IPRO 356: Vertical Innovation
A Garden in the City

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Our Challenge

The redevelopment of the 37-acre Michael Reese site constitutes a major civil engineering project, considering several civil engineering aspects. Typical concerns include design of pedestrian bridges, residential buildings, hotel buildings, air traffic, transportation facilities, train or bus terminal stations, and other structures.

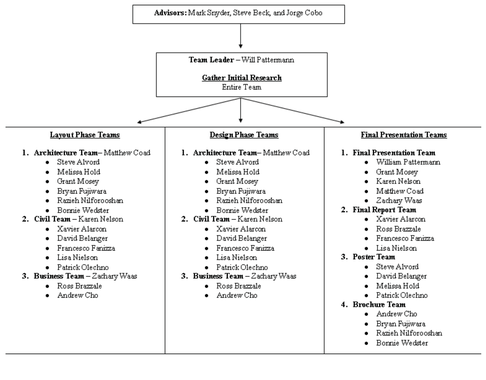
Project Summary

(1) Selection of the type of structure to b e used (steel or concrete)
(2) Structural analysis and design including proportioning typical girders, columns and foundations and a check of pertinent serviceability requirements (deflection, cracking, and floor and/or roof vibration)
(3) Study of parking around the structure (if the project involves a building)
(4) Design of the traffic flow capacity and transportation issues;
(5) Pedestrian accessibility as stated in the Americans with Disabilities Act
(6) Preparation of construction scheduling and detail drawings
(7) An estimate of the project cost.

Objectives

(1) Establish the market needs for the site and expected owner
(2) Develop an integrated approach to the project involving engineering, architecture, and sustainable cost/benefit that meets/exceeds the market needs for the site and expected owner
(3) Determine the benefits versus costs of the approach
(4) Compare benefits versus costs to comparable buildings near the site or elsewhere to show the project is a superior product as a business plan.

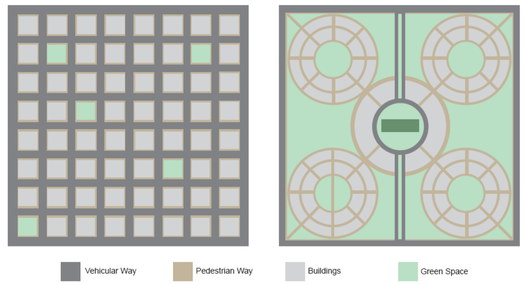
Team Unity



Our Solution

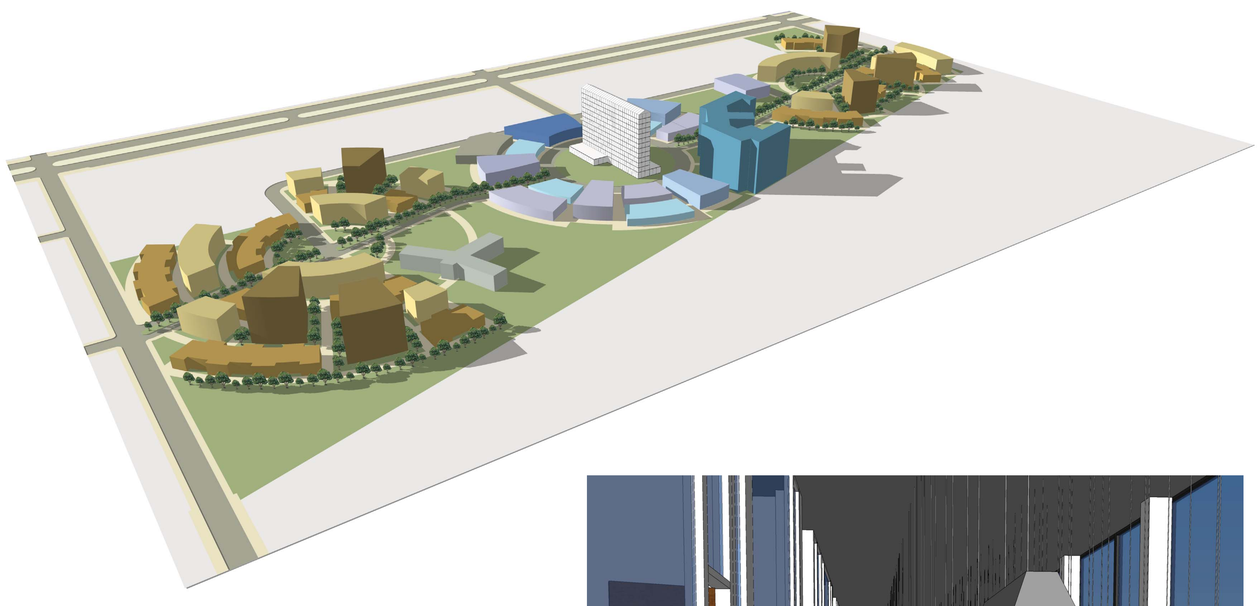
Typical Urban Condition
- -Vehicle Oriented
- -Unwalkable
- -Paltry, Dijointed Green Space
- -Geometrically Rigid and Unforgiving

"New Urban" Condition
- -Pedestrian / Public-Transit-Oriented
- -Highly Walkable
- -Generous, Cohesive Green Spaces
- -Geometrically Flexible and Adaptable



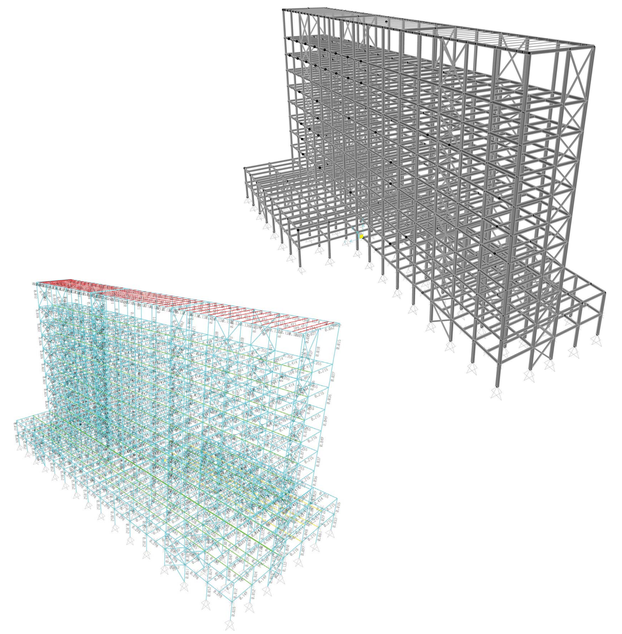
Stagnant Bronzeville Infill
- -Does Not Respect Heritage
- -Monolithic and Inflexible
- -Economically Nonviable
- -Low Occupancy / Density

Vibrant Bronzeville Infill
- -Reverse Heritage
- -Bright and Colorful
- -Economically Strong
- -High Occupancy / Density



Veritcal Farm Grow Systems
- Hydroponics: uses a mixture of water and nutrient solutions without soil
- Aeroponics: uses a nutrient enriched spray that is delivered periodically on the plant's root mass
- Aquaponics: disposes organic materials by using fish and plants for composting methods and technologies that produce energy for the building.

Structural Analysis/Design



To build a Vertical Farm:
- Narrow, Wide, and Tall
- In Chicago, give greatest exposure to Southern facade
- Uniform column grid gives continuity in design
- Make it "LEED" certified