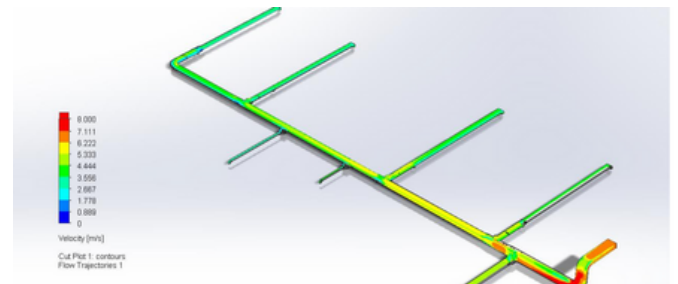
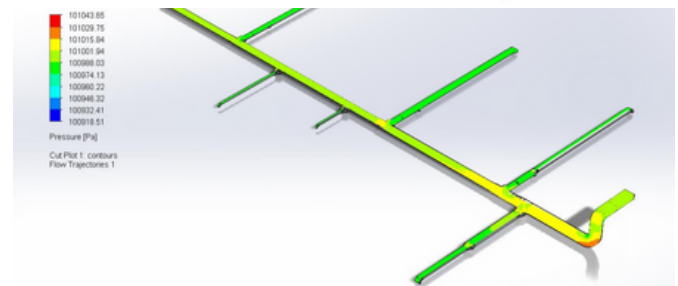
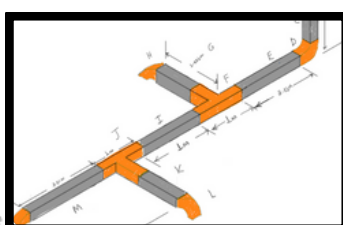
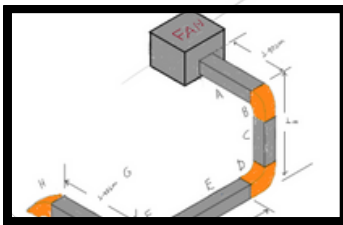
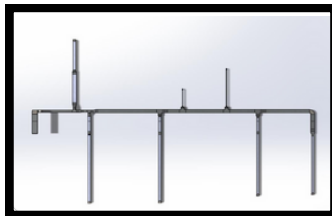
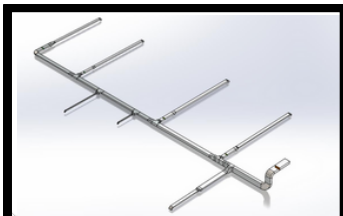
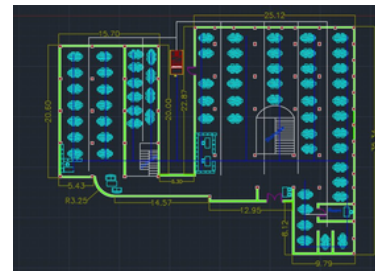


DESIGN OF A VENTILATION SYSTEM FOR THE LIBRARY AT THE ADDIS ABABA INSTITUTE OF TECHNOLOGY (AAIT)



What?

- Designed a **ventilation system** for the **AAiT Library ground floor**, with a focus on functionality for users and the preservation of books and materials.
- Aiming to achieve optimal indoor air quality, the system addresses the specific needs of students and staff engaged in reading, studying, and researching

How?

- Utilized **AutoCAD** software for the floor plan and ventilation system layout.
- Sized air flow rates and ducts per EBCS code based on occupancy, activity level, and space type.
- Applied engineering calculations for fan selection based on the pressure and volume flow rate requirements ,
- Employed **CFD simulations** with SolidWorks Flow Simulation for system optimization and validation, ensuring a comprehensive assessment.

Results

- The design parameters were thoroughly scrutinized against EBCS requirements, ensuring compliance without unnecessary complexity.
- Achieved a total volume flow rate of **1.83 m³/s**, aligning with EBCS code metrics for occupancy activity level, and space type standards.. and a centrifugal fan with **70%** efficiency was chosen, exceeding the minimum requirement of **65%** specified by EBCS.
- Ceiling duct velocities slightly exceeded the recommended **6m/s**, indicating potential noise, pressure loss, and energy consumption concerns but CFD simulations confirmed effective air distribution with a velocity magnitude within acceptable limits.