

Arch 464
ECS
Spring 2004

Name _____

Quiz #4

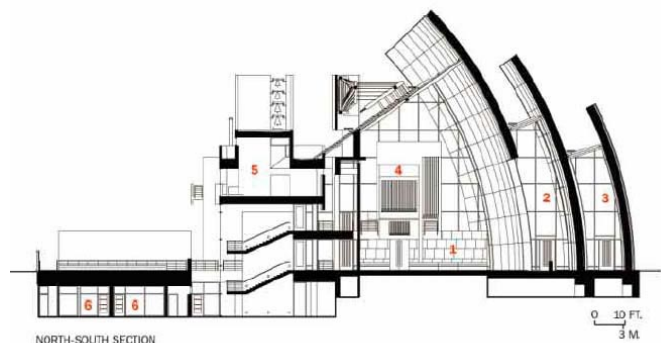
"Beauty and the Beat"

For this problem you are the acoustics critic for *Architectural Record* which will publish Richard Meier's Jubilee Church in its February 2004 issue. The draft article for *AR* claims that the church is a "stunning work, with a form of heroic simplicity that succeeds in harmonizing a number of disparate attributes and requirements." But the question put to you is, "Does it sound good?" Your role is to analyze the acoustic character of the nave and to comment on it. The non-acoustician who drafted the article offered, "...the most glaring failing in the way the church functions is in the quality of sound. Great care, Meier says, was taken to give the church perfect acoustic properties, obviating the need for microphones and loudspeakers. But the parish went ahead and installed sound equipment anyway—perhaps a gesture to modernity—with the result that in such an intimate space the voices of priests and readers sound as if they are coming out of a cheap radio."

Context. The nave is enclosed by rectilinear walls of glass and travertine marble on three sides. The wooden pews sit on a travertine floor. The south wall is a composition of three perfect segments of spheres of the same radius made of precast pieces of concrete with Carrara marble aggregate. There is a pipe organ loft at the rear of the nave. Next to the organ loft is a passageway to the priest's quarters screened by self-spaced wood slats.

Numerics. The nave averages 60' wide and is 90' long with a 60' ceiling. The properties of its materials are: slatted 20' x 40' opening to priest's quarters ($\alpha = 0.6$) and concrete walls ($\alpha = 0.04$), travertine walls and floor ($\alpha = 0.10$), wooden pews ($\alpha = 0.24$ when empty; $\alpha = 0.8$ when occupied) and glass windows ($\alpha = 0.15$). The seating area is about 40' x 40'.

Your job is to critique the acoustic design of the space and offer an opinion for *AR*'s readers.

