IPRO 356 Project Plan
Spring 2010

Design of a Large-Scale Structural System for the 21st Century – Team 1

An Entrepreneurial IPRO Project

Advisors: Mark Snyder, Steve Beck, & Jorge Cobo

1. Team Information

A. Team member roster: See below
B. Team member strengths, needs and expectations: See below
C. Team identity: See #4

Name:	Major/Minor	Skills & Strengths	What We Want to Gain from IPRO 356
Alarcon, Xavier Alexander	Civil Engineering / Structural Engineering		
Alvord, Steve	Architecture	Creative problem solving, architectural design, model building and digital rendering	Working in a team, site development, and entrepreneurial skills
Belanger, David	Civil Engineering / Construction Management	Construction, Hydrology, Drafting, AutoCAD, MathCAD, SAP	Dave is looking to further his experience working with a team. He doesn't have opportunities to work in a large group dynamic in his other classes and would like to gain that ability through this IPRO.
Brazzale, Ross	Civil Engineering	Writing, excel programming, researching	Receive information from community colleges from which we can tailor and best use our research and analysis of supply, conversion, and usage of currently wasted corn stover for the development of localized CHP generators.
Cho, Andrew	Mechanical Engineering	AutoCAD, microsoft office	
Coad, Matthew	Architecture	Autodesk, Adobe, and Microsoft programs, the design process, organizing information and people, building practice, cost estimating, and scheduling	I would like to use my knowledge on vertical farming, urban farming, grow systems, compost methods, waste/energy loops, sustainable energies, agricultural practices, and material technologies to further benefit the community
Fanizza, Francesco	Civil Engineering	Structural Engineering, Mathematics, Computer knowledge including: AutoCAD, MathCAD, Matlab, Microsoft Office suite.	Hoping to learn to communicate better within large groups, and between different large groups, work in a more professional setting, become more proficient in structural design with both steel and concrete.
Fujiwara, Bryan	Architecture	AutoCad,3D Studio, Revit, Adobe Photoshop and Illustrator. Great with communication skills and people skills.	Would love to meet new people & gain first hand socialization skills with professionals

Name:	Major/Minor	Skills & Strengths	What We Want to Gain from IPRO 356
Hold, Melissa	Architecture	Putting together presentations and keeping a group on task. I am also good at keeping track of assignments and progress. I like to work on the conceptual phase of architectural projects	
Mosey, Grant	Architecture	digital modeling and representation, digital animation, architectural design, effective public speaking	to develop a collectively oriented and successful project
Nelson, Karen	Civil Engineering / Structural Engineering	I have great organizational and administrative skills. I also have experience managing a group	I hope to gain experience in the group dynamics when designing a structure and in how a real structure is designed. I also hope to come out of this IPRO with solid project experience that I can use to jump start my career after college.
Nielsen, Lisa	Civil Engineering		
Nilforooshan, Razieh	Architecture		
Olechno, Patrick	Civil Engineering	SAP2000, MATHCAD, AUTOCAD, and other Microsoft Office products. Knowledge of building permits and other city hall requirements.	Expecting to finish very well in overall ipro groups. Since most of the group is made of Civil Engineers and Architects this should give a preview of how projects work in the real world.
Pattermann, William	Civil & Architectural Engineering / Construction Management	Statics, Plumbing, HVAC, Construction, Thermodynamics, Circuits, Hydrology, Drafting, AutoCAD, MathCAD, SAP	Will is hoping to gain an understanding of how real world business works. Will is really excited to gain team experience and is anxious to use his talents in a group setting.
Waas, Zachary	Mechanical Engineering	AutoCAD, Solidworks, excel, group work, hands on metal and wood work, communication skills	To complete a successful project, learn more about the entire development process, and build new friendships
Wedster, Bonnie	Architecture	Designing boards and graphics, time management	

2. Team Purpose and Objectives

A. For the spring of 2010, two Entrepreneurial IPRO teams have been established to focus on an identical challenge, namely, IPRO 356 and 359. The two teams will pursue the same goal and will be regarded as competing development teams in developing a viable business case and engineering design to address a specific site opportunity. It is envisioned that the two teams will focus on developing a business case and design for structures to be located on the former Michael Reese site, which was to have originally been the site of the Chicago 2016 Olympic Village but now will become the focus of a major future development in the years ahead.

B. This integrated design course involves a complete design of a major civil engineering project, considering several civil engineering aspects. Typical projects may include design of pedestrian bridges, residential buildings, hotel buildings, airports, transportation facilities, train or bus terminal stations, and other structures. As a minimum, the project requires:
   (1) Selection of the type of structure to be 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.

   In addition to the integrated design challenge, this Entrepreneurial IPRO (EnPRO) project also involves a business investigation. Member of the team will address the following tasks in a collaborative way across disciplines:
   (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.

3. Background

A. Currently, there is no sponsor for this IPRO/ENPRO

B. The main problem which our project faces is what to plan to build in the Michael Reese site, which was recently demolished to make room for the Olympic village. Since Chicago did not win the bid for the 2016 Olympics, the site remains vacant and unused. The basis of the IPRO is to develop a plan for this site, and, specifically, to design a building to serve as an anchor for the area. This anchor building should serve the community while still remaining economical.

