

Arch 464
ECS
Spring 2023

Name _____

Quiz #4

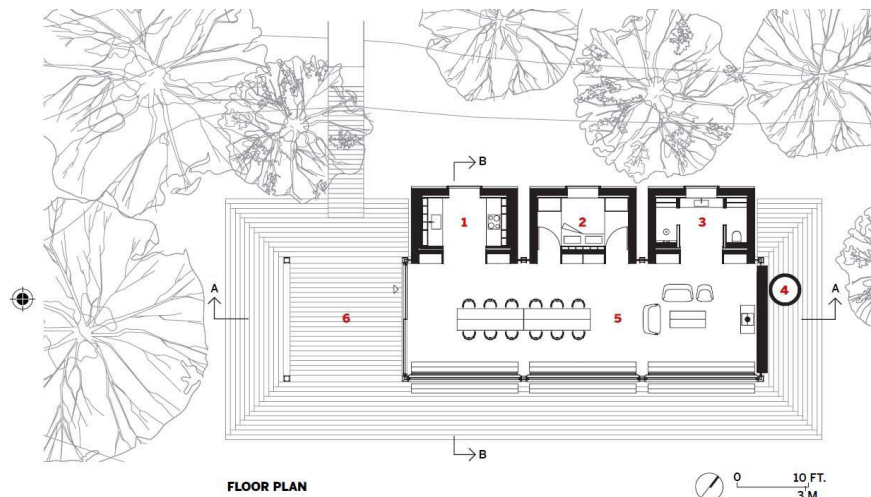
"Playing in the Saltmarsh"

Read and look at everything before you write!

For this problem you are the acoustic consultant for the homeowner who intends to invite her favorite string quartet to entertain guests during small gatherings at Saltmarsh House on the Isle of Wight, UK. She has two weather-dependent options—on fair days for an outdoor audience or on rainy days for an indoor audience. Your role is to give good advice!



Afternoon view from the south on a fair day.



- 1 KITCHEN
- 2 BEDROOM
- 3 BATHROOM
- 4 HOT-WATER TANK
- 5 DINING HALL
- 6 COVERED TERRACE

SALTMARSH HOUSE, AN INTIMATE PAVILION

For as long as the British have visited the seaside for pleasure, the country's coastal architecture has borrowed freely from far-flung places. Victorian resorts abound with onion domes and pagodas that promised new sensations and leisured ease. There is an enjoyable echo of this tradition in Níall McLaughlin Architects' Saltmarsh House, an elegant pavilion providing entertainment space and guest accommodation on the grounds of its clients' waterfront home on the Isle of Wight, four miles from the English mainland.

The main house, a crenellated 19th-century pile, sits on a low hill, with gardens that sweep down to tidal marshland adjoining a natural harbor. A winding path leads down to the pavilion at the water's edge. It's a sensitive setting, and the primary aim was to tread lightly. "We began with the idea of a delicate frame, floating above the ground," says McLaughlin. "A simple sketch might have shown a platform sheltered by a canopy roof, and the changing light coming in from the sea and the sky." Diverse influences fed the development of the design, from the memory of fragile greenhouses that once stood on the site to a widespread fascination with Asia at the time the main house was built. London-based McLaughlin also had in mind particular Australian houses, whose openness allows an intimate connection to the environment, and a certain freedom within.

