

Project Plan Report

IPRO Team 335 Fall 2004

Project Objectives:

The objective of IPRO-335 this semester is to design a small airport that will serve several communities. Specific objectives are as follows: 1) Overall design layout for the building, control tower, parking lot, runway and taxiway. 2) Architectural design of the building 3) Structural design of the building 4) Electrical and lighting systems 5) Plumbing and HVAC design 6) Acoustic issues and designing 7) Cost estimating

Project Background:

This integrated design course involves a complete design of a building considering all architectural engineering aspects. This project requires and involves:

- 1) Selection of the type of structure to be used
- 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) Building comfort requirements including the design of a heating, ventilation and air conditioning system depending on the building occupancy and usage
- 4) Design of the electrical and lighting systems and deal with acoustic issues
- 5) Preparation of detailed drawings
- 6) Estimate the building cost

Research Methodology:

The project will follow the method as outlined in the "Task Schedules/Milestones" page.

To summarize:

- 1) Develop the architectural design and select the structure types
- 2) Structural analysis
- 3) HVAC design
- 4) Plumbing design
- 5) Lighting and acoustic designs

- 6) Building serviceability and design other components of the airport
- 7) Review overall design and modify as necessary
- 8) Estimate cost For each stage of development, an evaluation of the analysis and design will be conducted for possible improvement and minor changes.

The following is a list of resources that we will use and consult with for the project:

- 1) Books from the Architectural library in Crown Hall
- 2) Lectures by our instructors (Prof. Mohammadi, Prof. Megri, and Prof. Muehleisen)
- 3) Internet
- 4) Building design standards and codes: American Concrete Institute, American Institute of Steel Construction, International Building Code, ASHRAE Handbooks, and relevant design manuals for lighting and electrical systems in buildings

Expected Results:

The following deliverables will be produced by the team members through the execution of the tasks as outlined in "Task Schedules/Milestones."

- 1) Complete architectural drawings
- 2) Complete calculation report for structural and foundation design, HVAC and plumbing design, lighting and acoustic design, and cost estimation
- 3) Website, poster, and a PowerPoint presentation In addition, other issues that were not addressed in the project (such as future expansion of the airport, etc.) will be discussed for future reference.

Project Budget:

Schedule of Tasks and Milestone Events:

Week 1: Introduction of the project and identification of the tasks

Week 2: Development of architectural design, selection of structure types and approval by the client

Week 3: Building envelope design, start of structural analysis

Week 4: Structural design (continued), foundation design completed

Week 5: Lecture on HVAC design; start of HVAC design

Week 6: HVAC design (continued); start on plumbing design

Week 7: HVAC and plumbing design completed; lecture on lighting and acoustic design

Week 8: Lighting and acoustic design

Week 9: Lighting and acoustic design (continued); web site design completed
Week 10: Building service reviews; parking lot design, runway and taxiways
Week 11: Parking lot, runway and taxiway design and lighting system completed
Week 12: Overall design review and evaluation
Week 13: Cost estimating and bill of materials
Week 14: Cost estimating finalized; begin preparation of presentation materials
Week 15: Final report and presentation

Individual Team Member Assignments:

Since our IPRO team consists of only 6 students, each member will be covering multiple tasks and/or a task maybe distributed to several team members. As a guideline, the following tasks have been assigned to the relevant experts (majors).

John Doles: Structural analysis and design, foundation design, and site/civil engineering design

Dan Rehberg: HVAC and plumbing design

Janet Martinez: HVAC and plumbing design

Hana Ishikawa: Architectural design

Mihdi Vahedi: Architectural design codes, HVAC design, lighting and acoustic design, and website

Raquib Pramanik: Structural analysis, HVAC design, acoustic issues and design, runway/taxiway design