C. After deliberating on possible solutions to our problem, is was decided that the highest and best use for this 37 acre site would be based on the idea of the Vertical Farm (Dickson Despommier) being the main design element with various secondary building programs as support. As can be expected, there are many technologies and sciences that need to be considered when bringing a historically outdoor activity like crop production under the protection of a building. On the upside, all the technology and science required to produce such a building is already there, it only needs to be implemented in efficient and sustainable ways. Concerning the production of food, there is a wide variety of grow systems. Due to the prospect of efficient crop yields, we are only focusing on methods that will give efficient results. Hydroponics is a grow system that uses a mixture of water and nutrient solutions (typically derived from aquatic plants) without the aid of soil as a growing medium. Aeroponics differs from hydroponics in that there is no growing medium whatsoever; nutrients are delivered via a nutrient rich mist that is sprayed periodically on the plant's root mass as it grows. Aquaponics is a growth method that employs a mutually beneficial relationship between fish cultures and plant cultures. Disposal of organic materials requires various composting methods and subsequent technologies that in turn produce energy for the building; worm boxes, anaerobic digesters, turbine generators, reverse osmosis units, AC power converters, etc. Production of crops also requires the most innovative lighting technologies using LED's and solid state horticultural lighting, automated system controls, extensive passive heating and cooling strategies and technologies, and an extremely sensitive knowledge of material technologies, bioplastics, and non-toxic, naturally derived solutions and chemicals. The building itself will require integrated waste/energy loops to lessen the buildings energy cost, along with passive energy collection from shrouded wind turbines, building integrated photovoltaic's, and rain/wastewater collection. There is an unlimited amount of technologies that can be implemented into the design of a vertical farm, and as the scholarly world grows more interested in the idea, more technologies are designed every day.

D. Our primary problem, discovering the highest and best use of this valuable lakefront property, has been grappled with several times before. The solution with the most longevity was the development of Michael Reese hospital, which provided service for the community in varying capacities from 1881 to 2008. In the middle of the 20th century, noted International Modernist Walter Gropius conducted work on several buildings on the hospital campus. With budgetary difficulty and ownership change, the hospital's role in the community began declining sharply in its later years. The most recent viable proposal for the now-stagnant site was the development of 2400 residential units in 21 twelve-story towers to serve as the Olympic village for the Chicago 2016 games. In preparation for this development, demolition contracts were issued and the aforementioned hospital, complete with Gropius buildings, was largely demolished. With the loss of the Olympics, the site lies fallow, awaiting an environmentally-sensitive and fiscally-viable redevelopment.

E. The Michael Reese site is one of both historical significance and contemporary controversy. The site and structures within were designed by Walter Gropius and are closely related to the style of buildings at IIT, a neighbor within the Bronzeville community. Though many structures have been demolished, an effort needs to be made to either preserve one of the existing buildings or at least come up with a plan that emphasizes the architectural significance of the previous design of the site.

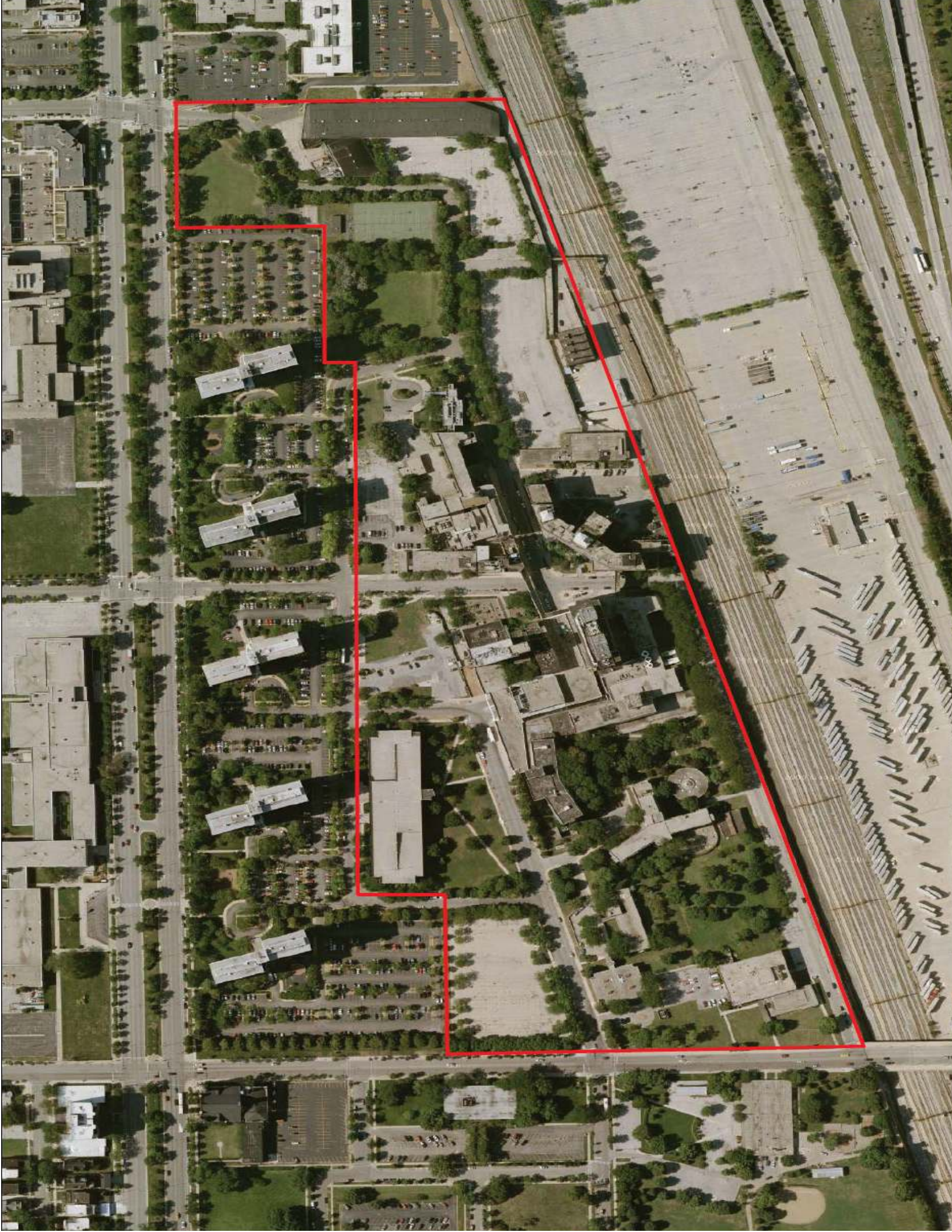
   Additionally, any plan that is developed needs to accommodate the needs of the community, both present and anticipated. Bronzeville is currently composed of residents with a wide variety of incomes as well as many students. Additionally, areas south of the Loop have slowly been developing for the past 5 years, so our site plan needs to capitalize on this development to ensure that the community members of Bronzeville will be provided economic opportunities should this southward development continue. With the community's benefit in mind and a focus on the environmentally sound "new urbanism," our site plan needs to focus on things that will attract businesses and consumers to the community as well as provide jobs for the many residences.

