

Structural Breadth

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Upon investigation of the structural system of my building, the use of metal studs for the structure will be compared as an economic and environmentally friendlier alternative to wood studs. The basis of this analysis will be based on the fact that harvesting of trees reduces the amount of carbon dioxide which can be absorbed from the atmosphere. This sequestration of carbon dioxide by forests helps remove the amount of green house gas in the atmosphere. By using cold rolled metal studs which are at least 25% recycled on average will result reduced deforestation. Moreover, when metal framed structures are demolished, the structural framing can be recycled where as a wood structure will be disposed of in landfills.

The transportation of these two materials also has an effect on emissions. Depending on location, lumber products may have to be shipped from a much further distance than metal studs. In this instance for the location of my site, metal studs are shipped from producers in Pittsburg. Wood studs on the other hand come from as far away as parts of Canada. The following table shows average emissions for heavy trucks on a freeway.

		Local Road Emission Factors (grams/mile)				
	Year	VOC	CO	NOx	PM-10	PM-10 (Exhaust only)
Single-Unit Gasoline Truck	2002	7.06	144.07	5.94	0.13	0.11
	2010	1.87	34.32	4.09	0.09	0.07
	2020	0.63	21.71	1.58	0.05	0.03
Single-Unit Diesel Truck	2002	1.18	6.86	14.95	0.42	0.38
	2010	0.74	3.39	7.27	0.17	0.13
	2020	0.52	0.71	1.27	0.07	0.03
Combination Diesel Truck	2002	1.22	7.64	16.07	0.41	0.37
	2010	0.78	3.52	7.45	0.17	0.13
	2020	0.56	0.78	1.29	0.07	0.03

Table 5: Truck Emissions

Moreover, since metal studs are lighter per unit than wood studs, the amount of metal studs which can be transported at one time is much higher thus reducing the amount of pollutants put into the air by the

transporter. The fact that the metal studs are also in the shape of a C means that more can be stacked together to conserve space.

Metal studs have the same structural capacity as their wood counterparts. This works towards an advantage of also bringing the weight of the structure down due to the fact that they are hollow. However, metal studs have some disadvantages such as buckling under high temperatures, oxidation and thermal short circuiting when not installed properly. Lastly, metal studs are competitive in cost with wood studs so they are not a financial issue. Therefore, metal studs would be a good alternative to wood framing as it can reduce green house gas emissions from its transportation and will reduce deforestation from the harvesting of lumber.