

# Lab-1- Hand Calculation of Load Requirement of a Residential HVAC System

First Draft Due - 4-13-2021

Final Report Due- 4-22-2021

**Objective-** Objective of this lab is to calculate cooling and heating load of the Co-operative building unit. You will need to hand calculate the cooling and heating load based on the thermal insulation properties given on the drawing.

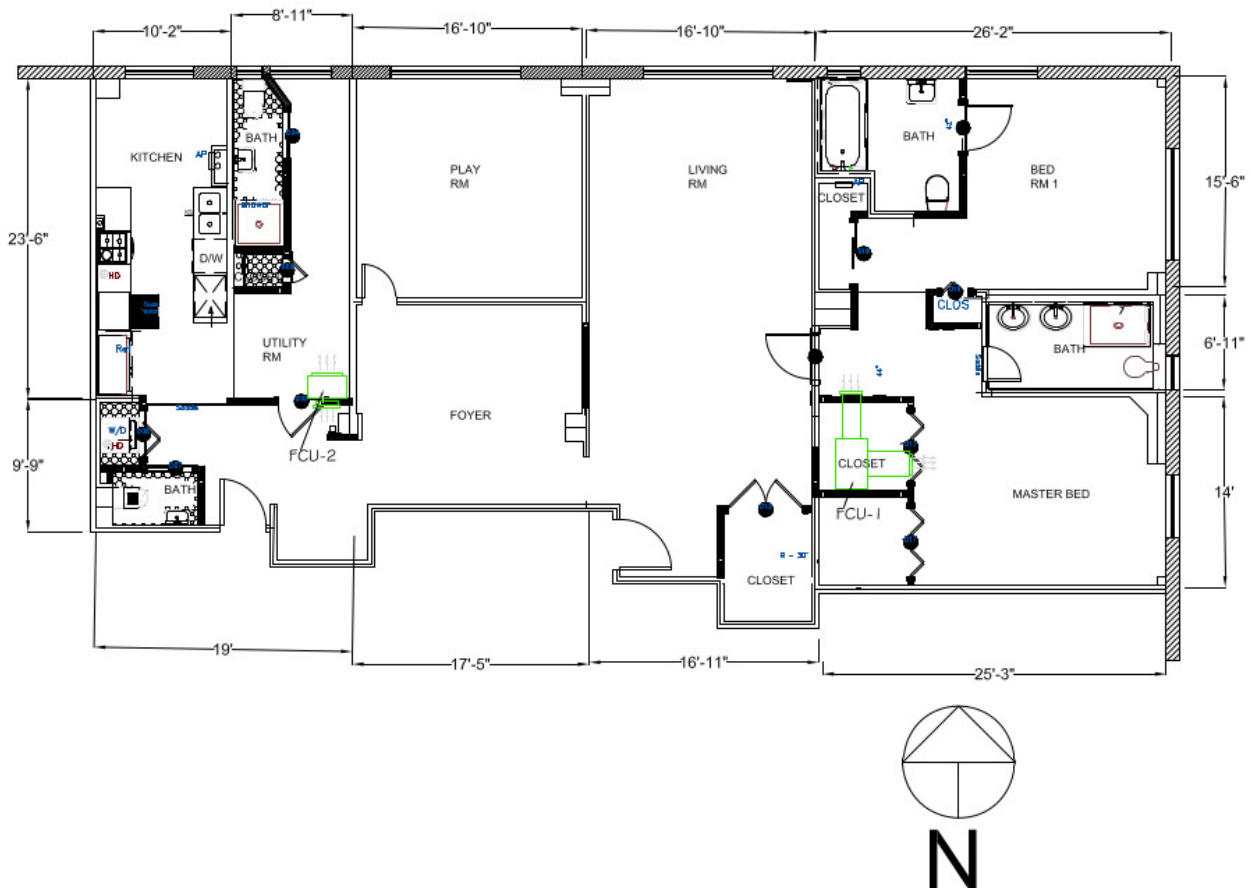


Fig: Co-operative Unit Located in a building in New York City.

## **General assumptions:**

Use ASHRAE Table with the following design conditions to determine the design conditions:

Location: New York, Central Park

Elevation: 8 ft

Heating condition- 99% Outdoor Dry Bulb Temperature=15 °F

Cooling Condition- 1% Dry bulb temperature=96.6 °F

Indoor Design temperature: 75 F

## **Sample Calculation:**

The equation and **Sample** calculation are attached **in the lab section in Openlab**. **Also** sample calculations **are attached in the Appendix**.

A Sample calculation for cooling load is added in Openlab site. Please use this as a reference and present heating/cooling load in a spreadsheet.

## **Report Writing:**

Write a 5-page report including:

### **Cover Page:**

Lab Title

Group Member Name (Contribution%)

Member Name (Contribution%)

Member Name (Contribution%)

1. **Objective**- Clear objective in your own words
2. **Floor plan**- Follow the sample floor plan in openlab appendix
3. **Colling load Calculation**

- a. Procedure- Summarize the calculation procedure (Refer to documents in openlab)
  - b. List Equations
  - c. Show sample calculation of a single room/zone in the main document or appendix
4. **Full Data presentation-** Full Cooling loads of each zone/room should be presented in a spread sheet.
5. **Discussion-** Include your assumptions, findings, missing elements, how could you improve the design.
6. **Selected HVAC units-** Presentation of data/specification
7. **Summary-** Summarize your learning experience, your confidence in HVAC system. Also mention how this lab can help your career.