F. In a world class city such as Chicago having the Michael Reese site be a vacant property so close to the city's epicenter is not only an eyesore but also comes with great economic and social costs. There are two main costs associated with this site, the actually cost of owning the land as well as the loss of potential economic development. The site was initially purchased by the City of Chicago for $86 million dollars, and due to Chicago's loss of hosting the Olympics the price has increased by another $5 million. If the city does not sell the site within five years the price is scheduled to increase by another $5 million, all of which was agreed to in the purchase contract. With city finances already being stretched to the limit it can neither afford to keep the site nor has any recreational uses for it which makes the site an uncomfortable burden to keep and manage. The social cost of this site as it stands now is many times greater than just the cost of owning the land. This 37 acre area is currently abandoned, fenced off, and is in the process of demolishing the remaining site buildings. The lack of development has enormous consequences in both the lack of tax revenue for the city as well as having negative consequences for the local community. With a piece of land this size, development is critical in order to have a prosperous neighborhood. Though it is hard to establish an exact amount, the cost of leaving the site in its current state of disorder will undoubtedly reach into the millions of dollars from lost revenue and neighboring land devaluation. A recent study by the *National Vacant Properties Campaign* has shown that houses close to vacant or abandoned property experienced a net loss of over $7,500 each. There are countless examples of other major city's struggling with vacant and abandoned properties since they have a perpetual nature in creating evermore problems. It starts by having caring citizens leave the surrounding areas and ends with the site bringing on to itself evermore dangerous and illegal activities, such a gangs and drug dealing. In order fix this problem from escalating the site needs to be developed and integrated as part of the community so that the city and its residence are not left to burden the cost of doing nothing.

G. This IPRO is unique in the fact that we were not given a proposed implementation outline. Really, we will be creating our own implementation outline during the semester to hopefully propose to a developer.

H. Throughout our research we will have periodic guidance from Eric Ellingsen MA MLA and hopefully from the father of the Vertical farm idea, Dr. Dickson Despommier Ph.D. These professionals have focused a large amount of their research in the last two years to the various elements of vertical and urban farming, and most of their findings and promising designs can be found on http://www.verticalfarm.com/ which is maintained by Professor Despommier and can be considered a 100% reliable source. Conceptual designs have been made by various graduate students; "The Living Skyscraper" by Blake Kurasek, "Living Tower" by SOA Architects, "Eco-Laboratory" by Weber Thompson, "Pyramid Farm" by Ellingsen – Despommier, "SkyFarm" by Gordon Graff, but no physical building has yet to be built.

I. See next page.



US Census 2000 Employment Summary

FreeDemographics™
A Product of SRC

Geography: 60616 Chicago

2000 Occupation & Employment

Not in Labor Force	14,858	39.3%
In Labor Force	22,957	60.7%
Employed	19,377	84.4%
Unemployed	3,565	15.5%
In Armed Forces	15	0.1%

Means of Transportation to Work

Workers Age 16+	19,392
Bicycle	0.4%
Bus or trolley bus	19.1%
Carpooled	19.7%
Drove alone	43.0%
Ferryboat	0.0%
Motorcycle	0.1%
Other means	0.6%
Railroad	0.5%
Streetcar or trolley car	0.3%
Subway or elevated	4.3%
Taxicab	0.2%
Walked	9.9%
Worked at home	1.9%

Travel Time to Work

Median Travel Time To Work in Minutes	27
Less than 5	2.7%
5 to 9	6.6%
10 to 14	11.1%
15 to 19	12.3%
20 to 24	14.2%
25 to 29	5.1%
30 to 34	18.8%
35 to 39	2.9%
40 to 44	3.5%
45 to 59	9.7%
60 to 89	7.3%
90 or more	4.0%
Worked at home	1.9%

