		**Project:**										
4		degeneration				sustainability						regeneration
5												
6	the site	pollutes air										cleans air
7		pollutes water										cleans water
8		wastes rainwater										stores rainwater
9		consumes food										produces food
10		destroys rich soil										creates rich soil
11		dumps wastes unused										consumes wastes
12		destroys wildlife habitat										provides wildlife habitat
13		imports energy										exports energy
14		requires fuel-powered transportation										requires human-powered transportation
15		intensifies local weather										moderates local weather
16	the building	excludes daylight										uses daylight
17		uses mechanical heating										uses passive heating
18		uses mechanical cooling										uses passive cooling
19		needs cleaning and repair										maintains itself
20		produces human discomfort										provides human comfort
21		uses fuel-powered circulation										uses human-powered circulation
22		pollutes indoor air										creates pure indoor air
23		is built of virgin materials										is built of recycled materials
24		cannot be recycled										can be recycled
25		serves as an icon for the apocalypse										serves as an icon for regeneration
26		is a bad neighbor										is a good neighbor
27		is ugly										is beautiful
29			negative score					positive score				
30			2200 possible					2200 possible				
34			final score:									

4. Defend your rating for row 25, *serves as an icon for the apocalypse* or *serves as an icon for regeneration.* *3 pts*