PCI Plant Quality Talk
Quality Enhancement Committee

SERIES 3, ISSUE 12 – REINFORCEMENT SHADOW LINES

Reinforcement shadow lines typically look like faint shadowy lines on the surface of the concrete directly adjacent to the reinforcing steel. The shadowing may reflect the presence of steel reinforcement bars (rebar), strand, mesh, or other embedded items within the component. The severity or contrast of the shadow largely depends on the concrete mixture design, the amount of concrete cover of reinforcement, vibration of reinforcement, placing methods, and other factors.

Similar to pour lines, reinforcement shadow lines can be considered a noncritical blemish, rather than a significant structural defect. However, the accepting authority—the contractor, architect, owner, or jobsite inspector—may deem this defect to be an unacceptable finish defect.

To avoid reinforcement shadow lines:

- Take care to ensure an adequate amount of concrete cover of reinforcement (clear distance) is available for the coarse aggregate to flow around the reinforcement and panel face.
- Ensure as-specified reinforcement spacing, and take care to not disturb the cover during concrete placement. Limit concrete fall to 2 to 3 ft or less by means of a proper drop chute or device.
- For conventional concrete, ensure that vibration equipment (i.e., internal vibrators) is not in direct contact with reinforcement. Direct contact with reinforcement may amplify vibrations possibly resulting in increased consolidation of the concrete adjacent to the affected reinforcement. Concrete with increased consolidation may change appearance near the local reinforcement, thus resulting in shadowing of the reinforcement.
- Use aggregates that match the color of the paste as closely as possible. A high contrast in color between the cement paste (including pigments) and aggregates will increase the tendency for shadowing effect.
- If a combination of heavy reinforcement and a particular concrete mixture design are cause for concern, consider constructing a mock-up using the designed reinforcement and mixture design, with anticipated production practices to evaluate the acceptability of appearance.

Note: Please complete this form and return to the Quality Control Manager. All crew members should be observant and report to their foreman anything out of the ordinary on a project. See something, say something.

NOTES	ATTENDEE SIGNATURES
_____ DATE _____ PRESENTER	_____ _____ _____ _____ _____ _____