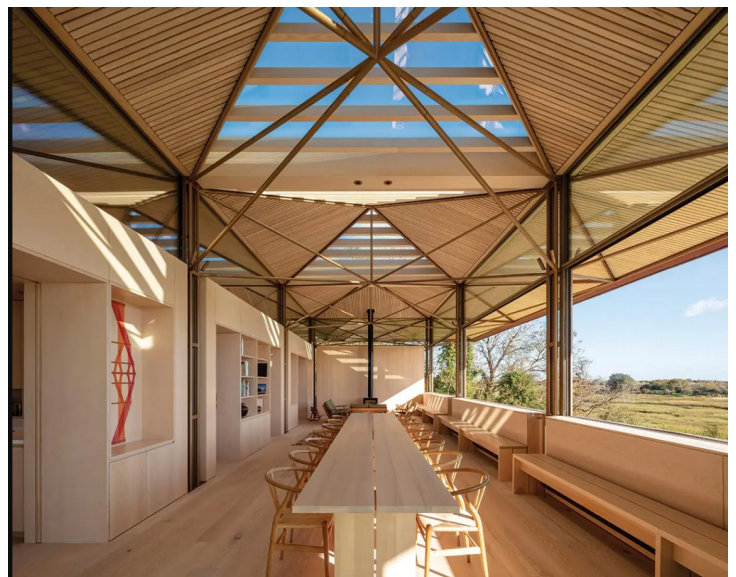
Regulations on thermal performance now make such minimal structures challenging, but the realized building has an almost ethereal lightness, which becomes more apparent on approach. Low stilts lift a timber deck just clear of the grass. Above, a dark copper roof folded into intersecting pyramids is held aloft on attenuated uprights that barely seem present. Three copper-clad volumes—enclosing a kitchen, bedroom, and bathroom—appear to hover below its deep eaves with no visible means of support.

When arriving by the short footbridge that leads to the deck, the spectacular effect of the building's featherweight frame, executed entirely in 1½-inch steel tubes, is revealed. Two rows of columns, spaced 16 feet 5 inches (5 meters) apart, produce four square structural bays, inset from the edges of the deck and roof by half that distance. Three of the bays are glazed to enclose a long glass-walled dining hall overlooking the water, with one left open to create a covered terrace at its entrance. Each skeletal column comprises four tubes in a loose cluster, so that glass walls can pass through them, preserving legibility of the frame from inside and out. Finding a way to do that was critical, says McLaughlin, but eluded the architect until he spotted quadripartite stone columns on a visit to the 10th-century Amber Fort in Jaipur, India.

Overhead, a cat's cradle of gold-painted steelwork supports the folding planes of the roof, which are expressed with slats of ash and frame triangular skylights. Within the dining hall, warm wood panels line the walls below three big windows on the seaward side, interspersed with vertical strips of glass showing how the columns meet the floor. The same careful articulation of elements occurs again on the opposite wall, where deep doorways to the smaller rooms are coupled with bookcases in three discrete blocks. More evidence of the rigorous logic governing the design appears wherever you look—cylindrical light fixtures, for example, have the same diameter and finish as the steelwork.

Harmonious coherence among the parts allows the intricate, richly detailed room to feel remarkably serene. There is enjoyment in reading the pavilion, but it can also recede from view, giving way to a more impressionistic experience of light shifting across the walls and the slow ebb and flow of the tide. Reason and feeling are both engaged. "There's something the human spirit finds deeply satisfying about the interplay between the two," says McLaughlin. "Everything sits within a logical, geometrical, and constructional order that is grounding, but at some point you can forget about the architectural decision-making and the building enables you to feel situated in a different way."

Its combination of openness, shade, and shelter allows close connection to the environment in all weather. In what McLaughlin describes as the pavilion's *coup de théâtre*, three large, motorized windows on the seaward side drop like guillotines, descending through low walls at their base to hang below the floor. Open to the air, the interior fills with



the scents and sounds of the marsh while remaining protected from the elements by the encircling veranda, which the architect likens to a Japanese *engawa*. In another moment of delight, wood screens pop up from each windowsill to prevent the room from feeling like a fishbowl at night. Their inner faces are lined with hand-painted silk and patterned with delicate wetland reeds.

Achieving such exquisite precision relied on close collaboration with Millimetre, a specialist contractor known for tackling innovative and intricate structures for both artists and architects. It was the most challenging project the firm has undertaken, says director Karn Sandilands. “We worked with tolerances of 3 millimeters throughout, which took enormous stamina and foresight.” The steel components and interior woodwork were handmade off-site, along with timber-framed “pods” for the three small rooms.



