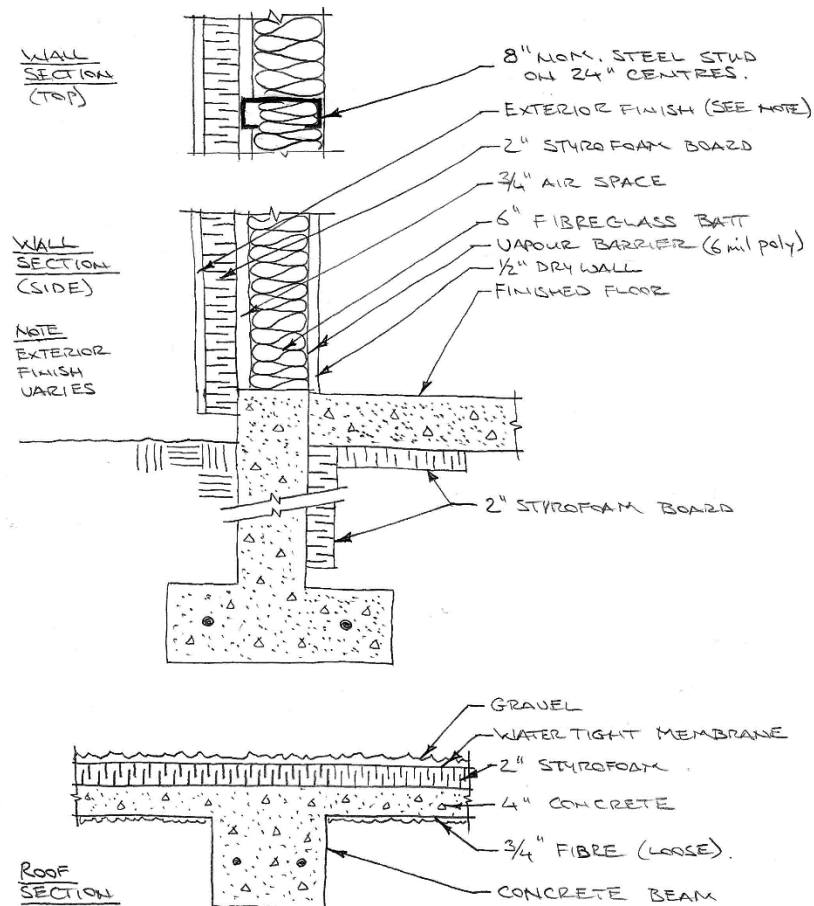


Tech Building: Machine Shop – Wall and Roof Section Views

Wall Comment

If you stand outside the building you will see that there are really two exterior wall constructions. The lower portion of the wall has stucco on it. That is the wall that is indicated in the drawings below. The upper half of the wall has corrugated siding on the outside. In this upper part of the wall the 2" Styrofoam insulation is not there. To do a complete analysis analyze the wall as it really is.



Studs in the Wall

Note that the inner Fiberglass Insulation part of the wall is built with vertical steel studs. In some ways this is like the example problem that we did in class. It had studded and non-studded parts to the wall. The exception here is that our building's walls are built with steel studs instead of wood studs.

Perform your heat transfer analysis on the wall as though the walls were built with wood studs.

Comparing wood studs with steel studs leads to the follow observations:

- Steel conducts heat well but the heat transfer path in steel studs is very narrow (the metal is very thin)
- Wood conducts heat poorly but the heat transfer path in wood studs is very wide (thickness of the stud)
- Conclusion: the two effects (conductivity and width) cancel each other out and the heat transfer behaviour of wood studs is very much like that of steel ones. This allows you to do your analysis very much like the class example and regard part of the wall as being made from wood studs.