Employment by Occupation: Sorted Descending By Percent

Aircraft and traffic control occupations	0.0%
Architects surveyors cartographers and engineers	1.3%
Accommodation and food services	13.7%
Administrative and support and waste management services	3.4%
Agriculture forestry fishing and hunting	0.1%
Arts entertainment and recreation	1.7%
Arts design entertainment sports and media occupations	2.4%
Building and grounds cleaning and maintenance occs	2.5%
Business operations specialists	2.7%
Community and social services occupations	1.8%
Computer and mathematical occupations	3.5%
Construction trades workers	2.6%
Drafters engineering and mapping technicians	0.5%
Education training and library occupations	5.1%

Employment by Industry: Sorted Descending By Percent

Construction	3.2%
Educational services	9.3%
Finance and insurance	6.5%
Health care and social assistance	9.5%
Information	3.2%
Management of companies and enterprises	0.1%
Manufacturing	10.9%
Mining	0.1%
Other services (except public admin)	5.0%
Professional scientific and technical services	7.8%
Public administration	6.1%
Real estate and rental and leasing	2.1%
Retail trade	8.2%
Transportation and warehousing	5.8%

Extraction workers	0.0%	Utilities	1.0%
Farmers and farm managers	0.1%	Wholesale trade	2.3%
Farming fishing and forestry occupations	0.1%		
Financial specialists	2.7%		
Fire fighting and law enforcement incl supervisors	1.8%		
Food preparation and serving related occupations	10.2%		
Health diag and treating practitioners and technical occs	3.5%		
Health technologists and technicians	0.9%		
Healthcare support occupations	1.6%		
Installation maintenance and repair occupations	2.1%		
Legal occupations	1.4%		
Life physical and social science occupations	1.5%		
Management occupations except farmers and farm managers	8.4%		
Material moving workers	2.3%		
Motor vehicle operators	2.7%		
Office and administrative support occupations	17.0%		
Other protective service workers including supervisors	1.4%		
Personal care and service occupations	2.3%		
Production occupations	6.9%		
Rail water and other transportation occupations	0.4%		
Sales and related occupations	9.9%		
Supervisors construction and extraction workers	0.4%		
Supervisors transportation and material moving workers	0.1%		

If you are looking for more current demographic data, DemographicsNow provides quarterly population estimates, current year estimates and 5 year population projections. Go to www.demographicsnow.com.

US Census 2000 Housing Detail Summary

FreeDemographics™
A Product of SRC

Geography: 60616 Chicago

Population & Household Summary	
Family Population	33,329
Group Quarters Population	2,830
Households	19,162
Non Family Households	9,081
Non-Family Population	4,019
Population	46,858

Household Population Summary	
Household Population	44,028
Family Population	33,329
Householders in Family Population	10,081
% Male Householders	58.8%
% Female Householders	41.4%
Spouses of Hhldr	6,076
Children of Hhldr	12,528
% Natural-born or Adopted	98.3%
% Stepchildren	1.7%
Grandchildren of Hhldr	984
Siblings of Hhldr	897
Parent of Hhldr	830
Other Relatives of Hhldr	1,173
Non-Relatives of Hhldr	741
Non-Family Population	10,699
Male Hhldrs in Non-Family Population	4,019
% Living Alone	83.2%
% Not Living Alone	16.8%
Female Hhlders in Non-Family Population	5,124
% Living Alone	90.1%
% Not Living Alone	9.9%
Non-Relatives in Non-Family Population	1,556

Household Summary	
Family Households	10,081
Married Couple	6,067
% With Own Children < 18	44.6%
% Without Own Children < 18	55.4%
Female Hhldr, No Husband Present	3,197
% With Own Children < 18	54.1%
% Without Own Children < 18	45.9%
Male Hhldr, no wife present	816
% With Own Children < 18	34.9%
% Without Own Children < 18	65.1%
Nonfamily Households	9,081

Household Income	
Average Household Income	$43,287
Median Household Income	$31,316
Per Capita Income	$17,701

Household Income	
$ 0 - $9,999	22.9%
$ 10,000 - $14,999	7.5%
$ 15,000 - $19,999	6.3%
$ 20,000 - $24,999	6.3%
$ 25,000 - $29,999	5.5%
$ 30,000 - $34,999	6.1%
$ 35,000 - $39,999	5.4%
$ 40,000 - $44,999	5.4%
$ 45,000 - $49,999	3.4%
$ 50,000 - $59,999	7.6%
$ 60,000 - $74,999	8.6%
$ 75,000 - $99,999	6.9%
$100,000 - $124,999	3.5%
$125,000 - $149,999	2.0%
$150,000 - $199,999	1.2%
$200,000 +	1.5%

Household Size	
1 Person Households	41.2%
Person Female Householder	58.0%
Person Male Householder	42.0%
2 Person Households	25.2%
3 Person Households	14.0%
4 person Households	10.6%
5 Person Households	5.1%
6 Person Households	2.7%
7+ Person Households	1.6%

If you are looking for more current demographic data, DemographicsNow provides quarterly population estimates, current year estimates and 5 year population projections. Go to www.demographicsnow.com.

