Rebates cut LED signal costs

Next time you want to "stop traffic," consider installing LED traffic lights. LED traffic signals last five times as long and use 85%-90% less energy than an incandescent lamp. Because they're on so frequently, that can translate into huge savings for a municipality. Now Wisconsin's Focus on Energy program, an innovative public/private partnership that strives to increase energy efficiency while saving businesses money, is offering rebates to municipalities as incentives to install the new lamps.

"Typically the first cost of LED traffic signals has been fairly high, with the energy savings resulting in paybacks of 3½ to 4 years. The incentives offered by Focus on Energy help buy that down to about half the price you see on the state bid contract," says Fred Dreher, manager of government buildings and operations for Focus on Energy. Installing the lamps is fairly straightforward, he adds.

The LED traffic signal incentive is one component of an overall incentive program aimed at local governments. The current program offers grants to help reduce the cost of installing energy efficiency measures and is in place until June 30, 2002. While the incentive program will continue after then, grant levels and program levels may change. The current program encourages energy efficiency improvements in a systematic way, rather than offering rebates for discrete measures. Lighting, heating and cooling systems should be considered for retrofit.

Focus on Energy also offers local governments such services as free technical assistance, identification surveys for ways to save energy, detailed analyses of specific energy saving measures, and financial grants. Typical ways to save energy around streets and highway operations include lighting, cooling equipment retrofits, air handler modifications, and heating retrofits.

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Concrete cylinders are roadway "insurance"

"Fortunately, concrete cylinder tests don't fail all that often," says Charles Gresser, P.E., of Giles Engineering Associates in Waukesha. "But if they're not as specified, you have to investigate." Gresser, a construction materials testing expert, taught in the recent T.I.C. workshops on *Basics of Good Concrete.*

Concrete cylinders are cast from the concrete as it's being placed, then cured and tested. Some are laboratory-cured under controlled temperature and moisture conditions, then tested in compression after 28 days to determine their strength. Others may be field-cured alongside the paving job. They help contractors decide when to remove forms and when to open the road to traffic.

Several things can result in cylinder failure. Sometimes, it is a wrong mix or bad batch from the concrete supplier. Another common reason for failure is adding too much water at the job site. Also, if the cylinder is not cast, stored or handled properly, the sample will be weaker than specified. Occasionally, a cylinder just fails because concrete doesn't always break as it should. Up to one set per hundred may fail under American Concrete Institute standards.

"Most specs say to make five sets of at least two cylinders for each class or type of concrete on the job," says Gresser. The lab then averages the two 28-day results from each set. The running average of any three sets must equal or exceed the design strength, with no individual set being more than 500psi below the design strength.

To be sure you're getting accurate results from your sample cylinders, use certified testing personnel and follow the ASTM (or AASHTO for DOT projects) standards (summarized here). Supervisors should be aware of the types of casting mistakes and field condition changes that produce bad cylinders.

The biggest casting problem is insufficient consolidation. The cylinder can lose up to 61% of its strength if not properly consolidated. A rough end before capping can steal up to a quarter of the cylinder's strength. Using a cardboard mold can reduce strength by 21% and a cylinder not cast on a level surface can cost up to 12% of the specified strength.

Freezing during the first 24 hours after casting can reduce strength by as much as 56%. Other environmental conditions that damage cylinders are: Seven days in the field at warm temperatures, up to 26%; or seven days in the field at 73 degrees with no added moisture, up to 18%.

Handle cylinders with care. Letting them rattle around in a box in the back of a car or pickup truck can damage them considerably.

When a cylinder fails, then lab engineers will have to do some

How to cast a concrete cylinder

Cylinders can be cast both for **laboratory curing** to test strength and quality, and for **field or job curing** to determine when to remove forms or when to put the structure into service. Make at least two cylinders for each purpose. Begin by gathering tools and cylinders. Samples should be taken at least every day for each class of concrete, or for every 150 cubic yards delivered. You must also test slump, air content, density, and temperature at the same time. The tests should be done carefully and precisely by a certified testing technician.

Cylinder types: metal, plastic and paper.