

Arch 464
 ECS
 Spring 2009

Name _____

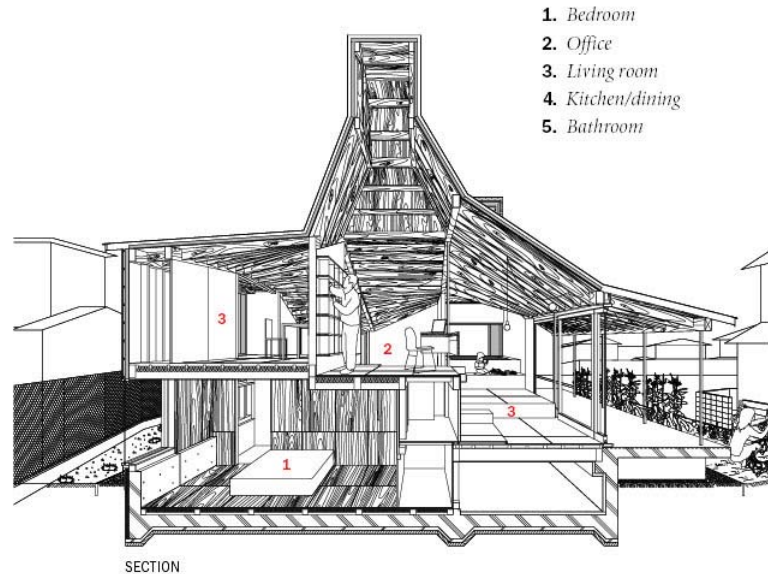
Quiz #2

"Water on a Small Lot"

For this problem you are the water use critic for the *Tokyo Times*, which is skeptical about the fitness of buildings that are "built to a green agenda" and especially in the area of water use and conservation.

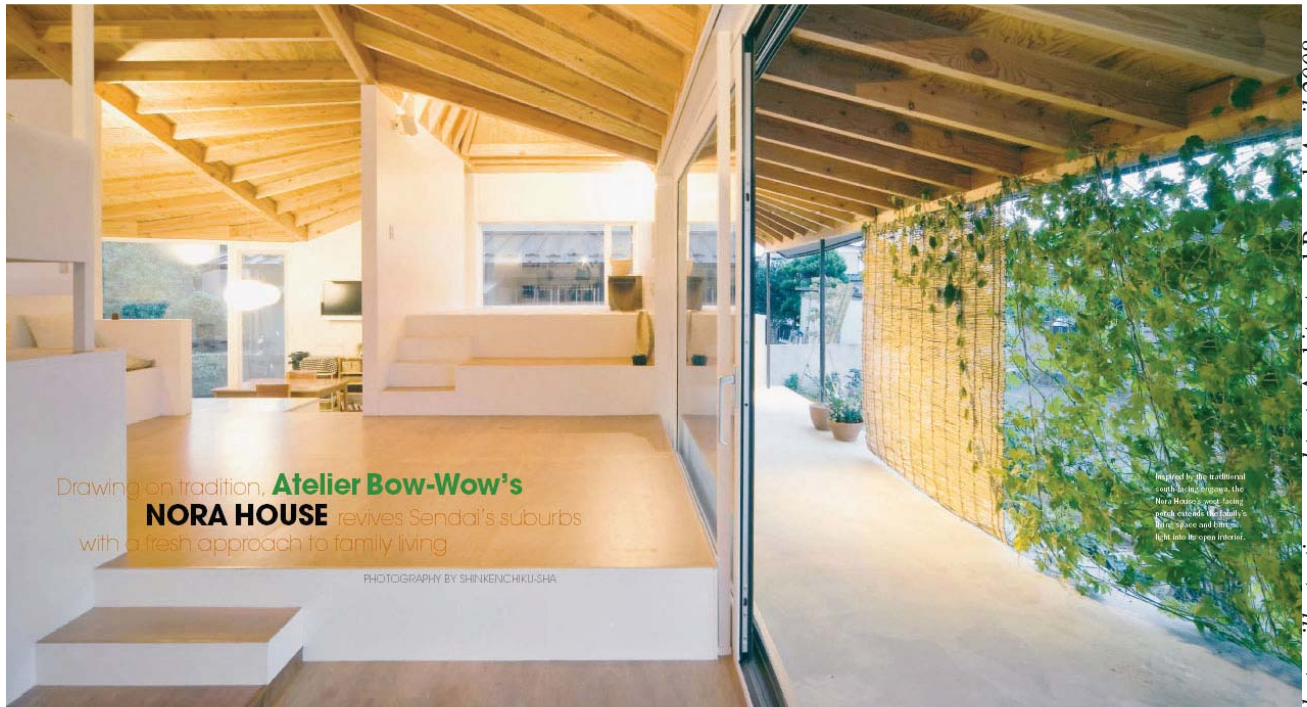
The Nora House is on a very small lot with a narrow, shaded yard to the east, a small sunny garden to the west, a dinky lawn to the south, and a gravel car park to the north.

Tokyo and its environs have a humid temperate climate that gets about 40" of rainfall annually with a bit of snow in winter (very similar to Seattle, except more humid in summer).



SECTION

Section perspective looking toward the south.



Photos, illustrations, and text: Architectural Record, April 2008.

Corresponding view of the actual house from the living room.

By Naomi R. Pollock, AIA

To the casual observer, Japan may seem slow in catching on to the current ecofriendly trend that has taken the architectural world by storm. But an awareness and appreciation of the environment has been ingrained in its house construction for centuries—for example, the natural ventilation and illumination that has become so fashionable nowadays has always been practiced in urban and rural Japanese architecture. Faced with a site where single-family homes coexist amiably with small fields of cabbages and carrots, Yoshiharu Tsukamoto of Atelier Bow-Wow unsurprisingly turned to traditional know-how for inspiration.