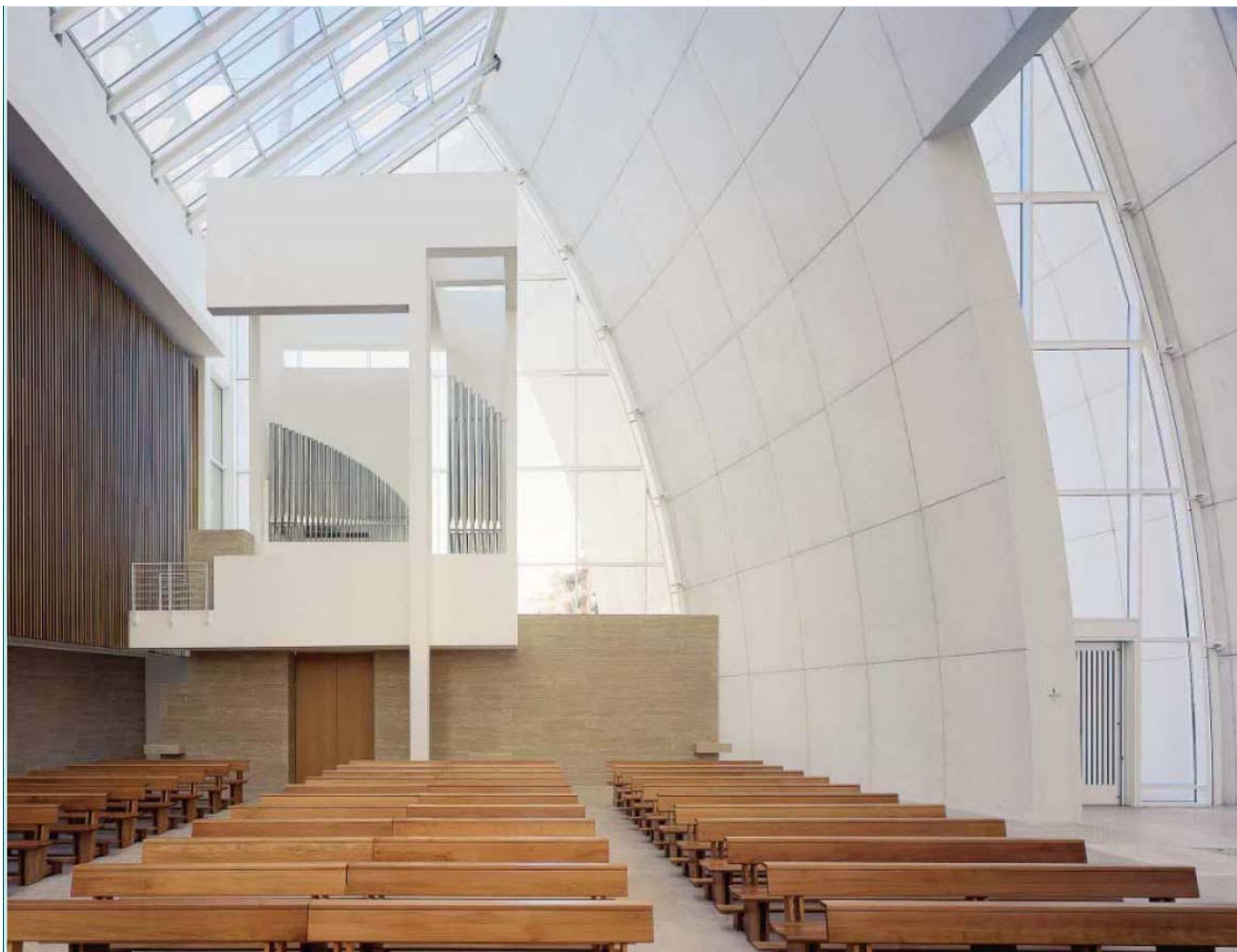


1. Nave
2. Baptistry
3. Chapel
4. Organ loft
5. Priest's apartment
6. Meeting room

102 *Architectural Record* 02.04

West facade and north-south section of Jubilee Church.

