



Portland- Limestone Cement

Leaning on a solid foundation to build a sustainable future

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For more than a century, the Monarch Cement Company has utilized advances in technology for smarter, more efficient processes that are also good for the planet. And now, Monarch is proud to offer Portland-Limestone Cement (PLC)—engineered to reduce carbon emissions by about 10% but with all the performance and resilience you've come to expect.

Used successfully around the world since the 1960s, PLC is a direct replacement for ordinary portland cement (OPC) and can already be found in codes and standards across the U.S.

Plus, the manufacturing, application and durability are the same (if not superior) to OPC, and PLC is produced by the same cement manufacturers, used by the same ready-mix producers, and placed using the same equipment.

Working with PLC mixes

Your process doesn't change! With no difference in workability, placement or finishing characteristics, PLC mixes often result in less bleed water and shorter setting times.

Workability	Increase or decrease No significant effect on admixtures
Bleeding	Decreases with increasing fineness Generally of no concern
Setting time (initial, final)	Chance of decrease with increasing fineness Not a concern even up to 15% limestone
Heat of Hydration	Slight increase at early ages (up to 48 hours) Less significant at later ages
Compressive Strength	Can increase slightly Both early-age and long-term strengths
Scaling and Freeze - Thaw Resistance	Use same techniques as OPC concrete mixes: Proper air-void systems, curing, higher strengths
Sulfate Resistance	Use same techniques as OPC concrete mixes: Low w/cm, and MS or HS designations



PLC Use Cases

US HWY 287

 Near Lamar, Colorado



- Seven miles paving and shoulder widening
- Carries heavy trucking and commerce from US- and Mexico-based traffic
- Required summertime construction (hot, dry conditions of 100°F)
- PLC (10%L), 20% Class F fly ash
- 695 psi average 28-day flexural strength
- Contractor received quality incentive from CDOT

Several states, including Colorado, Utah, and Oklahoma, adopted PLC concrete pavements more than a decade ago, and have seen excellent durability and improved sustainability since that time. The large-scale success of these states shows the validity of the manufacturing process, easy implementation and sustainability and resilience of PLC. To learn more about PLC or to view additional details of these use cases, **visit [greencement.com](https://www.greencement.com)**.

Monarch Cement has produced cement with pride since 1908 and is proud to serve the Midwest for all its cement needs.

PLC is the next generation of traditional portland cement. If you're interested in finding a more sustainable cement, reduce energy usage and CO2 emissions, contact us to learn more today.

How much CO2 can you save by using PLC? See for yourself with the PCA's PLC CO2 calculator:

[greencement.com/advanced-co2-calculator](https://www.greencement.com/advanced-co2-calculator)

Soil Stabilization

 Florida



- Sarasota National residential development
- Cement-stabilized soil for road base
- Lengthens life of pavement
- 4% PLC dosage by weight of soil
- Data on mix designs demonstrated performance
- Switch to PLC saved an estimated 76 tons of CO2 on this project



A *greener* future

Since 1908, Monarch has been a leader in the markets we serve and committed to operations that ensure environmental sustainability. We're proud to support the Portland Cement Association's Roadmap to Carbon Neutrality by 2050. From the cement plant to the buildings and roads that serve as the foundation of our lives, each step in the process has its own part to play in the goal, just as each company and industry has a role to play in addressing climate change. Considering the recent reports from the Intergovernmental Panel on Climate Change, the time for decisive action to combat climate change is now.



The Monarch Cement Company

449 1200 Street
Humboldt, KS 66748
monarchcement.com
(620) 473-2222