MET 466 – Thermal Processes Lab

LAB #2
Conductive Heat Flow

Assigned: 9/19/07
Due: 9/26/07

- Steady state temperature will be achieved prior to lab.
- Type J thermocouples will be attached to data logger prior to lab.

Procedure:

1. Calculate total theoretical unit thermal resistance in the wall for case A, B and C (shown in figure 2.1). Material type is given in table 2.1 with a K value for the insulation.
2. Setup data logger and program.
3. Record all thermal couple wall temperatures in the wall for cases A, B and C (shown in figure 2.1).

Results:

1. Calculate the expected temperatures for all three cases at each building material interface.
2. Plot temperature gradient (dx/dt) for all three cases.
3. Compare and contrast the recorded temperatures to the theoretical temperatures for all three cases.

NOTE:

-ALL RESULTS SHOULD BE PERFORMED IN MATHCAD AND SOLUTIONS PROVIDED IN ENGLISH UNITS.

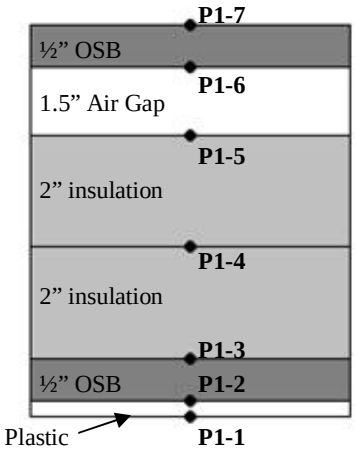
-DATA LOGGER CHANNEL DESCRIPTION IN TABLE 2.2

Table 2.1	
Material Type	K Value
Plastic (Acrylic)	Find
Insulation	.0226 W/m-k
Medium Density Particleboard (OSB)	Find
Stud (Fir)	Find

Table 2.2	
Data logger channel	Description
1	P1-1
2	P1-2
3	P1-3
4	P1-4
5	P1-5
6	P1-6
7	P1-7
8	P1-9
9	P1-10
10	P1-11
11	P1-12
12	P1-13
13	P1-14
14	P1-15
15	P2-1
16	P2-2
17	P2-3
18	P2-4
19	P2-5
20	P2-6

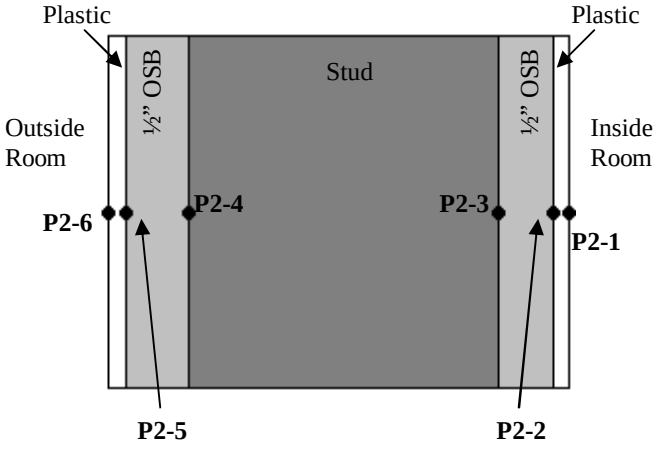
Figure 2.1

CASE: A



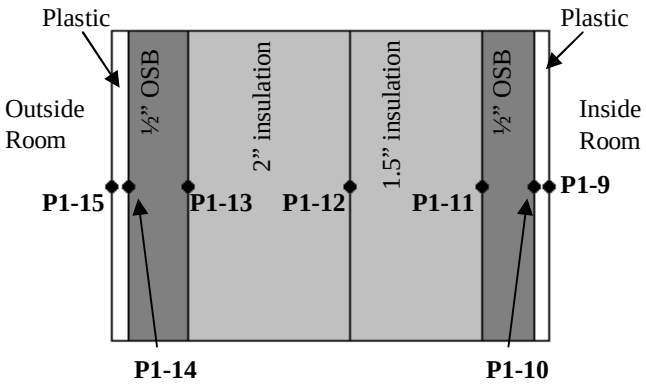
Ceiling Cross-section and TC Locations

CASE: B



Stud Cross-section and TC Locations

CASE: C



Wall Cross-section and TC Locations