Arch 464
ECS
Spring 99 Name_____

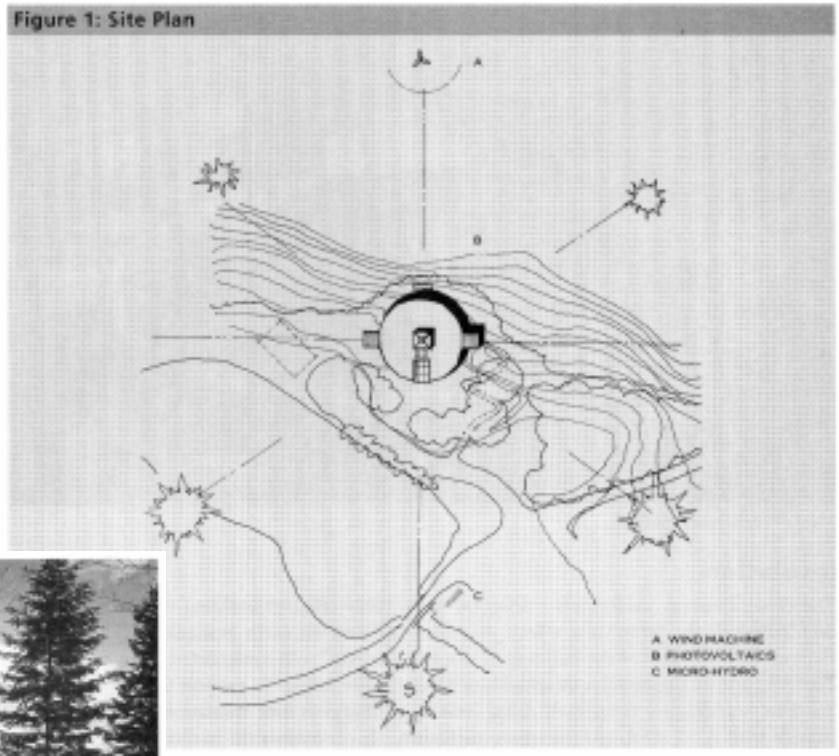
Quiz #3

"Water and Site Energy at the Boyne River Ecology Center"

For this problem you are the reality checker for the "green architect," Douglas B. Pollard. His design proposl for the Boyne River Ecology Center in Shelbourne, Ontario proposes that all energy is generated on-site and that treatment of all waste water is accomplished on-site. Your job is to articulate the issues that Pollard faces and to critique his design proposal.

The Ecology Center is located on a 400-acre tract, the Boyne River Natural Science School and Preserve, about 60 miles north of Toronto. Rainfall is moderate, about 50 inches per year, and the climate is cool and humid. The Ecology Center is sited on a south-facing slope above a pond formed by a dammed creek [see site plan below].

According to the architect, ". . .the building should be perpetually self-reliant, teach the concept of proper stewardship. . .and demonstrate that sustainable technologies and methodologies—and the adjusted attitudes and behavioral patterns that match these technologies—can be delightful, uplifting, and aesthetically rewarding." One of the specific performance objectives for the building is that it "be self-sustaining, producing its own energy and treating its own waste."



Site Plan. North is up.

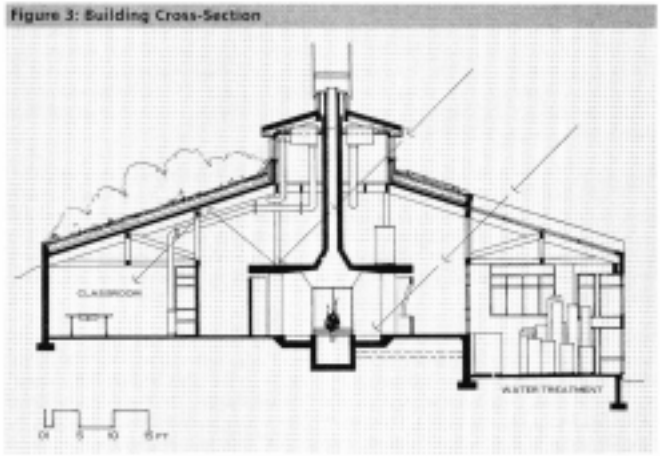
View from southwest.

All illustrations from Environmental Resource Guide.

Site Energy

5 points

1. The building was conceived without a mechanical system. All energy needed for lights and equipment, space heating and cooling, and domestic hot water must be generated on-site. Give five potential energy sources, identify what needs each can address, and explain how each can be integrated into the site and building design.



North–south building section.

South facade.

1

2

3

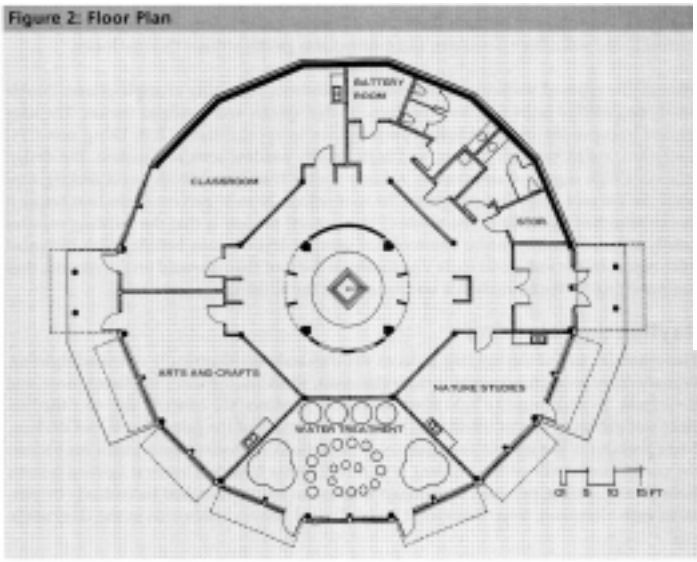
4

5

Wastewater Treatment

5 points

2. The plan features a solar aquatic waste treatment system located in the south-facing sunspace. Indicate five locations in the building and on the site, including the solar aquatic system, that pose opportunities or problems for water treatment. Explain how each can contribute to ensuring water conservation and high quality water.



Floor plan. North is up.

View of earthcovered roof looking south.

1

2

3

4

5