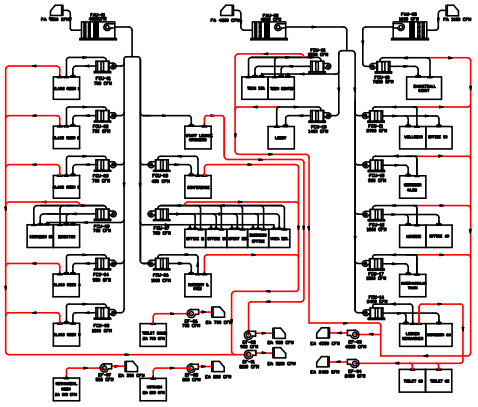
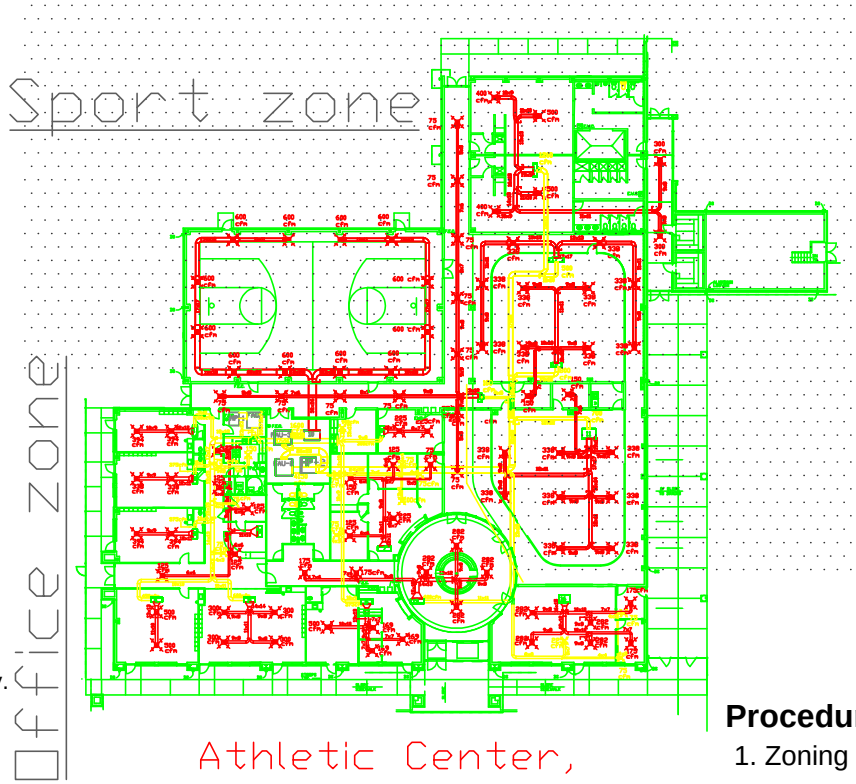
2002 Student Design Competition : HVAC System Design



Duct Diagram



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Team member :

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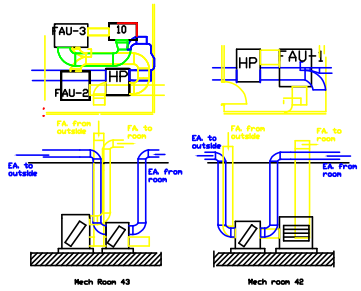
2. Rungrit Maneethai
3. Potchara Tangtragulwong
4. Tirawat Phoomboplab

Advisor : Dr. Tul Maneewattana
Jakrapan Pawangkarat



Heat Pipes

Objective :

1. Thermal comfort
   Appropriate temperature, %RH and air velocity.
2. Indoor Air Quality (IAQ)
   Appropiate F/A quantity to each zone.
3. Energy
   Most effective and energy consumption.
4. Environment
   Least environment impact.
5. Flexibility
   Zoning to be most effective system and future expansion.
6. Odor
   Best air circulation and ventilation, especially in sport zone.
7. Cost
   Reasonable initial and operating cost regard with system efficiency.

Outside condition

Summer : 95? F(DB), 74? F(WB)
Winter : -2? F with no humidity

Designed condition

	Summer	Winter
General zone	75? F,55%RH	72? F,55%RH
Public zone	78? F,55%RH	75? F,55%RH
Sport zone	72? F,55%RH	72? F,55%RH

Procedure & Method :

1. Zoning
   Sport zone: Basketball court, wellness and track
   Office zone: (Low level of activity)
2. Pressurization
   Negative pressure in Sport zone, lounge and toilet.
   Positive pressure in Office zone and Corridor.
3. Air quality control
   CO_2 sensors (control appropiate F/A quantity)
   Thermostats (control appropiate room temperature)
4. System selection
   Air/Water & 4 pipes system
5. Energy recovery (Heat pipe)
   Exchange waste energy from exhaust air to fresh air.