

FLY ASH CONCRETE

A Factsheet from Austin Energy's Green Building Program

Fly ash is a by-product created by burning coal. It can be used as a supplement to, and a partial replacement of, portland cement in concrete. On average, 30 percent of the fly ash produced in the United States is recycled into concrete mixes. The use of fly ash concrete in structural applications such as wall-forms is standard technology.

Why Put Fly Ash in Concrete?

- Fly ash creates stronger concrete, but strength may develop more slowly than all portland cement concrete. When the amount of portland cement replacement by fly ash is relatively low (15%-30%), the difference in strength development time is negligible.
- Easier to place, pump, work and finish.
- Can be mixed in proportions which make summer concrete finishing easier.
- Can be mixed in proportions which don't affect winter finishing.
- Concrete will require less water, resulting in less shrinkage and cracking.
- Readily available in concrete from most concrete suppliers in Central Texas.
- Saves virgin materials, energy, landfill costs, and reduces pollution.

How Does Fly Ash Affect Concrete Finishing?

Fly ash may increase concrete set-up time. This is desirable in hot weather, but not in cold. However, since fly ash content has so many advantages, it should be used in all seasons. Proportions can be adjusted to enable easy finishing in any weather.

Is it Okay to Use Fly Ash if the Finish Floor is Concrete?

Almost always--all the above advantages apply. Note especially that less water is required, resulting in less shrinkage and cracking. All proper construction techniques to minimize cracking should be employed (correct mix for weather conditions, proper curing, etc.), but this holds true for any concrete work, whether or not fly ash is included.

Some dyes have labels stating they should not be used with fly ash concrete. This is typically because trueness to color samples has not been tested with fly ash content. However, color trueness varies with or without fly ash, due to variations in all other components. Colors should always be tested before job application.

Only when a burnished, variegated acid finish is desired would it be better not to use fly ash. This is for aesthetic reasons only.

Proportion Examples

Typical Austin area concrete with seasonally-adjusted proportions of portland cement and fly ash.

	Hot Weather	Moderate Weather	Cold Weather
Cement	300 lbs.	325 lbs.	400 lbs.
Fly ash	150 lbs.	125 lbs.	100 lbs.

Your concrete supplier can advise you about the best mix for your job.

MATERIALS

All central Texas ready-mix suppliers offer fly ash concrete. Most suppliers provide it automatically, others give a choice. A survey of Austin ready-mix suppliers found that all suppliers surveyed substituted 18 to 24 percent fly ash for cement automatically. A number of buyers request 30 percent or more substitution.

Resources

Construction Materials Research Group
Ramon L. Carrasquillo, Ph.D., P.E.
J.J. Pickle Research Center
10100 Burnett Rd., Bldg. 18B
Mail Code 78100
Austin, TX 78758
(512) 471-4585

Boral Material Technologies
Gary Shelton
45 N.E. Loop 410, Ste. 445
San Antonio, TX 78218
(800) 531-5841
www.boralmti.com/default.htm
fly ash marketing company, wholesale

Cement and Concrete Promotion Council of Texas
6633 Highway 290 E., Suite 204
Austin, TX 78723
(512) 451-5127, www.cccpc-texas.org

JTM
Bill Getirman
(713) 240-4082
fly ash marketing company, wholesale

Portland Cement Association
5420 Old Orchard Rd.
Skokie, IL 60077-1083
(847) 966-6200, www.portcement.org

State Dept. of Highways & Public Transportation
"Department Materials Specification:
D-9-8900 Fly Ash"
Joe Raska (512) 465-7469

This list does not constitute an endorsement or recommendation by the City of Austin, Austin Energy or the Green Building Program. Please check references thoroughly before employing the services of any contractor.