









































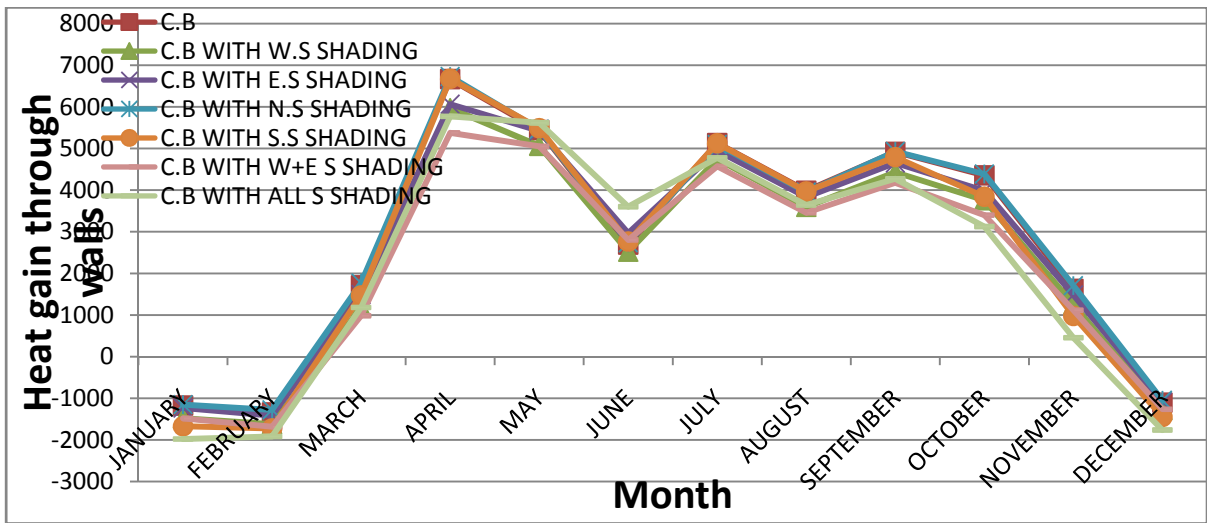
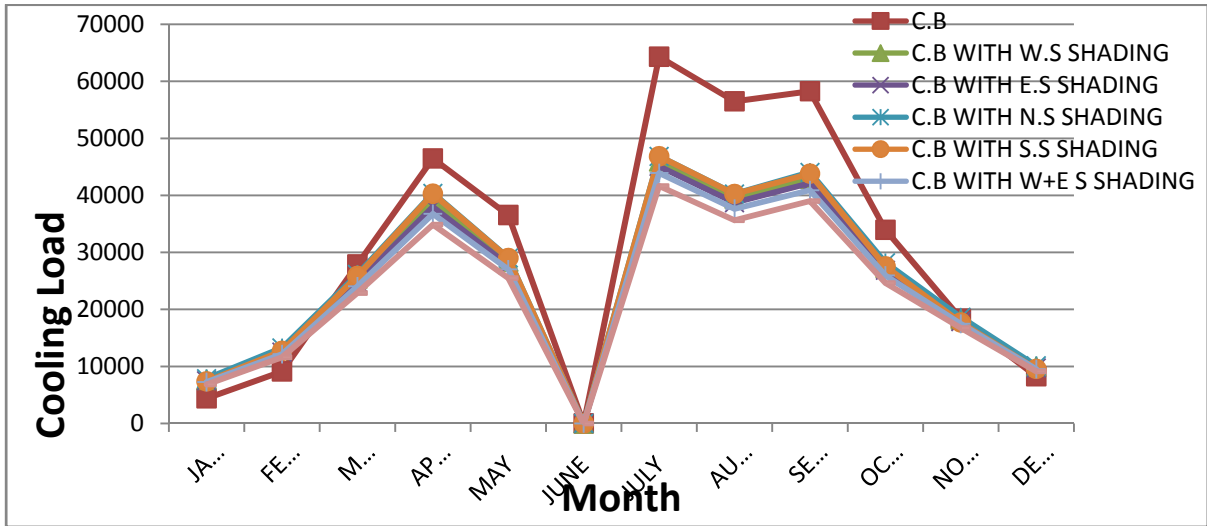








