Because of my international background, I had a really strong impression when I arrived and studied in the United States. I have grown up in Hong Kong - a tiny, crowded city - with high population density and many of high rise buildings in order to provide enough living and working place for all the people in the city. Therefore in Hong Kong, almost of buildings have been designed and built skyward. On the contrary, when I arrived in the United States which is a huge continent, I realised that the environment, culture, trasportation and lifestyle, are extremely different. For example: A large scale shopping mall may be located far away from your home. People have to drive a few miles or more on highways to their offices every morning, also wasting time on rush hour traffic. Can we create and design a multiple-use project to study these problems?

The project also explores the natural elements - sun, water, air that play important roles and provide energy for the building. How can the natural elements be used in the building?

The project program includes a lot of activities and functions such as residential for living; commercial for working; library for reading; mall for shopping; restaurants for eating; piers for moving; garage for parking; church; garden...to create and design a building that will be occupied 24 hours a day, day or night; sunny or cloudy; summer or winter.

(Above images show the initial concept of the project. Any buildings won’t be occupied at some particular time in a day.)
Alexandria is located in Northern Virginia across the Potomac River, six miles southwest of Washington, D.C. and nine miles north of George Washington's Mount Vernon. The city encompasses 15.75 square miles at an average elevation of 30 feet above sea level.
Old Town Alexandria is one of America’s most historic communities which has many authentic eighteenth-century buildings with the charm of the “Old and Historic District”. With more than 250 years of history and hospitality to its credit, Alexandria offers an array of historic and cultural attractions. Alexandria’s many historic homes, churches, businesses and museums allow residents and visitors alike to experience the hand of the past that makes Old Town Alexandria the charming and historic town it is today. Also, the city was ranked one of the best 200 America’s largest cities.
The project site is located on Cronoco Park which is located at the east end of Wythe Street and North Fairfax Street. As the project developed, the site was modified to above the water of Potomac River later. Basically, the east side of the site is the Potomac River and opposite is the city of Alexandria to the west.
This is a study of the relationship between the site and natural elements such as sun course, orientation of the site, and grid lines of the city.
Mixed-Used Examples of tall building in Historical and Modern.
Marseilles Block by Le Corbusier in Marseilles, France

This huge apartment block was conceived as the ideal family habitat, complete with supermarket, bakery and tennis court. Hotel rooms are on the small side but attractively decorated and furnished, and from the rooftop we can have a great view of the sea.
Price Tower by Frank Lloyd Wright in Bartlesville, Oklahoma

It is also originally designed to combine business offices, shops and apartments such as a multi-functional building.
The first concept drawing which includes residential above, shopping mall below and commercial area located behind.
Concept drawings and model of TIME & CLOCK.
Base on the peoples’ time table in a day, I tried to sketch the shape and location of the building, and explored the relationship between the building and the site. We can realize the sun’s course from the shadow of the building and the building itself in these pictures.
THE DESIGN OF BUILDING IS BASE ON THE FOUR DIRECTION: NORTH, EAST, WEST, SOUTH AND THE END OF MY SIDE IN ALEXANDRIA. BOTH WATER FACADE ARE TAKING RIVER SIDE & CITY SIDE. ALMOST AREA OF THE BUILDING COULD BE LIGHTED BY SUN COURSE IN DAY TIME.
Residential Study: Living place is a major part of my project, each apartment unit has two stories with dining area, kitchen, bathroom and master bedroom with either river or city view. Air can blow through columns up to each unit, the area between units is used for ventilation.
The initial design has a variety of functions in the building like a mini city. It included: playground, residential area, food court, shopping area; sport court, library, commercial area, restaurants and automobile parking.
Design Development: Focus on the structure of the building and added the concept of the bridge which linked the ends of Madison Street and Pendleton Street.
Design with inspiration of bridge with cable rods link both sides, supporting the weight of the building itself.
Study of angled columns forming structures to support the building.
Photos of study models with different masses.
Images of building on the site.
Drawings with different colour and legend above which showed the layout and functions in the building.
Hong Kong Shanghai Bank by Norman Foster in Hong Kong, China

The idea of using natural lighting is one of the features in this building. There are two computerized sunscoops which were used to track the sun location, together with mirrors positioned both outside and on top of the building atrium to diffuse sunlight to different floors through atrium and down to the plaza floor.
The skylight bladed system is one of the most important parts of the building. This design consists of two parts: Blades and skylight, the former is installed above with reflected mirror panel on each blade which can be motorized to move with angle of the sun in different seasons, the purpose of that is to bring the natural light and direct it through the skylight across the atrium space during day time. The skylight set below the bladed system, is operable such as a slide window which can be opened or closed to control the inside temperature. It can be opened for ventilation in the hot season; and closed to keep warm in the cold season. Both mechanical systems and motors are controlled by a computer programmed to know precisely how high the sun will be on every day of the year.
The computer drawings show how the sunlight reflected through the blades with mirror blades indirectly down to the opened skylight on hot days; the sunlight can be captured directly and down to the closed skylight on cold days.

The details of the bladed skylight system shown in the physical model.
Ships will be one of the major modes of transportation for people moving between Alexandria and Washington DC. I created a floating pier that will rise or sink depending on the sea level at different times during the day. Whatever the height of the water, people can walk down with an immovable staircase onto the floating pier.
Section and plan drawings show the layout of tropical apartment unit. Each unit has a dining area, living area, kitchen, bedroom and bathroom in the lower level, and upstairs is a master bedroom with balcony in which people can enjoy the sunlight in the day time.
A large truss structure is created for the residential area and church at the top. The end of the truss will be supported by the columns below. Apartment units are inserted between each level of the structure, and people can reach each floor with funiculairs on the sloping side or elevators from the church side.
Breathing Skin

Mesh and Frame Details

Section

Elevation

Plan

Metal Support

Steel Angle

Steel RHS

Stainless Steel Rod

Mesh