US Census 2000 Housing Value Summary

FreeDemographics™
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Geography: 60616 Chicago

Housing Units 2000	
Housing Units	21,971
Owner-Occupied	23.6%
Renter-Occupied	63.6%
Vacant	12.8%
Vacant Housing Units	
For Migrant Workers	0.0%
For Rent	45.9%
For Sale Only	6.4%
For Seasonal, Recreation or Occasional	2.4%
Other	33.3%
Rented or Sold, Not Occupied	12.0%
Year Moved In	
1969 or earlier	9.0%
1970 to 1979	7.2%
1980 to 1989	14.7%
1990 to 1994	15.3%
1995 to 1998	32.8%
1999 to March 2000	21.0%
Housing Value: Owner Occupied	
$ 0 to $10,000	0.9%
$ 10,000 to $14,999	1.5%
$ 15,000 to $19,999	1.6%
$ 20,000 to $24,999	0.4%
$ 25,000 to $29,999	0.0%
$ 30,000 to $34,999	0.0%
$ 35,000 to $39,999	0.0%
$ 40,000 to $49,999	1.5%
$ 50,000 to $59,999	0.8%
$ 60,000 to $69,999	1.4%
$ 70,000 to $79,999	2.5%
$ 80,000 to $89,999	3.6%
$ 90,000 to $99,999	3.2%
$ 100,000 to $114,999	12.5%
$ 115,000 to $149,999	12.3%
$ 150,000 to $174,999	14.4%
$ 175,000 to $199,999	10.3%
$ 200,000 to $249,999	14.6%
$ 250,000 to $299,999	10.1%
$ 300,000 to $399,999	5.7%
$ 400,000 to $499,999	1.2%
$ 500,000 to $749,999	1.2%
$ 750,000 to $999,999	0.1%
$1,000,000 or more	0.1%
Median Housing Value	$172,852

Year Structure Built	
Built 1939 or earlier	31.2%
Built 1940 to 1949	8.5%
Built 1950 to 1959	17.2%
Built 1960 to 1969	17.4%
Built 1970 to 1979	10.9%
Built 1980 to 1989	4.7%
Built 1990 to 1994	3.0%
Built 1995 to 1998	4.8%
Built 1999 to March 2000	2.3%
Units in Structure	
1 - Attached Unit	6.0%
1 - Detached Unit	8.1%
2 Units	14.2%
3 - 4 Units	13.0%
5 - 9 Units	7.4%
10 - 19 Units	3.5%
20 - 49 Units	7.2%
50 or more Units	40.4%
Boat, RV, Van, etc	0.0%
Mobile Home/Trailer	0.0%
Rent: Cash Rent	
$ 0 to $100	5.6%
$ 100 to $149	9.8%
$ 150 to $199	4.3%
$ 200 to $249	3.0%
$ 250 to $299	4.4%
$ 300 to $349	3.4%
$ 350 to $399	5.3%
$ 400 to $449	8.2%
$ 450 to $499	3.4%
$ 500 to $549	9.1%
$ 550 to $599	6.0%
$ 600 to $649	4.9%
$ 650 to $699	5.9%
$ 700 to $749	7.7%
$ 750 to $799	2.7%
$ 800 to $899	5.4%
$ 900 to $999	3.9%
$1,000 to $1,249	3.6%
$1,250 to $1,499	0.7%
$1,500 to $1,999	0.3%
$2,000 or more	0.0%
No Cash Rent	2.3%
Total Rental Units	13,969
Median Cash Rent	$524

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US Census 2000 Overview Summary

FreeDemographics™
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Geography: 60616 Chicago

Population Summary	
Total Population	46,858
Female Population	52.2%
Male Population	47.8%
Race & Ethnicity	
American Indian, Eskimo, Aleut	0.4%
Asian	29.5%
Black	37.2%
Native Hawaiian/Other Pacific Islander	0.1%
White	26.7%
Other	4.4%
Two or More Races	1.7%
Hispanic Ethnicity	9.7%
Not Hispanic or Latino	90.4%
Educational Attainment	
Nursery School - 8	11.7%
9th to 12th grade, no diploma	16.8%
High School Graduate	21.4%
Associates Degree	4.2%
Some College, No Degree	17.8%
Bachelor's Degree	14.0%
Graduate Degree	10.7%
No Schooling	3.4%
Age: Total	
Age 0 - 4	6.3%
Age 5 - 9	6.5%
Age 10 - 13	4.5%
Age 14 - 17	3.9%
Age 18 - 20	5.5%
Age 21 - 24	6.9%
Age 25 - 29	9.3%
Age 30 - 34	8.5%
Age 35 - 39	7.8%
Age 40 - 44	7.1%
Age 45 - 49	6.4%
Age 50 - 54	5.4%
Age 55 - 59	4.0%
Age 60 - 64	3.8%
Age 65 - 69	3.8%
Age 70 - 74	3.8%
Age 75 - 79	2.8%
Age 80 - 84	1.9%
Age 85+	1.8%
Median Age	34.2
Age 15 + Population	38,294

Household Summary	
Total Households	19,162
Median Household Income	$31,316
Average Household Income	$43,287
Per Capita Income	$17,701
Median Housing Value	$172,852
Avg Monthly Contract Rent	$491
Income by Type: Household Income	
$ 0 - $9,999	22.9%
$ 10,000 - $14,999	7.5%
$ 15,000 - $19,999	6.3%
$ 20,000 - $24,999	6.3%
$ 25,000 - $29,999	5.5%
$ 30,000 - $34,999	6.1%
$ 35,000 to $39,999	5.4%
$ 40,000 to $44,999	5.4%
$ 45,000 to $49,999	3.4%
$ 50,000 - $59,999	7.6%
$ 60,000 - $74,999	8.6%
$ 75,000 - $99,999	6.9%
$100,000 - $124,999	3.5%
$125,000 - $149,999	2.0%
$150,000 - $199,999	1.2%
$200,000 +	1.5%
Size of Household	
1 Person Households	41.1%
2 Person Households	25.2%
3 Person Households	14.0%
4 Person Households	10.6%
5 Person Households	5.1%
6 Person Households	2.7%
7+ Persons	1.6%
Year Moved In	
1969 or earlier	9.0%
1970 to 1979	7.2%
1980 to 1989	14.7%
1990 to 1994	15.3%
1995 to 1998	32.8%
1999 to March 2000	21.0%
Housing Stability (5 Year)	48.5%
Housing Turnover (1 Year)	22.4%

