

## BREADTH TOPIC : ARCHITECTURAL DESIGN

Both the City of Seattle and the Fred Hutchinson Cancer Research Center have openly declared their commitment to the environment. They each have recognized the ecological effects of development and they each have taken appropriate courses of action. The combination of FHCRC's & the City of Seattle's devotion to the environment make the campus a prime candidate for the promotion of green roof technology.

The integration of the architectural design and the engineering of building systems can significantly reduce the ecological footprint of a building. Green Roofs are a specific example of the integration of design and engineering.

Implementing a Green Roof system provides multiple benefits both to building occupants and the environment. One such benefit is mitigation of the urban heat island effect. The urban heat island effect is the tendency of more metropolitan areas to have a higher average temperature than surrounding rural areas. Rising temperatures of urban areas can directly impact local, and potentially global, weather patterns and environments. Green Roofs radiate significantly less heat than asphalt roof systems. The plants of the Green Roof also actively cool the roof through the process of evapo-transpiration; the cooling effect felt by a person sitting under a tree. The release of water by plants cools the air through the process of evaporation. Green Roofs also significantly improve the effects of stormwater runoff.

The design for a Green Roof will be completed for Arnold Building. Existing conditions will considerably impact the design. The design of this alternative roof system will be completed with the existing structure. It will address the feasibility of retrofitting Arnold Building as it was constructed for a Green Roof application. Structural implications will be investigated. The cost of the roof installation will be addressed as well as anticipated maintenance costs.