Source—All illustrations: *Architectural Record*, 02.04

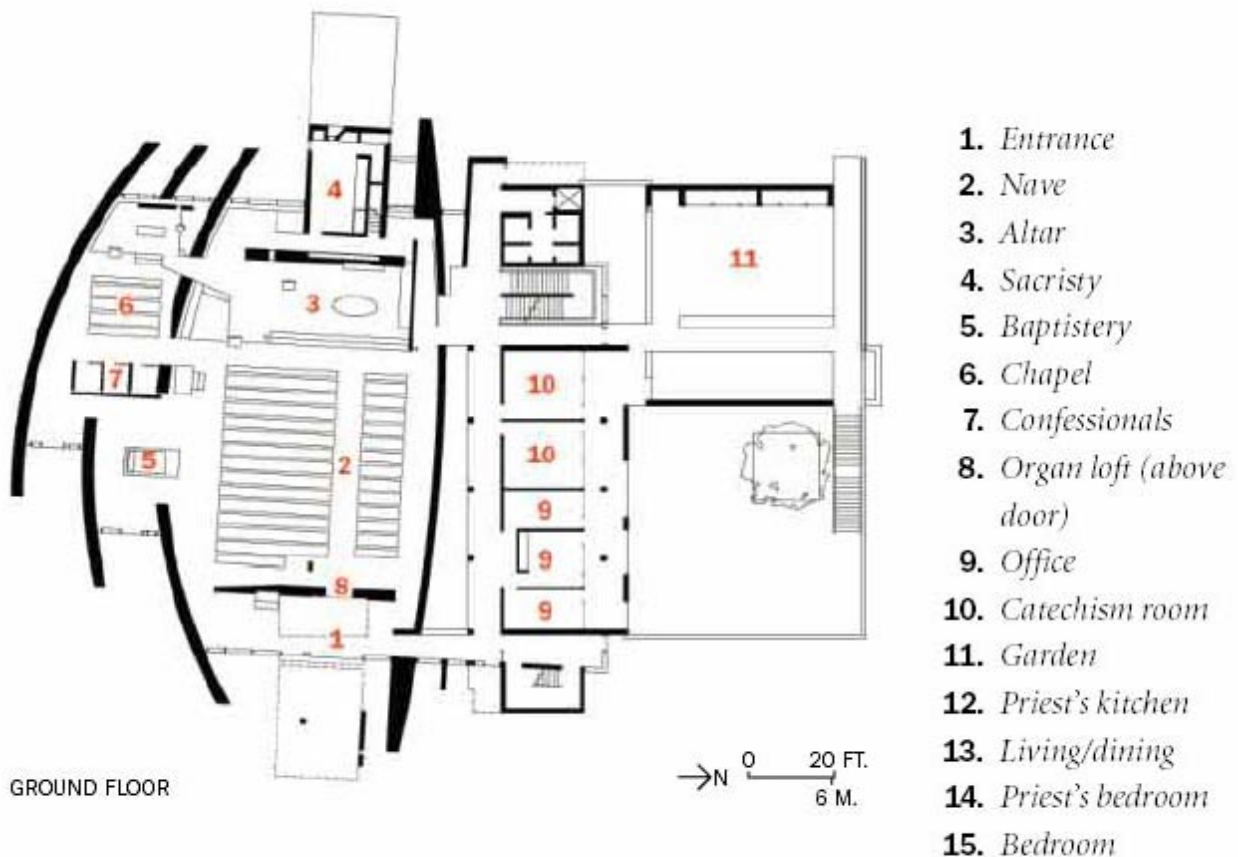


Nave views, looking forward (above) and rearward (below).

Analysis of Existing Space

4 pts

1. Categorize this space by its acoustic goal—silence or quiet—and explain how it meets this goal. Also characterize the space by its auditorium type—shoebox, wide, or surround—and defend your choice. Explain why it's appropriate (or not) for church music and sermons.

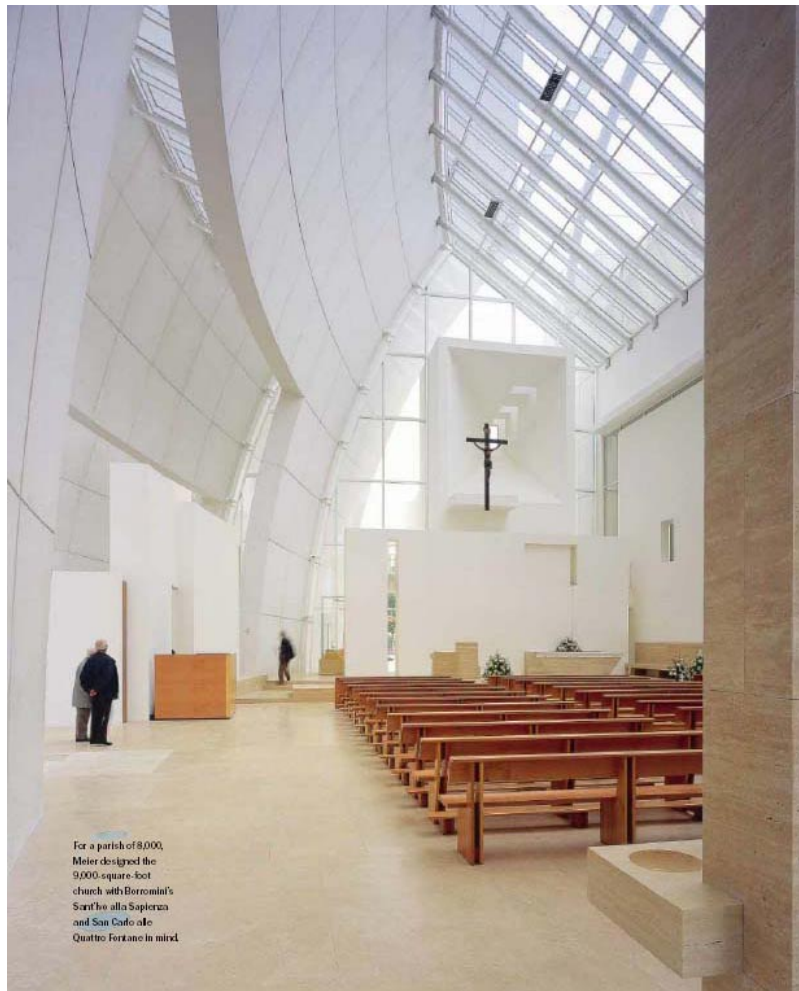


Floor plan. North is right. Priest's quarters are above catechism room and offices.

Reverberation

3 pts 2. Estimate the reverberation time for the existing space and discuss its suitability for liturgical music and sermons. Speculate on why the sound system is ineffective in this space.

