

LIGNITE IN CONCRETE

SURFACE APPEARANCE, CLEANING, REPAIR, AND MAINTENANCE



LIGNITE OVERVIEW

- ▶ **Summary:** Lignite is a soft, brown-to-black natural mineral that can be present in some sand and gravel deposits. It is not intentionally added to concrete. When particles are near the finished surface, they may appear later as dark specks, stains, soft spots, small pits, or popouts. In most cases, this is an appearance concern, not a structural failure.
- ▶ **What it may look like?**
 - Small black or brown specks at the surface
 - Small holes or popouts where a soft particle came loose.
 - Light brown or dark staining around a spot
 - Random isolated blemishes rather than broad surface loss
 - Darker spots that hold moisture differently than nearby concrete
- ▶ **Why does it happen?**

Lignite is lighter, softer, and more absorbent than normal sand or stone. If it is close to the surface, it can absorb water, soften, stain the paste around it, or come loose over time. Rain, snow, freeze-thaw cycles, de-icing salts, washing, and normal use can make the particles more noticeable.
- ▶ **Is it a structural problem?**

Most isolated lignite spots are surface blemishes that do not affect overall structural integrity. They should be looked at more closely if there are many popouts over a large area, broad mortar loss, scaling, delamination, safety concerns, drainage concerns, or if the concrete is decorative or highly appearance sensitive.

CARE AND MAINTENANCE

- Wash with mild detergent and water as needed; avoid harsh acids unless tested first.
- Avoid aggressive pressure washing.
- Keep joints clean and sealed where practical.
- Maintain drainage so water does not pond.
- Use sand for winter traction when possible; avoid calcium chloride and magnesium chloride deicers.
- Use sodium chloride only in moderation and limit deicer exposure during the first winter.
- Reapply penetrating sealer as recommended by the manufacturer.

Note: This information in this tech note is general guidance. Site-specific conditions should be evaluated by qualified personnel when distress is widespread or performance is in question.

CLEANING & REMOVAL

- ▶ Lignite cannot be completely cleaned out if it is embedded below the surface. The goal is to remove loose particles, clean staining, patch small holes when needed, and protect the concrete from future problems.
 1. Let the concrete dry before evaluating or cleaning.
 2. Sweep loose dirt and debris from the surface.
 3. Scrub with a stiff-bristled broom to loosen dirt and help dislodge soft surface particles.
 4. Use a wire brush carefully for stubborn particles. Do not scrub so hard that sound concrete paste is damaged.
 5. Rinse with clean water or use light pressure washing. Avoid high pressure that can enlarge holes or erode paste.
 6. Remove loose exposed particles with a scraper, pick, wire brush, or small hand tool; then rinse or vacuum the void clean.
 7. Let the area dry before patching or sealing.
- ▶ **Appearance Notes:** Cleaning, brushing, pressure washing, patching, or sealing can create color or texture variations. Cleaned areas may look lighter, darker, smoother, rougher, or different from surrounding concrete. Always test a small area first and use the least aggressive method that works.
- ▶ **Patching and sealing:**

Small holes may be filled with a compatible exterior cementitious repair material if appearance requires it. Patches may not match perfectly. Once clean and dry, a breathable penetrating sealer, such as silane or siloxane, may help reduce water and deicer penetration. Follow the product manufacturer's instructions.

For more information and full list of industry reference materials, please visit our website at

www.miconcrete.org

INDUSTRY REFERENCES

- ▶ ACI and ASTM address coal, lightweight particles, and other deleterious materials in aggregate.
- ▶ NRMCA CIP 40 discusses aggregate popouts caused by near-surface particles.
- ▶ MCA guidance on surface distress also notes that objectionable appearance does not always mean the concrete has lost structural integrity.

Additional references

ACI E1 Aggregates for Concrete; ACI 221R; ASTM C33/C33M; ASTM C123/C123M; NRMCA CIP 40 Aggregate Popouts; FHWA materials-related distress guidance; MCA Preventing Scaling of Concrete with Portland Limestone Cement, July 1, 2024.