The organization of these antechambers is ingenious, if eccentric. Single pocket doors to the kitchen and bathroom align with sliding windows, providing views from the hall on axis to the garden, while the paraphernalia of everyday life remain out of sight on either side. In the bedroom, however, the building’s strict geometry means that the bed fills the length of the room, and separate doors are required to access either side of it. With beautiful built-in furniture and brass fixtures, it might be a compact cabin on an ocean liner, or a railway sleeping car from a bygone age. That might be frustrating to live in full-time, but short vacations from convention can be exciting. It’s of a piece with the whole ensemble—a building perfectly attuned to its intended use and its place, with an alluring hint of far-off architectural worlds.

—Chris Foges



SECTION A - A

- 1 KITCHEN
- 5 DINING HALL
- 6 COVERED TERRACE

SECTION B - B

Playing to an Indoor Audience

The string quartet, playing acoustic instruments (un-amplified) will perform in the 15 meter by 45 meter dining hall. This space has retractable windows and shading devices that make it acoustically adjustable.

6 points

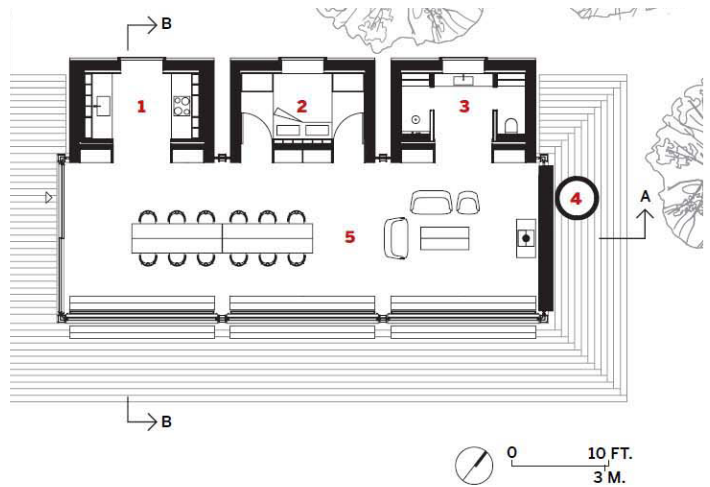
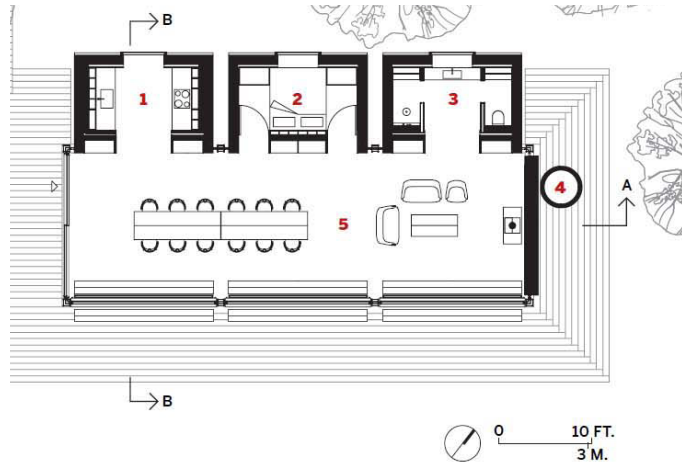
1a. In one word what's the acoustic goal for this use of the space for the quartet? Discuss the acoustic properties of the room's surfaces—floor, walls, skylights, ceiling, side rooms—and how they contribute to the goal or don't.

1b. When the windows are all closed the space is most like a classic shoebox hall. What tweaks would you do to ensure a sound performance in this basic configuration?

1c. When all the 16 ft by 20 ft windows are open does the dining hall become more live or more dead than when all are closed? Explain why.

2. Add a few simple, needed acoustic interventions (like acoustic clouds for example) and describe how they will enhance the sound in the space. Use the plans below to show your placement of the performers and your acoustic interventions for **case A** all 4 windows closed and **case B** all windows open. Do ray tracing analyses of both space configurations you have specified. What conclusion can you draw from the diagrams?

