

GROUP PROJECT 1 | TECHNICAL REPORT

INTERDISCIPLINARY PROJECT

ARCHITECTURE, MECHANICAL ENGINEERING AND CONSTRUCTION

DUE DATE: THURSDAY, FEBRUARY 16 | 11:59 PM

Design and construction of buildings, particularly sustainable and resilient buildings, require interdisciplinary knowledge and the ability of various professionals to work together in solving problems. The goal of this project is to introduce Architecture, Construction and Mechanical Engineering students to this collaborative process through teamwork.

This project is focused on climate responsive design and construction in relation to siting and placement of a building, as well as the impact on soil and the foundation.

Preparation, Discussions and Analysis of SIPA Building

Working as team visit SIPA building on FIU's main campus for an onsite investigation in relation to the topics of the table on page 2 of this document. Working with your team, document your site visit with photographs, sketches, and notes for an analysis of the building. Address and respond to the factors on each row of the table.

To conduct the project, you can arrange to meet with your team as many times as you need, however you should arrange one of your meetings to discuss the project at the SET lab PCA131 in one of the following dates and select your desired time slot.

Friday Feb. 3 RD	6:00pm -8:00pm
Saturday Feb. 4 th	10:00am -12:00pm
Saturday Feb. 4 th	12:00pm -14:00pm

Analyzing the Building in a New Context and Location

Relocate and rethink the design and construction of SIPA building in the cold climatic zone of Chicago, Illinois- The building will be utilized by the Illinois Institute of Technology located at *South Wabash Avenue and East 33rd street*. To complete the assignment, answer the same questions provided in the table by considering "What must be changed to make the building climate responsive to the new site?"

Submission Format:

The report should be in 8-1/2 x 11 format. Please include the following on your report:

- 1) Cover Page (including group number)
- 2) Table of Contents with page numbers
- 3) Content:

Part 1 – Gather your analysis of the existing conditions of the SIPA building to evaluate the possible environmental strategies of the building.

Address all the specified requirements for all factors in the chart below.

Part 2 – Learning from the analysis of the existing building, rethink and propose strategies to efficiently adapt to the environmental conditions of a new site and different climate.

- 4) Bibliography
- 5) Completed project review (survey)

Submission Requirements:

Your submission of the technical report must include text, drawings, and calculations as required per table here for the existing condition.

Each team will submit a single report in pdf format via email to Giovanna Gallardo: ggall026@fiu.edu by 11:59 PM on Thursday, February 16th.

Categories	Factors	Description
Climate	Temperature	How does the outside temperature play a role in building design? (i.e. material selection, building form and configuration...) <i>200-250 words</i>
	Humidity & Precipitation	How humidity and precipitation affect the building design? (i.e. roof configuration, rain management and drainage, water proofing, foundation, ...) <i>200-250 words + Diagrams</i>
Orientation	Energy Performance	Is the building orientation appropriate for minimizing heat gain in the building? Describe how. <i>75-100 words+ Diagrams</i>
	Access to Natural Light	What is the relationship between sun path and building openings? (i.e. courtyard, windows, clerestory windows, skylights, light-wells, ...) <i>75-100 words + Diagrams</i>
	Prevailing Winds	What is the relationship between prevailing winds and building openings? (cross ventilation, stack ventilation, natural cooling, ...) <i>50 words+ Diagrams</i>
	Ease of Access	Describe the circulation to and from the building in relation to: access to pedestrian crossings, visibility of entrances, elevation changes from outdoor to indoor, etc. <i>Diagrams</i>
	Access to views	What is the relation between openings, views and program layout? (i.e. circulation, classrooms, offices, etc....) <i>Diagrams</i>
Soil	Type	What is the impact of soil type on design and construction system of the building? (i.e. slope, drainage, porosity, landscape surfaces) <i>75-100 words + Diagrams</i>
	Site Work	How soil properties affect the construction process? Estimate the volume of excavated soil and its impact on Carbon foot print of the building? <i>50-100 words+ calculations</i>
	Thermal properties	What are the thermal properties of the soil? <i>50 words</i>
	Water table	How deep is the water table? How does it impact the construction methods? <i>75-100 words</i>
Foundation	Thermal Impact	Estimate the heat transfer through foundation. <i>Calculations (estimated)</i>
	Water Filtration	How the selected foundation allows water to filtrate back to the ground? <i>50 words+ Diagrams</i>