Marital Status

Married	33.6%
Divorced	9.7%
Never Married	36.4%
Separated	12.7%
Widowed	7.6%

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4. Team Values Statement

1. Each team member should be accountable for the work they agree to do.
2. Each team member should take initiative and should always be looking for ways they can contribute their skills.
3. Each team member should be present and on time to all meetings, whether they be during or outside of class time.
4. Each team member should treat the other members with respect and listen to one another's ideas.
5. Each team member should take ownership of this project, and be enthusiastic to complete it well.

When problems arise throughout the duration of this project, we hope to resolve them by communicating honestly with one another. We will take advantage of our group meeting times to brainstorm solutions. We will also use iGroups and email for those times when the group is unable to meet. We hope by using this methods we will be successful in collaborating to solve problems throughout our project.

5. Work Breakdown Structure

A. First we will identify, evaluate and prioritize possible options for the Michael Reese site. Shortly after we will break the project into our main focus building and the rest of the site. The architects will begin designing a building while the civil & business research zoning, ordinances, and economical impacts. There will be cost estimates for each building as well as an economical assessment of the amount of revenue each business will generate.

B. Team Leader – Will Pattermann

Sub-Teams
1. Architecture Design Team
2. Civil Design Team
3. Design Teams

Sub-Team Leaders
A. Matt – Architecture Design Leader
B. Karen - Civil Design Leader
C. Zach – Business Leader

Sub-Team's Responsibilities:
A. Design/Build the layout and model for our site
B. Design the structure for the building.
C. Develop and create an overall business plan for the site. This includes the information that the Architects and Civil Engineers create.

Poster Sub-Team Responsibilities:
- Design our presentation poster to requirements with our researched information.

Brochure Sub-Team Responsibilities:
- Design our presentation brochure to requirements with our researched information.

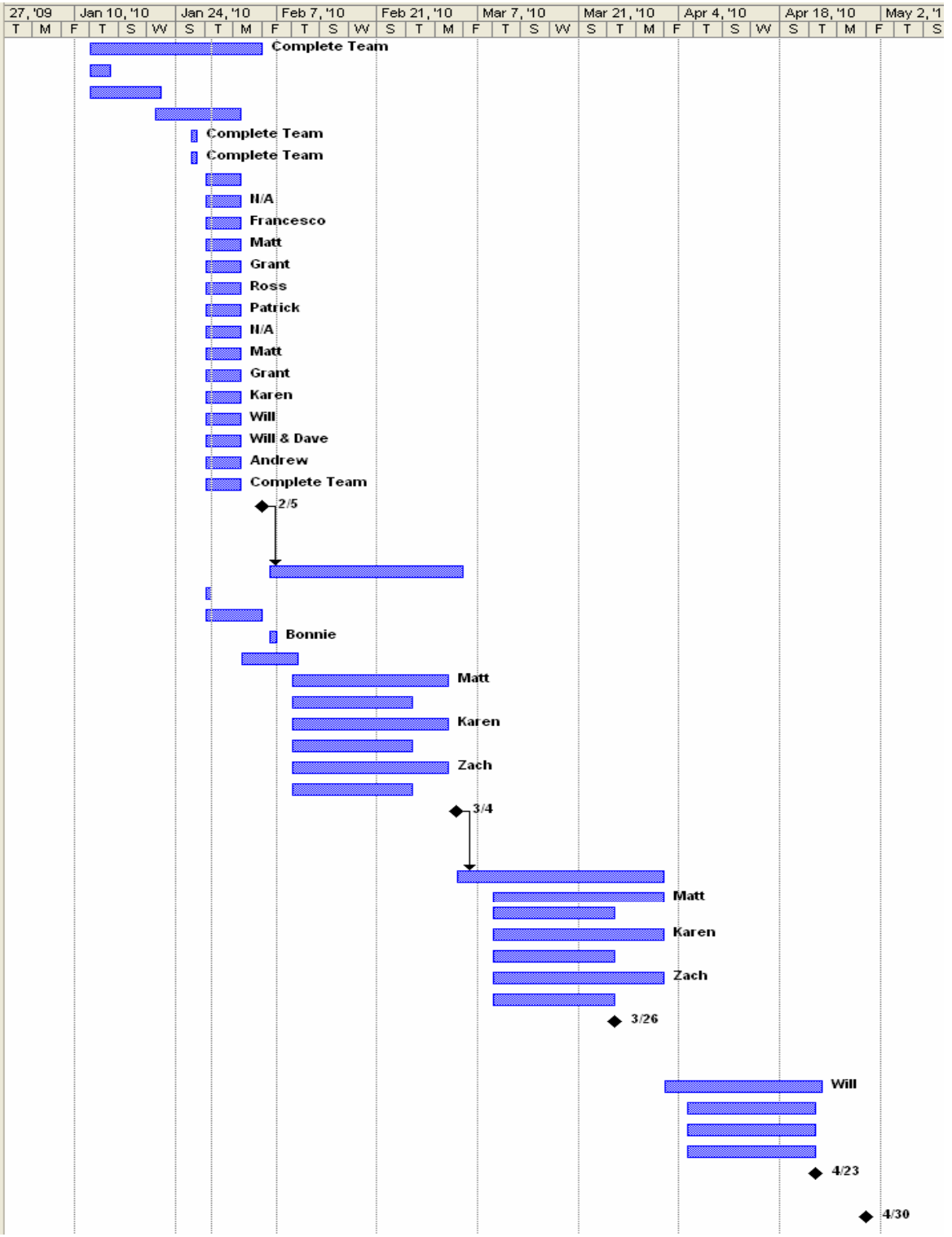
C.

