Title: Sustainable Concrete

Author:
Iyad M. (Ed) Alsamsam, PhD, SE, PE
General Manager
Portland Cement Association
5420 Old Orchard Road
Skokie, Illinois 60077-1083
847.966.6200
alsamsam@cement.org
Member, Structural Engineering Institute Sustainability Committee

Lionel Lemay, P.E., S.E.
Senior Vice President, Technical Resources
National Ready Mix Concrete Association
1244 Crane Boulevard
Libertyville, IL 60048
847.918.7101
llemay@nrmca.org

Abstract:
Given the broad use of concrete in all types of construction, it is important to understand the sustainability considerations of the material. This paper will discuss the numerous sustainable strategies that can be employed with concrete, such as the following:

- Manufacturing: The environmental impacts of concrete can be reduced by substituting waste byproducts such as fly ash and slag as cementitious materials.
- Construction: The many materials and accessories, from admixtures to formwork, all have impacts. Substituting lower-impact materials can help to make the whole process more sustainable.
- Use: By working closely with the architect and mechanical engineer, the thermal massing effect achieved with concrete can be used to reduce the thermal loads on a building. Concrete durability and maintenance will be discussed as well at the potential of concrete in reducing the urban heat-island effect.
- End-of-life: Recycled crushed concrete is a good product for sub-base drainage aggregate and its re-use as aggregate in lower-strength concrete applications is under evaluation. Another possibility is the reuse of precast concrete members where they're carefully detailed and then deconstructed.

This paper will help to clarify how engineers can properly employ the use of concrete, improving the sustainability of the buildings they design.