Arch 464
ECS
Spring 2006 Name_____

Quiz #2

"Water and Rag Flats"

For this problem you are the water use consultant for Onion Flats, a design-build firm that employs architecture students in their projects. Onion Flats wants this building to express the latest thinking in water conservation and water treatment to match the commitment to sustainable design expressed throughout the project. The design includes brownfield restoration, energy generation, and extensive daylighting.

Context. The site is an abandoned rag factory in the blue-collar Fishtown neighborhood of Philadelphia. The plans for the site include remodel of the factory for multi-family housing, building two rowhouses on the Berk Street frontage, and inserting five new 'trinity' units around an interior courtyard. Philadelphia has a humid temperate climate with about 45 inches of rain each year.

Description. *Architectural Record* described the project in its February 2006 issue. Partial text of that description is on page 2 of the quiz.

Elevation sketch of three trinities.

View of model—East facade, rowhouses, factory with rooftop PVs, courtyard, and trinity units.

All photos and drawings: Architectural Record *02:06.*

READ THE ENTIRE QUIZ BEFORE YOU BEGIN!

From *Architectural Record*:

Trinities, the three-story units are one of Philadelphia's most characteristic residential building types. Onion Flats' version of the Trinity stacks the floors irregularly, bumping them out on various sides to add space and open up the walls to insert windows and skylights that bring light into the interiors. "The units were designed so one would rarely need to turn on a light," says the architect.

All 11 units are set around an interior courtyard of bamboo gardens and a parking lot laid with attractive turf pavers. Six photovoltiac cells generate 70 to 100 percent of the electricity for the complex, giving the project a strong green ethos. An underground cistern collects rainwater that is distributed for all nonpotable uses. Shared spaces include a green roof, a community garden, a composting area, and a gym.

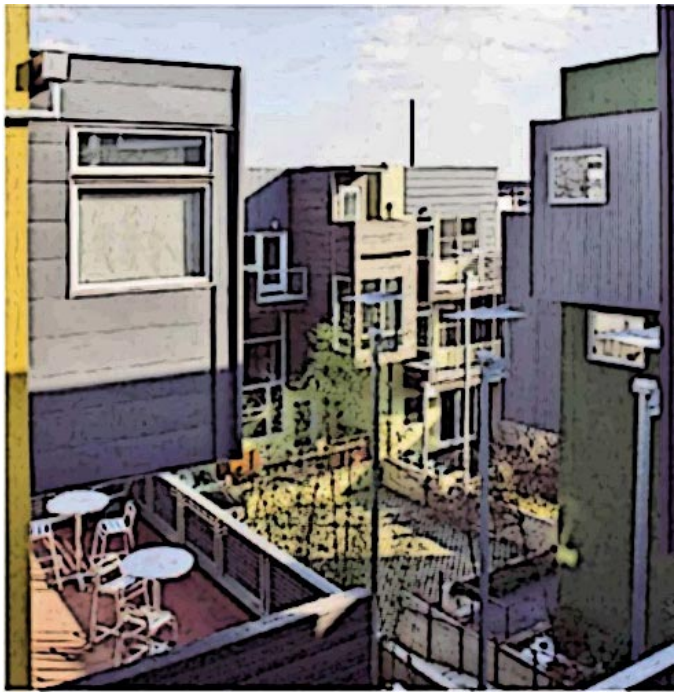
To maximize the efficiency of the 20-by-20-foot Trinities, the architects designed the roofs as outdoor living rooms, equipped with phone jacks, Internet connection, electricity, gas, and a dumbwaiter that transports refreshments for rooftop gatherings.

SITE PLAN

1. Trinity Units
2. Rowhouses
3. Rag Factory
4. Gym
5. Photovoltaic Arrays
6. Community Garden
7. Parking Court (6 cars)

View from the parking court toward the northeast.

3 pts. 1. Name three strategies the architects plan to employ to manage stormwater. Critique each for its merits and limitations.

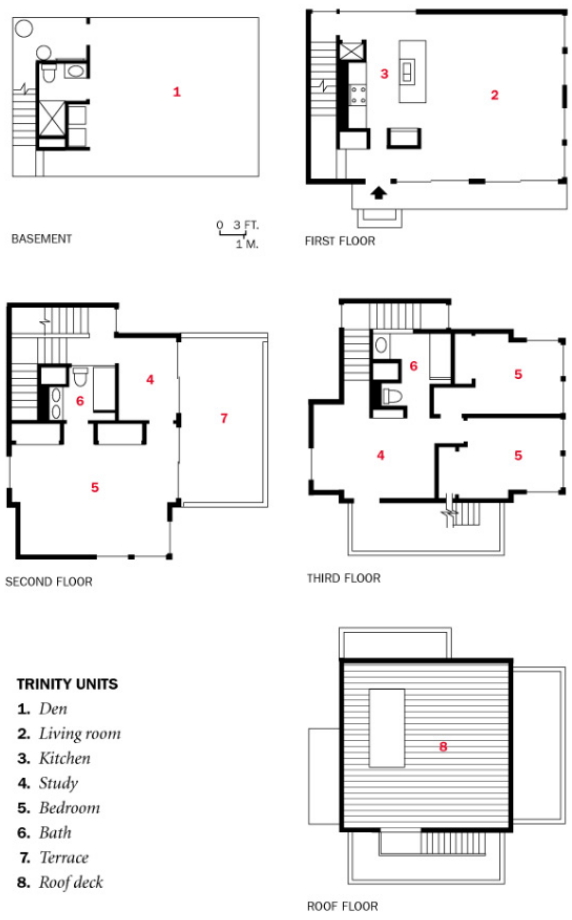


View from southwesterly trinity toward northeast.

3 pts. 2. Suggest three strategies for water conservation that could be implemented in the Rag Flats complex. Discuss the architectural ramifications of each.

Northeast facade of one of the trinities from the parking court.

4 pts. 3. Propose two alternatives for on-site black water treatment. Annotate the building and site plans or make sketches and diagrams to illustrate your ideas. Explain which one you prefer and why.



Plans of typical trinity. Each one has a different orientation.