

DENNIS & MAGNANI
STRUCTURAL CONSULTANTS, P.C.

February 16, 2010

Mr. Andrew Hobbs
Hobbs Building Systems

**RE: Thermal Resistance Calculations of
Hobbs Standard Contour Panel/Stucco
Ready Exterior Walls**

Dear Andy;

At your request, Dennis & Magnani Structural Consultants, P.C. has performed calculations to determine thermal resistance (R-Value) of fully constructed 8'-4", 9'-4" and 10'-4" Hobbs Standard Contour Panel/Stucco Ready Exterior Walls.

Thermal resistance calculations were performed based on procedures in Chapters 25, 26 and 27 in the **ASHRAE Handbook – 2009 Fundamentals**. The constructed Hobbs Building Systems product is an insulated concrete form system wall. Wall thickness is 9 7/8 inch. Extruded furring assemblies made from Polyvinyl Chloride (PVC) are provided at 16 inch on center vertically. Specially cut expanded polystyrene rigid board foam is placed between the furring assemblies. The foam is held in place with Acrylonitrile Butadiene Styrene (ABS) clips that fasten to the furring assemblies. Refer to the attached Hobbs Building Systems drawings for information on how the foam is cut and fits to the furring channels. The walls are typical reinforced with deformed steel bars at the vertical furring assemblies and horizontally at the top and bottom of the wall.

You have provided information on the thermal conductivity for the expanded polystyrene rigid board foam. The foam is Type II ASTM C578 with a nominal density of 1.5 pounds per cubic feet. The corresponding R-Value is 4.76 hrft²°F/Btu·in at a 25 °F temperature. Concrete is assumed to have a thermal conductivity of 0.08 hrft²°F/Btu·in. A weighted R-Value was calculated for the differing Hobbs Building Systems wall heights. Refer to the attached calculations for the weighted R-Values. The "parallel-path method" outlined in Chapter 27 of the **ASHRAE Handbook** was used to determine the weighted R-Values of the Hobbs Building Systems walls.

The inside surface of the wall is assumed to be finished with an interior air film with an R-Value of 0.68 hrft²°F/Btu and 1/2 inch gypsum wall board with a R-Value of 0.45 hrft²°F/Btu. The outside wall is assumed to be finished with 3/4 inch stucco composed of Portland cement, lime, sand and water over lath with an R-Value of 0.20 hrft²°F/Btu·in. The PVC furring assemblies essentially penetrates the full depth of the wall. These represent a small cross sectional area of the wall and are judged to have a negligible effect on the overall R-Value of the wall.

Table 1 presents the calculations of the R-Values of the 8'-4", 9'-4" and 10'-4" walls

COMPONENT	WALL HEIGHT		
	8'-4"	9'-4"	10'-4"
Gypsum Wallboard, 1/2 Inch	0.45	.045	.045
Interior Air Film	0.68	.068	.068
Hobbs ICF Standard Contour Panel/Stucco Ready Exterior Wall	31.66	31.91	32.09
Stucco, 3/4 Inch	0.15	0.15	0.15
TOTAL R-VALUE	32.94	33.19	33.37

The total thermal resistance (R-Value) of the walls are 32.94, 33.19 and 33.37 hrft²°F/Btu for the 8'-4", 9'-4" and 10'-4" Hobbs wall assemblies respectively. The thermal transmittance (U-Factor) is the inverse of the total R-Values and is equal to 0.030 Btu/ hrft²°F for all three assemblies.

This report is provided to illustrate an example of thermal properties of Hobbs Building Systems Standard Contour Panel/Stucco Ready Exterior walls. Different Hobbs Building Systems wall systems and/or different wall finishes will result in different total R-values. A warranty or certification of total R-values indicated or inferred can not be provided by the author and are beyond the scope of this report.

Please call if you have questions or if you require additional information.

Sincerely,


Randy J. Magnani, P.E.
President

RJM/lis

Enc.

