

COMMUNITY CHAMPION

ROKFORM SOLUTIONS' LOW CARBON CONCRETE POLICY

FEBRUARY 29, 2024



City of
NELSON

ROKFORM
»»» **solutions**

Concrete Seminar

In 2023 Rokform Solutions, a local concrete contractor, collaborated with the City of Nelson, Lafarge Canada, and Nelson Ready Mix to host a seminar on low-carbon concrete. The seminar provided education for the local building industry on strategies to reduce the carbon pollution associated with concrete use including:

- Utilizing a low carbon concrete mix (containing fly ash – a cement substitute)
- Not bumping up concrete mix strengths and assembly thicknesses beyond code specifications
- Other innovative strategies (using concrete as a finished floor surface to avoid using more materials)

Most of these strategies actually **result in cost-savings for contractors** as they reduce the total volume of concrete/cement required, and fly ash is generally cheaper to source than cement.

An immediate positive response was noticed from contractors who began to utilize these strategies!

To read more on these strategies and the impacts they can have please read the

[*2 Building Better in the Kootenays Case Study - Addressing Embodied Carbon in Concrete.](#)



Dan Thompson, of Rokform Solutions has demonstrated an outstanding level of commitment to sustainability and environmental stewardship in the local concrete industry.

Dan is a dedicated member of Nelson's Embodied Carbon Advisory Group. This group was established through the Low Carbon Homes Pilot in 2020 with funding from FortisBC, and meets monthly to discuss topics related to the reduction of embodied carbon emissions in the local building industry.

So why is concrete such a big deal?

- Concrete accounts for about 35% of embodied carbon emissions in new Kootenay homes (see the [^{*1} Low Carbon Homes Pilot Benchmarking Report - 2020](#))
- Globally, cement contributes approximately 8% of total annual carbon emissions - approximately triple that of the aviation industry.
- If the cement industry were a country, it would be the third largest emitter of carbon emissions.

Embodied emissions come from the extraction, manufacturing, transportation, installation, maintenance, and disposal of products and materials.

Embodied emissions account for about 50% of a building's lifetime emissions, but are largely not considered or accounted for in building industry or policy.



CASE STUDY

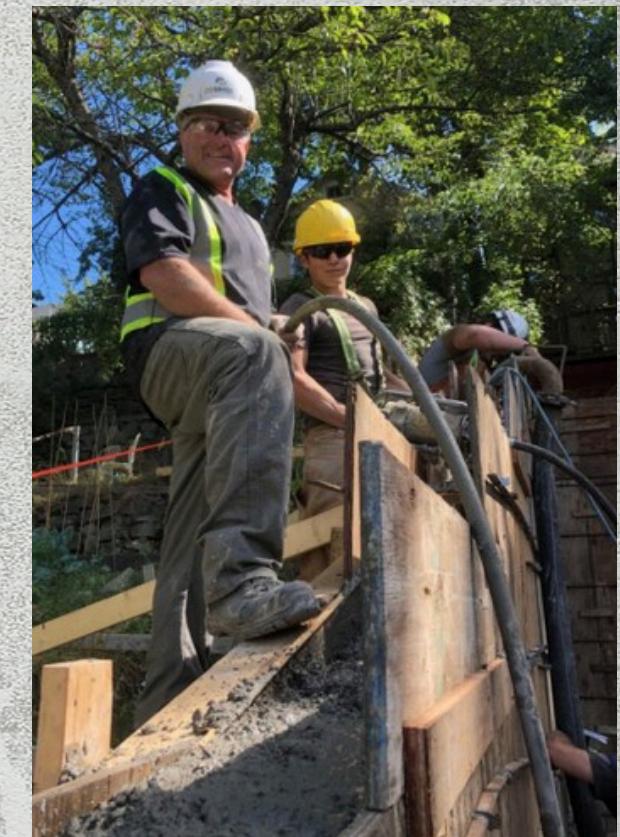
Shortly after the seminar, Dan Thompson drafted an internal Low-Carbon Policy for Rokform Solutions. The policy, implemented in July of 2023, has already resulted in a significant reduction of pollution, with Rokform estimating a total of 60 tons of CO2 reduced in the second half of 2023.

That's like taking 16 cars off of the road for a year!

- 29 of these tons were attributed to reduced use of concrete during concrete design and pouring processes
- 31 tons were attributed to the use of the high fly ash concrete mix

Rokform's Low Carbon Concrete Policy Guidelines

- Use a lower carbon concrete mix - Nelson Ready Mix's high fly ash concrete mix offers an emissions reduction of 64 kg CO2/m3 (conventional blend, 350 kg CO2/m3 – NRM blend, 286 kg CO2/m3). NRM's low carbon blend flows better than conventional mixes which can make for a smoother finish. It also takes longer to cure which can be helpful in hotter temperatures, but provides some limitations in colder weather.
- Reduce total use of concrete (reduce slab thickness from 5" to 4" or 3" where permitted, reduce ICF thickness from 8" to 6", reducing floor toppers from 2" to 1.5"). Use more gravel and less concrete during Slab preparation – it is common practice in industry currently to go beyond specified thicknesses (which already incorporate a more than sufficient safety margin) due to cautionary measures and assumed ease of pour preparation.
- Reduce concrete compressive strengths (measured in MegaPascals – MPa) by lowering the volume of cement added. It is common practice in the industry to use higher MPa's than are specified, but substantial safety margins are already accounted for in these specifications. Industry average emissions intensity for concrete with an MPa of 25 or lower is 305 kg CO2/m3. The industry average for concrete with an MPa of 26-30 is 350 kg CO2/m3 - almost 15% more!



Call To Action

In 2023, Nelson Ready Mix supplied the area with over 15,000m³ of concrete
>6,300m³ for commercial use
>8,700m³ for residential use

If 75% of residential use and 20% of commercial use replaced conventional mix with the low carbon concrete mix **This would result in the reduction of about 500 tons CO2 in a year!**

(These were percentages estimated by Rokform Solutions to be realistically achievable due to curing time considerations)

Key Contacts

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Sustainability Award

December 14, 2023, Dan Thompson received a Sustainable Leadership Award from the City of Nelson for his dedicated work.

Congratulations to Dan and Rokform Solutions for your outstanding contributions to the City's work on climate action!



Want to Get Involved?

Visit nelson.ca/programs to learn about the City of Nelson's Climate Plan (Nelson Next), and related programs

For information on the Low Carbon Building Materials Program and links to the Low Carbon Homes Pilot publications, please visit:
<https://www.nelson.ca/905/Low-Carbon-Building-Materials>

Linked References:

*1 [Low Carbon Homes Pilot Benchmarking Report](https://www.nelson.ca/DocumentCenter/View/5586/Benchmarking-Report?bidi=1) - 2020

<https://www.nelson.ca/DocumentCenter/View/5586/Benchmarking-Report?bidi=1>

*2 Building Better in the Kootenays Case Study - [Addressing Embodied Carbon in Concrete.](https://www.nelson.ca/DocumentCenter/View/6832/LCHP-Concrete-Brief---March-2023?bidi=1)

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