MAY	1816.871	5617.788	1285.001	8137.405	30.72851	-25510.4	1.962776
JUNE	341.5504	3602.96	767.9192	7479.064	33.04787	0	2.603574
JULY	1859.188	4776.145	1133.788	6891.636	27.36381	-41637.5	1.145093
AUGUST	1383.478	3642.749	825.5161	6251.822	26.88387	-35646.8	0.98218
SEPTEMBER	1656.392	4271.344	898.3932	6938.446	26.87329	-39002.4	0.932511
OCTOBER	491.3741	3125.711	477.165	6778.194	26.63255	-24644.1	1.21959
NOVEMBER	-532.096	455.4082	-130.179	5942.482	23.85195	-16757.5	0.510074
DECEMBER	-1393.89	-1760.56	-369.156	4894.177	19.04568	-9142.1	-0.53481



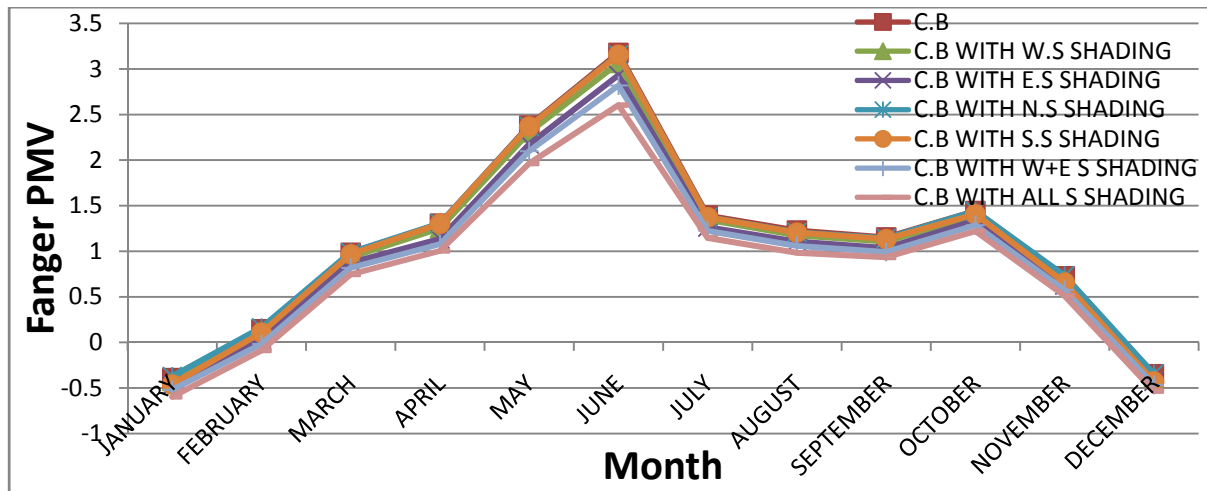


Fig 3.4 (A, B, C) Effect of shading on cooling load, Heat gain through window and Fanger pmv

## 5. CONCLUSION

This paper reveals the effect of rock wool thermal insulation applied to various envelop area of building to heat gains by building envelop and fenestration, to thermal comfort and cooling load. Further effect of adjacent shading on these factors was also evaluated. The major conclusions are as follow.

1. Cooling load with rock wool roof insulation can be decreased upto 2.3% and 4.32%, 4%, 4.42%, 5%, 7.8%, by insulating roof with south wall, east wall, west wall, combined west + south wall and overall outside wall and roof respectively. Whereas effect is not suitable by insulating north wall in this case.
2. By insulating roof with all outside walls 13.57 and % fanger pmv is

improved and if we consider insulation of roof with single wall then west wall shows the maximum positive effect with 8.57% improvement in fanger pmv value, whereas north and south wall shows 7.86% improvement each and combined west and south wall with roof insulation shows 9.29% improvement in fanger pmv which is a measurement of thermal comfort.

3. By insulating the roof by rock wool insulation with 75 mm thickness, heat gain through roof reduces up to 53%.
4. Maximum reduction in heat gain through walls by insulating roof with individual wall is found in west wall and that is 28.4% whereas overall insulation results 77.4% reduction. So for this case insulation should be done to at least west wall.



5. Adjacent shading can be the one of the cheapest solution for improving energy efficiency because it can be done by implanting trees which also has additional direct and indirect advantages. Result shows that for individual side shading maximum saving of 29.9% cooling load can be achieved by shading east wall. The heat gain through east wall and fenestration is also found to be minimum by shading east wall.

6. It is seen that overall building roof and outer wall insulation can enhance the building inside environment and consequently diminishes the energy consumption but adjacent shading has the more effective results and it is more economical if land is available around the building.

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