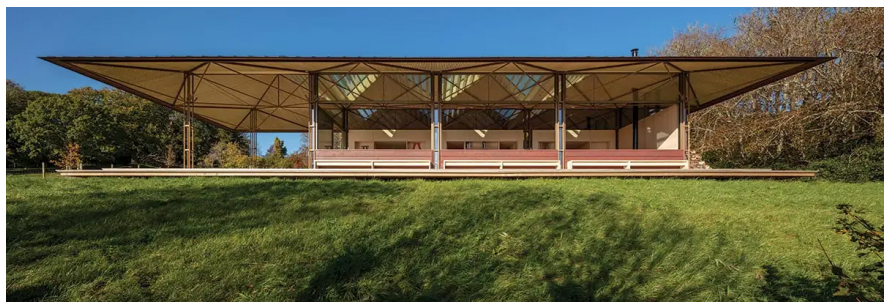
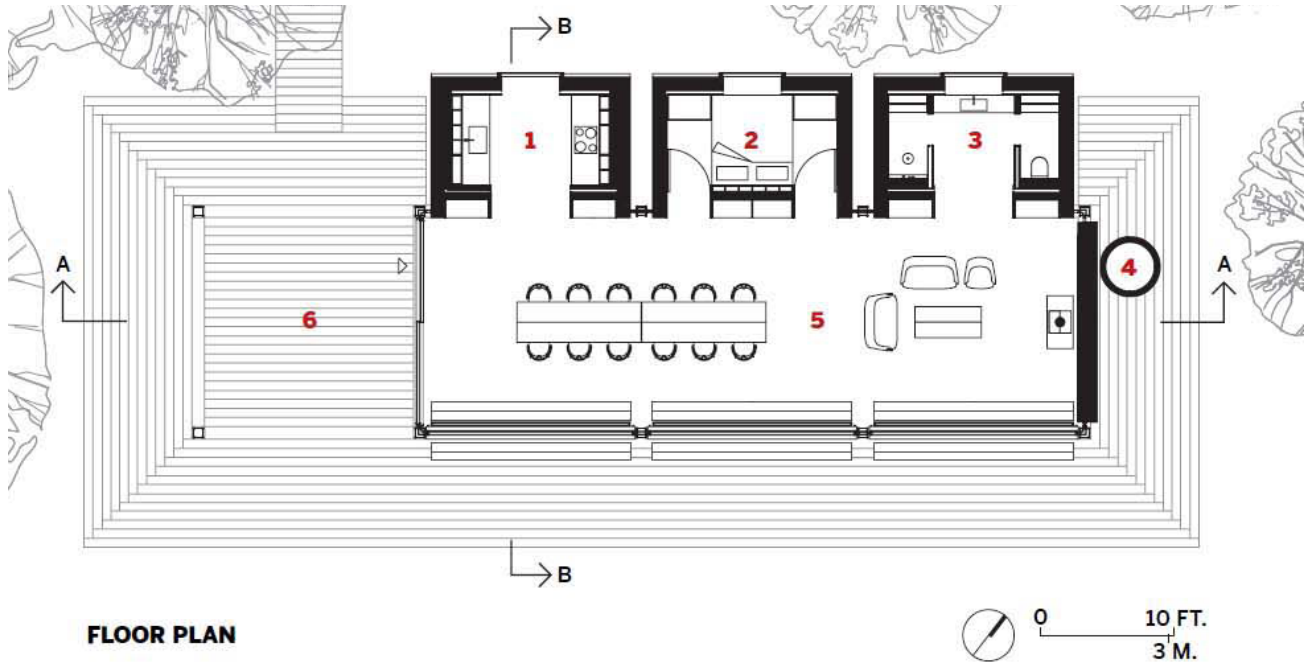
8 points

A**B**

Playing to an Outdoor Audience

5. There are two options for placement of the strings when playing to an audience on the SE or NW lawn—on the covered terrace (6 in plan) playing to the small NW lawn or in the dining hall (5 in plan) playing to the broad SE lawn with the southeast windows all open. Advise your client which one of the two options will produce the best acoustic results and explain why.

6 points



View from the SE lawn.