The goal of the architect and his student collaborators from the Tokyo Institute of Technology was not just a new house but a new house typology tailored to the typical suburban-agricultural site ringing the periphery of many Japanese cities. Situated on the outskirts of Sendai, a city of 1 million located 190 miles north of Tokyo, this 2,500-square-foot property belongs to a residential community that sprouted in the 1960s when the area was mostly farmland. One by one, houses cropped up, but as in many comparable neighborhoods, that growth slowed in recent years as the country's population dropped, the appeal of suburban living diminished, and young Japanese began migrating to the city center or Tokyo.

Swimming against the current, Tsukamoto's clients, a couple with a young child, decided not just to move back to the suburbs, but to build on family-owned, cultivated land directly across the street from the wife's childhood home. Expressive and open to the street, their custom home does not exactly blend with its staid surroundings. Though it looks out toward a large cultivated lot, Nora House stands between pitched-roof residences clad with metal siding or stucco. But it is not entirely out of place, either. Comfortably familiar without being nostalgic, Nora House, or "house in the fields," shares many features with Japan's traditional *minka* farmhouses—a covered porch, fluid interior space, timber construction, and above all, a magnificent roof that hovers protectively over the entire building.

Though modestly scaled in comparison with its historic antecedents (while contemporary urban houses tend to be small, historic *minka* farmhouses are usually huge), Nora House reads as a single-story, barnlike building. In keeping with this exterior, the interior is essentially one big space. "In Tokyo, we have done a lot of one-room living, but in a more vertical way," explains Tsukamoto. "Here, we developed the idea horizontally." Spanning a height differential of 9 feet—the walk-in storage area marks the house's lowest point, and the daughter's play area the highest point—the functional zones within this house are spread out over nine distinct levels. Fulfilling the client's request for a house with continuous interior space without many partitions, short runs of stairs distinguish areas without separating them completely. Three freestanding partitions function as dividers and additional lateral bracing.

The first set of steps connects the ground to the covered porch that forms the facade. Thanks to full-height sliding-glass doors, the porch opens effortlessly onto the foyer, where one riser leads up to the modest living area in the middle of the house. From there, stairs take off in multiple directions, connecting up to the study, play, and tatami-floored rest areas, and down to the combined kitchen and dining area. Still more stairs descend from the kitchen to the bathroom and a storage area, followed by the master bedroom partially embedded

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in the earth for privacy. Tucked beneath the study, the parents' cozy retreat is just about the only place that can be sequestered behind closed doors. But additional stairs link it back to the foyer, completing the house's circulation loop.

Paralleling the dynamic floor plane, the roof rises up, peaking where its asphalt-shingled surface surges dramatically to form two chimneylike protrusions above the study and tatami-floored areas, respectively. Like an ocean wave, each asymmetrical projection emerges gradually out of the main roof but ends abruptly in a sheer, north-facing wall topped with a squarish window. While the windows' clear glass admits soft daylight into the shadowy heart of the house, crank-operated hardware enables the client to draw hot air up and out.

The chimney windows' high position was one factor that determined the roof's unique shape; the 3-by-4-foot rectangular openings at the base of both chimneys were another. While correlating with the level changes inside, the roof also had to conform to the horizontal line of the eaves. And valleys where rainwater could collect had to be avoided altogether. Fulfilling these myriad conditions led to the roof's complex geometry. But the house's wood-frame construction accommodated the unusual form. Left exposed, the structural plywood sheets and undulating Douglas fir beams animate the interior and enrich its white walls with their pronounced grain.

At the front of the house, the roof cantilevers gracefully over the porch. Though inspired by a traditional, south-facing *engawa*, Tsukamoto's deck opens to the west, where it overlooks the remaining vegetable patch and the road beyond. "Most suburbs are lifeless," laments the architect. "All the houses have gardens but nothing happens there. I think it is better to open life inside the house to the streetscape." Though this comes at the cost of privacy, the clients reap the benefit of the porch's extended living area, which also lets in plenty of fresh air and natural light. And, truth be told, the clients do not really mind the exposure. "The only people out there are old ladies taking walks, and they've known me all my life," says the owner, smiling.

Tsukamoto's new house type suggests that younger, design-savvy families can live well in Japan's suburbs. But it is the architect's intuitive strategy of working with and not against natural forces that has worldwide appeal. ■



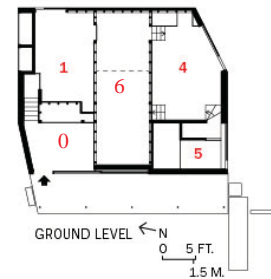
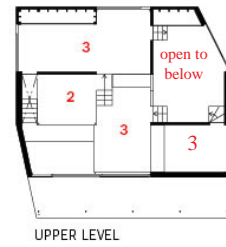
Office/study looking north.

3 pts 1. Describe three strategies that could be used on this site to manage stormwater and how the existing design is successful or how it should be modified to implement the strategies.



Garden view looking toward the southeast. Gravel parking pad to north of house, garden to the west. Context in inset.

3 pts
 2. Describe three realistic strategies the architects could have used to minimize, recycle, or avoid gray and black water. Sketch how these could be implemented in the building design. Describe why these are viable and effective strategies for this building. Draw diagrams to illustrate your proposals.



Plan.

Key:

- 0 Foyer
- 1 Bedroom
- 2 Office
- 3 Living Room
- 4 Kitchen/Dining
- 5 Bathroom
- 6 Storage.

4 pts 3. Informed by your discussions of questions one and two, propose and diagram an integrated water use and conservation plan (Eden Project and BedZED are good examples) for the building and its site, from supply to discharge. Explain how each element contributes to water conservation and quality.

