



Municipality of Anchorage



Handout M.01 Heat Loss Worksheet

ASHRAE 90.1 - 1989 COMMERCIAL
ASHRAE 90.A - 1980 RESIDENTIAL

GENERAL DATA:

PROJECT NAME: _____ DATE: _____

SUBDIVISION: _____ LOT: _____ BLOCK: _____

PREPARED BY: _____

DESIGN CONDITIONS:

LOCATION: ANCHORAGE, AK LATITUDE: 61° 10' LONGITUDE: 150° 01'

90° TEMPERATURE DIFFERENCE
10,864 HEATING DEGREE DAYS

COMMERCIAL

| | <u>U(Btu/h.ft.F)</u> | <u>R(1/U)</u> |
|--|----------------------|---------------|
| 1. COMBINED GROSS WALL TRANSMITTANCE VALUE | 0.100 | 10 |
| 2. COMBINED GROSS ROOF TRANSMITTANCE VALUE | 0.041 | 24.4 |
| 3. MINIMUM INSULATION FOR WALL BELOW GRADE | 0.077 | 13 |
| 4. MINIMUM INSULATION FOR UNHEATED SLAB ON GRADE | 0.091 | 11 |
| 5. MINIMUM INSULATION FOR HEATED SLAB ON GRADE | 0.077 | 13 |
| 6. COMBINED GROSS FLOOR TRANSMITTANCE VALUE | 0.040 | 25 |

RESIDENTIAL

| | <u>U(Btu/h.ft.F)</u> | <u>R(1/U)</u> |
|---|----------------------|---------------|
| 7. COMBINED GROSS WALL TRANSMITTANCE VALUE | 0.130 | 7.7 |
| 8. COMBINED GROSS ROOF TRANSMITTANCE VALUE | 0.033 | 30.3 |
| 9. MINIMUM INSULATION FOR WALL BELOW GRADE | 0.077 | 19 |
| 10. MINIMUM INSULATION FOR UNHEATED SLAB ON GRADE | 0.122 | 8.2 |
| 11. MINIMUM INSULATION FOR HEATED SLAB ON GRADE | 0.094 | 10.7 |
| 12. COMBINED GROSS FLOOR TRANSMITTANCE VALUE | 0.080 | 12.5 |

Ron Thompson Building Official
Date: June 5, 2006
(Ref. 97-03, 00-03, 01-03; 02-09; 06-02)

| Wall Designation | Gross Area (sq. ft.) | Area (sq. ft.) | U Actual (Btu/h ft. ² F) | A x U (Btu/h F) | | Actual U x A (Btu/h F) |
|------------------|-------------------------|-------------------|--|--------------------|--|---------------------------|
|------------------|-------------------------|-------------------|--|--------------------|--|---------------------------|

North Facing Walls

| | | | | | | |
|----------------------------|--|---|----------------|---|---|--|
| Gross Wall Area (GA) | | | | | | |
| Window Area (WA) | | | x | = | | |
| Door Area (DA) | | | x | = | | |
| Net Wall Area (=GA-WA-DA) | | = | x | = | | |
| | | | Sum of U x A = | | → | |

South Facing Walls

| | | | | | | |
|----------------------------|--|---|----------------|---|---|--|
| Gross Wall Area (GA) | | | | | | |
| Window Area (WA) | | | x | = | | |
| Door Area (DA) | | | x | = | | |
| Net Wall Area (=GA-WA-DA) | | = | x | = | | |
| | | | Sum of U x A = | | → | |

East Facing Walls

| | | | | | | |
|----------------------------|--|---|----------------|---|---|--|
| Gross Wall Area (GA) | | | | | | |
| Window Area (WA) | | | x | = | | |
| Door Area (DA) | | | x | = | | |
| Net Wall Area (=GA-WA-DA) | | = | x | = | | |
| | | | Sum of U x A = | | → | |

West Facing Walls

| | | | | | | |
|----------------------------|--|---|----------------|---|---|--|
| Gross Wall Area (GA) | | | | | | |
| Window Area (WA) | | | x | = | | |
| Door Area (DA) | | | x | = | | |
| Net Wall Area (=GA-WA-DA) | | = | x | = | | |
| | | | Sum of U x A = | | → | |

Total Gross Wall Area =

U Allowable (Line 1 or 7) =

Allowable U x A = Btu/h F Sum of Actual U x A =

| Roof Designation | Gross Area (sq. ft.) | Area (sq.ft.) | U Actual (Btu/h F) | A x U (Btu/h F) | A x U Actual (Btu/h F) |
|------------------|-------------------------|------------------|-----------------------|--------------------|---------------------------|
|------------------|-------------------------|------------------|-----------------------|--------------------|---------------------------|

Roof/Ceiling

| | | | | | |
|---------------------------|--|---|-----------|---|---|
| Gross Roof Area (GA) | | | | | |
| Window Skylight Area (WA) | | | | | |
| Net Roof Area (-GA -WA) | | = | x | = | |
| | | | U x A Sum | | → |

Total Gross Roof Area =

U Allowable (Line 2 or 8) =

Allowable U x A = Btu/h F Actual U x A =

| Floor Designation (above unheated spaces) | Gross Area (sq. ft.) | Area | U Actual (Btu/h F) | A x U (Btu/h F) | A x U Actual (Btu/h F) |
|--|-------------------------|------|-----------------------|--------------------|---------------------------|
|--|-------------------------|------|-----------------------|--------------------|---------------------------|

Floor Area

| | | | | | |
|------------|--|--|--|---|---|
| Floor Area | | | | = | → |
|------------|--|--|--|---|---|

Total Floor Area =

U Allowable (Line 6 or 12) =

Allowable U x A = Btu/h F Actual U x A =

| Walls Below Grade | Gross Area (sq. ft.) | Area | U Actual (Btu/h F) | A x U (Btu/h F) | A x U Actual (Btu/h F) |
|-------------------|-------------------------|------|-----------------------|--------------------|---------------------------|
|-------------------|-------------------------|------|-----------------------|--------------------|---------------------------|

Wall Area for Below Grade Walls

| | | | | | |
|-----------------------|--|--|--|---|---|
| Below Grade Wall Area | | | | = | → |
|-----------------------|--|--|--|---|---|

Total Below Grade Wall Area =

U Allowable (Line 3 or 9) =

Allowable U x A = Btu/h F Actual U x A =

Envelope Compliance Check

| | Allowable U x A | Actual U x A |
|-------------------|-----------------|--------------|
| Walls | | |
| Roof/Ceilings | | |
| Floors | | |
| Walls Below Grade | | |
| Totals | | |

Total of "Allowable U x A" Must be greater than "Actual U x A"

Heating System Compliance

Infiltration Calculation

Building Volume (BV) = FT³
 Air Changes per house (ACH) = 1/hr

Infiltration CFM (=BV x ACH/60) CFM
 CFM of outside air provided by HRV CFM
 TOTAL CFM outside air required to be heated CFM

Heat Loss Totals

Envelope
 Total Actual U x A Delta Deg F x 90 = Btu/h

Outside Air
 Total CFM Delta Deg F x 90 = Btu/h
 1.08 x

Total BTH/h required (Sum of envelope and outside air) =

Minimum Heating Plant Size Required (= total Btu/h 1.33) = x 1.33 Btu/h