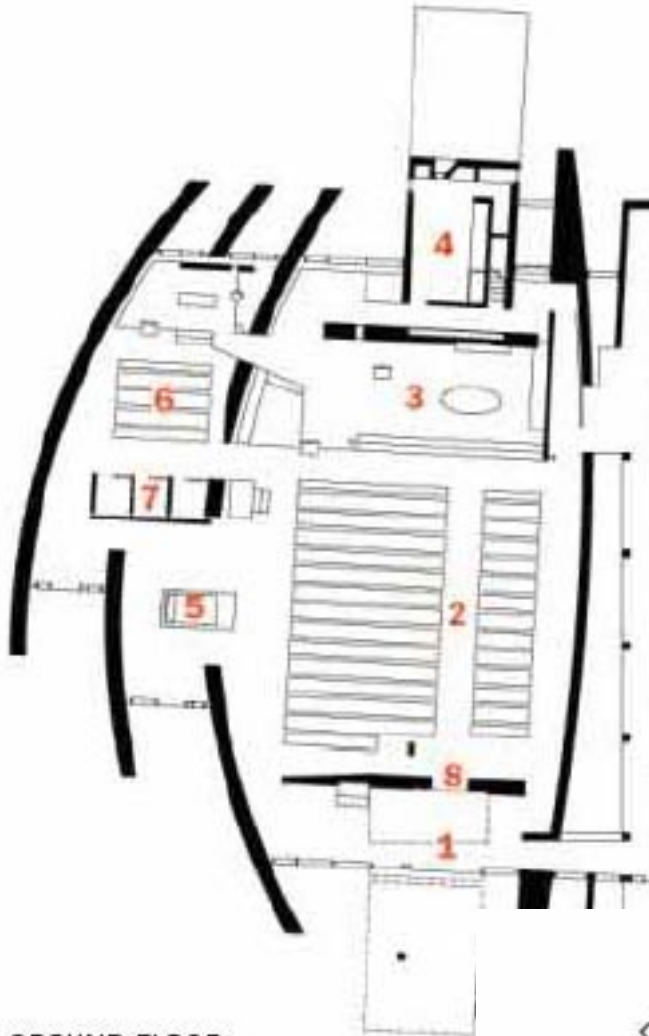
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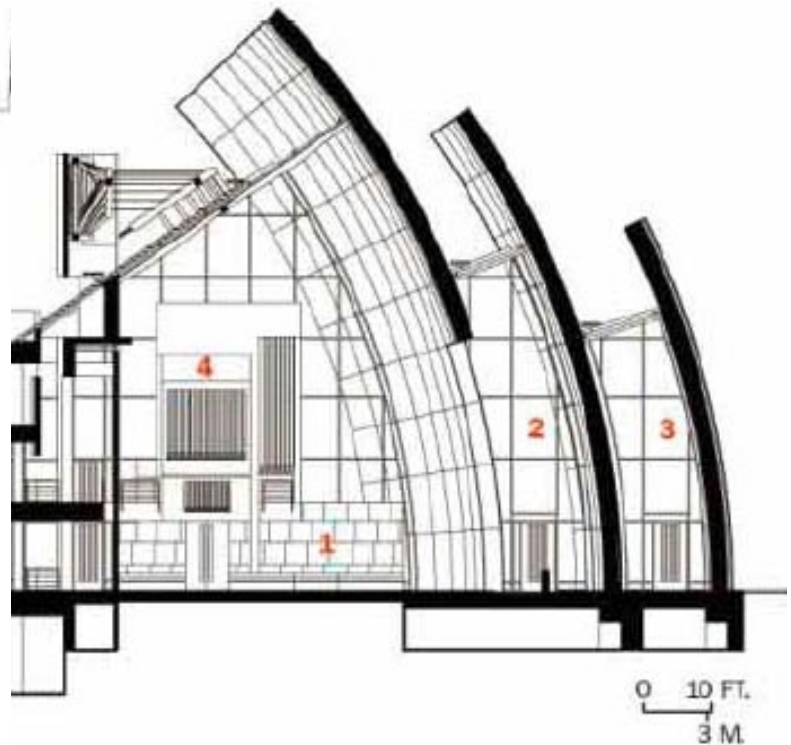
Special Features

3 pts

3. **Illustrate**, in plan and/or section, how special acoustic effects such as focusing, creep, and flutter echos will occur (or not) in the nave. **Explain** your illustrations.



GROUND FLOOR



0 10 FT.
3 M.