Required Deliverables:	**Due Date:**
Project Plan	Feb. 5th by midnight (uploaded to iKnow)
Midterm Review Presentation Slides	Uploaded to iKnow on the day of review (March 4th)
Ethics Reflective Report	March 26th by midnight (uploaded to iKnow)
Final Project Report (Draft #1)	April 9 by midnight in iKnow
Abstract/Brochure	April 19 by 10:00 am in iKnow
Poster	April 19 by 10:00 am in iKnow
Final Presentation Slides	April 22 by 10:00 am in iKnow
Website (optional)	Determined by instructor
Meeting Minutes (optional)	Determined by instructor
Final Project Report (Final Draft)	April 30th by midnight (uploaded to iKnow)
IPRO Deliverables CD (if applicable)	Turned in April 30th by midnight
Individual Project Analysis Report (optional)	Specified by instructor
Individual Project Logbook (optional)	Specified by instructor

Optional Deliverables:

Business Plan
Code of Ethics
Engineering Notebook
Individual Reports
Meeting Minutes
Peer Reviews
Project Notebook
Website

	Task Name	Duration	Start	Finish	Resource Names
1	Project Organization	18 days	Tue 1/12/10	Thu 2/4/10	Complete Team
2	Define the Project	3 days	Tue 1/12/10	Thu 1/14/10	
3	Determine Project Requirements	8 days	Tue 1/12/10	Thu 1/21/10	
4	Make Project Plan	8 days	Thu 1/21/10	Mon 2/1/10	
5	Team Information	1 day	Tue 1/26/10	Tue 1/26/10	Complete Team
6	Team Purpose & Objectives	1 day	Tue 1/26/10	Tue 1/26/10	Complete Team
7	Background	3 days	Thu 1/28/10	Mon 2/1/10	
8	Part A	3 days	Thu 1/28/10	Mon 2/1/10	N/A
9	Part B	3 days	Thu 1/28/10	Mon 2/1/10	Francesco
10	Part C	3 days	Thu 1/28/10	Mon 2/1/10	Matt
11	Part D	3 days	Thu 1/28/10	Mon 2/1/10	Grant
12	Part E	3 days	Thu 1/28/10	Mon 2/1/10	Ross
13	Part F	3 days	Thu 1/28/10	Mon 2/1/10	Patrick
14	Part G	3 days	Thu 1/28/10	Mon 2/1/10	N/A
15	Part H	3 days	Thu 1/28/10	Mon 2/1/10	Matt
16	Part I	3 days	Thu 1/28/10	Mon 2/1/10	Grant
17	Team Values Statement	3 days	Thu 1/28/10	Mon 2/1/10	Karen
18	Work Breakdown Structure	3 days	Thu 1/28/10	Mon 2/1/10	Will
19	Expected Results	3 days	Thu 1/28/10	Mon 2/1/10	Will & Dave
20	Project Budget	3 days	Thu 1/28/10	Mon 2/1/10	Andrew
21	Designation of Roles	3 days	Thu 1/28/10	Mon 2/1/10	Complete Team
22	Project Plan Due	0 days	Fri 2/5/10	Fri 2/5/10	
23					
24					
25	Mid-Term Sub-Team Tasks	20 days	Sat 2/6/10	Thu 3/4/10	
26	Sub-Team Divisions Finalized	1 day	Thu 1/28/10	Thu 1/28/10	
27	Gather Initial Research/Background	6 days	Thu 1/28/10	Thu 2/4/10	
28	Trip to MSI Vertical Farm Exhibit	1 day	Sat 2/6/10	Sat 2/6/10	Bonnie
29	Design Master Layout	7 days	Tue 2/2/10	Tue 2/9/10	
30	Architecture Sub-Team	16 days	Tue 2/9/10	Tue 3/2/10	Matt
31	Develop Building Layout	13 days	Tue 2/9/10	Thu 2/25/10	
32	Civil Sub-Team	16 days	Tue 2/9/10	Tue 3/2/10	Karen
33	Research Zoning and Requirements	13 days	Tue 2/9/10	Thu 2/25/10	
34	Business Sub-Team	16 days	Tue 2/9/10	Tue 3/2/10	Zach
35	Determine Economic Needs	13 days	Tue 2/9/10	Thu 2/25/10	
36	Mid-Term Review Presentations	0 days	Thu 3/4/10	Thu 3/4/10	
37					
38					
39	IPRO Final Sub-Team Tasks	21 days	Thu 3/4/10	Thu 4/1/10	
40	Architecture Sub-Team	18 days	Tue 3/9/10	Thu 4/1/10	Matt
41	Model Building & Renderings	13 days	Tue 3/9/10	Thu 3/25/10	
42	Civil Sub-Team	18 days	Tue 3/9/10	Thu 4/1/10	Karen
43	Structural Drawings	13 days	Tue 3/9/10	Thu 3/25/10	
44	Business Sub-Team	18 days	Tue 3/9/10	Thu 4/1/10	Zach
45	Buisness Plan	13 days	Tue 3/9/10	Thu 3/25/10	
46	Ethics Reflective Report Due	0 days	Fri 3/26/10	Fri 3/26/10	Individual
47					
48					
49	IPRO Presentation Teams	16 days	Fri 4/2/10	Fri 4/23/10	Will
50	Exhibit & Poster	14 days	Mon 4/5/10	Thu 4/22/10	
51	Abstract & Brochure	14 days	Mon 4/5/10	Thu 4/22/10	
52	Prepare for IPRO	14 days	Mon 4/5/10	Thu 4/22/10	
53	Presentation (IPRO Day)	0 days	Fri 4/23/10	Fri 4/23/10	
54					
55	PROJECT COMPLETION	0 days	Fri 4/30/10	Fri 4/30/10	



