

Associate Professor

Construction Engineering and Management, University of Alberta
3-015 Markin/CNRL Natural Resources Engineering Facility
Edmonton, Alberta T6G 2W2
Tel: 780.492.0599 Fax: 780.492.0249
E-mail: malhussein@ualberta.ca Prefabricated Construction
Website: <http://www.uofaweb.ualberta.ca/construction/alhussein.cfm>

Dr. Mohamed Al-Hussein's research on prefabricated construction was covered in the New Trail (Fall 2009) magazine.

House Work – Prefabricated Building Industry

U of A civil and environmental engineering professor Mohamed Al-Hussein wants to put the “pre” back in “prefabricated” as a way of greening the housing construction industry. Although the prefabricated building industry — which prefers to refer to its products as being built “off-site” — has been operating for decades, Al-Hussein thinks it's time that more builders did away with all that wasteful, arbitrary and inefficient on-site framing, wiring, plumbing, drywalling and painting that generates a haze of greenhouse gases.

“All that material, all those trucks and people coming and going every day,” says Al-Hussein. “Estimates are that building a home between 1,200 and 1,600 square feet generates about 55 to 100 tonnes of CO₂, while also heating a home while it is being built (to keep temperatures optimum, not just for the workers, but for things like drywall compound and paint) can generate another five tonnes of CO₂ a month. We think we can cut that in half.”

Al-Hussein and his team have been working for the last couple of years on computer-assisted design and other artificial intelligence software they've been developing to streamline the house-building process. The “parts” for the house are made in an off-site factory and then assembled on the foundation that's been poured for the house. The goal is to cut the construction time by more than 60 percent while reducing home construction costs by 20 percent.

“We've got it to about 30 homes a month and capacity to go to 40 or 45, though demand for new homes has slowed a bit recently here,” says Al-Hussein.

On-site vs. Modular re: the North Ridge Place Seniors' Residence, St. Albert

Dr. Al-Hussein analyzed the CO₂ impact of modular verses conventional construction on-site construction of the North Ridge Place Seniors' Residence, St. Albert. His conclusion stated “In summary, modular construction compared to on-site construction results in a scheduling savings of 55% and a 43% reduction in CO₂ emissions. Conventional construction results in 14.3 months and 98.9 tonnes of CO₂ emissions while modular construction takes only 6.03 months and results in 56.3 tonnes of CO₂.”

More research is being undertaking by the: *Natural Sciences and Engineering Research Council (NSERC) Industrial Research Chair and the Alberta Construction Industry:*

<http://irc.construction.ualberta.ca/html/overview.html>