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Hello Doug-

I am writing to you today in regards to the CEQA Thresholds of Significance for GHG Emissions, specifically those associated with material manufacture, delivery and installation. We had a chance to meet and briefly discuss the issue following the October 27th Public Workshop. Unfortunately I was not able to attend the December 9th workshop.

My colleagues at Davis Langdon and I have reviewed the presentation pdf , and would like to address the proposed performance standard for construction phase GHG emissions. It is our opinion that these standards present an opportunity to generate immediate reductions in CA's GHG emissions as they represent large short-term gains, as opposed to the long-term gains that are afforded by operational savings of energy and water.

The current proposed measures are:

- a) Provide alternative transportation for workers to and from a jobsite on days that require more than 200 workers.
- b) Recycle or salvage at least 75% of construction and demolition debris.
- c) Use recycled materials for at least 20% of construction materials.

We are very happy to see that there has been development of the performance standards in this area, however, we believe it may be possible to improve these standards, making the goal of 30% better than business as usual more achievable. We have the following concerns with the proposed requirements:

- a) The requirement for alternative transportation is likely to impact only a portion of construction projects in the state, and for only those days on which they have very high numbers of workers. By limiting this requirement to only those high population days, the supply of alternative transit is likely to be erratic, and unlikely to be relied on by workers.
- b) There should be a distinction between the required diversion percentages for recycling and salvaging of construction and demolition waste as there is a significant difference in the GHG emissions associated with each. Recycling is typically more energy intensive than reuse.
- c) The simple use of total project recycled materials does not guarantee a reduction in the GHG emissions associated with a project. There are several reasons for this:
 - a. A product with a high recycled content will have lower associated GHG emissions than a comparable product (i.e. 95% recycled steel has lower GHG emissions than 30% recycled steel) however there are other materials that may release fewer emissions than recycled materials. For example, a project incorporating straw bale construction could include very little if any recycled content, yet would have significantly lower associated GHG emissions than concrete, steel or glass.
 - b. The 20% recycled content threshold does not usually represent an improvement on business as usual, as most commercial new buildings with either a steel or concrete structural system are likely

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to exceed 20% recycled content. Of seven sample LEED NCv2.2 certified projects reporting their credit totals, four exceeded the 20% threshold without additional effort on the part of the projects.

Based on our experience in sustainability consulting, cost management, project management, and research within the state of California and abroad, we would propose the following revisions to the proposed construction phase performance standards. By dividing the performance standards according to their emissions contribution, it becomes easier to devise mitigation strategies which will directly contribute to reducing California's GHG emissions. The following mitigation strategies could then be selectively adopted by projects depending on their particular circumstances, with the every project required to adopt at least 1 mitigation strategy in each major category (On-site, Off-site Vehicular, Off-site Industrial, Off-site Waste Handling.)

Category		Potential GHG Emissions	Mitigation Strategy
On-site	Equipment, Vehicles, Machinery for demolition/deconstruction	Low- Medium	1) Comply with existing ARB requirements and 2) Specify deconstruction with reduced equipment use.
	Equipment, Vehicles, Machinery for Construction.	Low- Medium	1) Comply with existing ARB requirements for low-sulfur diesel and reduced idling.
Off-site Vehicular	Equipment/Machinery for harvest/extraction of source materials, transport of materials from point-of-harvest to point-of-manufacture & transport of materials from point-of-manufacture to construction site.	Medium-High	1a) Specify that 20% of project materials are to be harvested and manufactured in CA, and therefore subject to state fuel and emissions restrictions. % of local content can be measured by either cost, weight, or volume provided the metric is used consistently on the CEQA submittal. or 1b) Specify that 20% of project materials arrive with a transportation emission/lb of materials that is less than or equal to 500 miles of truck transport. The Canada Green Building Council LEED rating system has an existing calculator that could serve as a reference. and 2) For multiple building sites within close range, use a central logistics center for all deliveries to reduce traffic and minimize site congestion.
	Transport of workers to and from home to construction site.	High	1) Provide incentives for alternative transit for all construction site workers. This could include offering transit-check rewards, facilitating bike storage, facilitating a ride-share matching program, providing maps for nearby public transit, etc...
Off-site industrial	Manufacture of finish building materials from source materials (Energy, Water, Waste)	Medium- High	1a) Specify all steel products to have an average recycled content of 70% or greater, and all concrete aggregate and water to be sourced within 500 miles of a project with a minimum of a 5% recycled content in all cement. or 1b) Specify 10% of materials to be rapidly renewable. or 1c) Specify 10% of materials to be sourced from salvage/reuse. or 1d) Reuse 75% of existing building shell, structure, or foundation.

			or 1e) Set a carbon equivalent intensity threshold of 70lbs of CO ₂ e/sf for project materials. (As Based on the EPA Design for Deconstruction report, p.31)
Off-site Waste Handling	Land-filling of waste materials, recycling of waste materials, re-use of waste materials.	Low-Medium	1a) Avoid all land-filling of waste materials and 2a) Divert at least 75% of C&D waste towards recycling streams. or 1b) Divert at least 50% of C&D waste to building material salvage and reuse. and 2b) Design the building for easy deconstruction.

Projects would be required either to meet some combination of the above mitigation measures, or to quantify the GHG emissions associated with the manufacture and installation of building materials of their project. It is our understanding that the Resources Agency will be establishing calculation methodologies and equivalence targets for projects that do not meet the performance thresholds.

Davis Langdon has recently completed studies on buildings quantifying the GHG emissions associated with materials. We found that the materials of the buildings studied contributed to 11-15% of the projected GHG emissions over a 50 year term. However, if only the period up until 2020 was considered, materials contributed up to a third of the buildings GHG emissions. There is an enormous opportunity here to reduce emissions today by regulating materials as well as operational energy/water consumption and transportation. A presentation version of our study has been attached for your review.

To date, no single methodology for quantifying the GHG emissions associated with building materials has been developed and universally accepted. However, there appears to be a growing consensus for setting goals that can be measured in terms of carbon emissions per square foot (or meter) of building. The adoption by California of a measurement for GHG associated with material production and installation should be developed and would allow the CEQA process to accurately reflect a project's GHG impact.

Please let us know if you would like to discuss any of these options in further detail. I am happy to help locate any referenced standards or calculation methods that may prove useful in your development of the performance standards. I have also attached an article from Building Magazine in the UK that our London office put together, and which provides a useful summary of the issues surrounding the embodied carbon of materials.

Please keep in touch, and I hope to see you at the next workshop.

Best,

Anne Nicklin
Sustainability Planner