6. Expected Results

A. IPRO 356's expected activities are to visit the Museum of Science and Industry to attend the vertical farm exhibit sometime in February and conduct initial research into vertical farm operations in order to gain a better understanding of how to best construct this project. Ideally, we will be able to develop a business plan for the entire Michael Reese site that will benefit the community and continue to preserve the strong architecture that can be seen throughout Chicago.

B. We expect to find that the community is in dire need of improvement. This gives us great optimism that we will be able to help. The site is a prime location of the community, so any change that we choose to make will have a large impact on the surrounding society.

C. Some potential products are retail stores, supermarkets, fire stations, police stations, museums, fitness centers, restaurants, high-rise apartments, architectural tourist attraction, IIT expansion, Presidential Library, etc.

D. As the project progresses, we will have 3 distinct groups collaborating, and identifying changes that need to be made to our initial plan. As we gain more information on cost, profits, and drawbacks from each form of business,

E. Our deliverables will consist of a site model with 3D renderings. We will have a full set of structural plans for the Vertical Farm, and a master layout with business plan for the rest of the site.

F. A major challenge that can be anticipated with this IPRO is the zoning laws associated with the vertical farm. Chicago is a city heavily sanctioned by zoning ordinances. This will cause a challenge because there is not much precedent set for vertical farms especially in the Midwest. A lot of research will have to be dedicated to figuring out which permits and whatnot will be needed for the construction of a vertical farm in Chicago. This may also turn into one of the necessary assumptions that will be made. If not enough information can be located, this IPRO will need to make the decisions in this regard. Another challenge associated with this IPRO will be how to utilize the rest of the Michael Reese site. The vertical farm will be the anchor of the site and decisions will need to be made as to what will occupy the remainder of the site.

G. Our expected results will govern how to run the project. Any research that we find relevant to creating a profit, enhancing the community, or providing innovation for the future will be incorporated into our design of the site.

7. Project Budget

Supplies (Lab supplies, office supplies, etc.)

$660

In order to effectively present the vertical farm, the architects of the group proposed to create a model that will aid the viewers to envision what the proposed site would look like. In order to create this model the following materials were needed: Glue, plywood, handles, basswood, MDF, chipboard, acrylic, spray paint, filter fabric, dowels, C clamps, exacto blades, and sandpaper. (Materials-$500)

Printing drafts to print for class discussions and also for the large poster boards also required. (Printing money-$160)

Travel/Meetings (Transportation costs, passes, etc.)

$344

Transportation was also required to observe the site and to also pick up the materials needed for the model. (Gas-$40)

To better knowledge ourselves about the design of the vertical farm, a trip to the Museum of Science and Industry was agreed. To enter, each ticket cost $15 and transportation was also required to arrive at the museum. (tickets-$240, Parking-$64)

Driving directions to Museum of Science and Industry, 10.1 mi – about 22 mins (up to 40 mins in traffic)

From:	3241 S Federal St Chicago, IL 60616	1. Head south on S Wabash Ave toward E 33rd Blvd	328 ft
		2. Take the 1st left onto E 33rd Blvd	0.2 mi
		3. Turn left at the 2nd cross street onto S Indiana Ave	0.3 mi
To:	Museum of Science & Industry	4. Take the 2nd right onto E 31st St	0.7 mi
		5. Turn right to merge onto S Lake Shore Dr/US-41 S	3.8 mi
		6. Turn right at E Columbia Dr Cutoff	381 ft
		7. Turn right at Columbia Dr	0.2 mi
		8. Turn left at E Museum Dr	Arrival

Budget for Museum of Science and Industry Trip

Driving: 10.1 miles one way, two directions, 4 vehicles = 80.8 miles total

Federal rate for 2008 is 50.5 cents per mile.

Total reimbursement for team equals 80.8 miles x 49.5 cents = $40.00

Miscellaneous

For out of class meetings and gatherings, meals will be provided for the students (16 students). (Meals-$200)

Participation Support (Incentives to participants of usability testing, product testing, user survey, focus groups, etc.)

No money is needed for participation support.

Total Reimbursement: $1240.00

8. Designation of Roles

A. Meeting roles:
   - **Minute Taker**: Not needed, we are separated into our groups for almost every meeting; this will make one set of cohesive notes unachievable.
   - **Agenda Maker**: Will Pattermann, formal agendas will not be needed.
   - **Time Keeper**: Will Pattermann
   - **iGroups Moderator**: Will Pattermann