



A Message from the **DIRECTOR OF TECHNICAL SERVICES**

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Caught In a Vice

Every once in a while, you hear something at an industry meeting that sticks with you.

That happened to me this week at the ACI Concrete Innovation Forum in Columbus. During his presentation, *Meeting the Needs of Hyperscaler Data Centers*, Thomas Van Dam, PhD, PE, Principal with Wiss, Janney, Elstner Associates, made the comment that concrete contractors are caught in a vise.

I thought, that's it!

That pretty well describes where concrete contractors find themselves today as our industry deals with Type IL and other blended cements.

On one side of the vise are owners and designers driving carbon reduction and more sustainable concrete. Carbon goals are finding their way into project requirements and specifications, and those requirements eventually make their way into the concrete mixture.

On the other side are the cement manufacturers and concrete producers tasked with providing materials that meet those requirements. We have seen the transition from traditional portland cement to Type IL portland-limestone cement, increased use of supplementary cementitious materials and more complicated blended cement systems.

Then there is the concrete contractor, right in the middle.

Think about it. In many cases, the contractor didn't establish the carbon requirement. We didn't manufacture the cement. We didn't select the raw materials, and we may have had limited involvement in developing or approving the concrete mixture.

But we still have to put it on the ground and make it work.

The concrete needs to pump, place and finish. We need to hit FF/FL requirements, meet appearance expectations, cure it properly and stay on schedule. And if the slab doesn't turn out the way everyone expected, who gets the first phone call?

Usually the concrete contractor.

That is the vise!

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The Material Has Changed

One thing I hear regularly from contractors is some version of, “We've been finishing concrete for 30 years. Why are we suddenly having these problems?”

It's a fair question.

For decades, experienced concrete finishers learned to read concrete. They knew what bleed water looked like, when they could get on a slab, how much time they had between finishing operations and how changes in temperature, wind and humidity affected their work.

That knowledge hasn't suddenly disappeared.

The material has changed.

Type IL is certainly part of the discussion, but I don't think we should make Type IL the sole focus. Today's concrete can include different cements, SCMs, admixture packages and combinations of materials that are very different from what many contractors worked with for most of their careers.

Does that mean every Type IL or blended cement mixture performs poorly? No.

Does it mean every problem occurring on a project using Type IL is caused by the cement? Absolutely not.

But it also doesn't make sense to pretend that changing the materials can't change the way concrete behaves.

Contractors are reporting differences in bleeding, setting characteristics, finishing windows, water demand and surface behavior. Just as important, we are hearing about variability. What works with one mixture or cement source may not work exactly the same with another.

That matters when you're the person responsible for putting 50,000 square feet of concrete on the ground that day.

Who Owns the Risk?

This is where I think our industry needs to have a much more direct conversation.

ASCC understands the industry's movement toward lower-carbon concrete and the forces driving the increased use of Type IL and blended cements.

Understanding is not the same as supporting.

More importantly, understanding why a material is changing doesn't answer the question of who carries the risk when that change affects construction.

I keep coming back to a simple principle:

Risk must follow responsibility.

Concrete contractors need to be responsible for the things we control. Means and methods, manpower, equipment, planning, placing, finishing and curing are our responsibility. If we make a mistake, we need to own it.

But what about the things we don't control?

The contractor doesn't control how cement is manufactured. We don't control a change in cement source or raw materials. We don't establish an owner's carbon-reduction goals. Often, we don't write the concrete specification or have final authority over the mixture.

So why should the contractor automatically assume the risk when one of those decisions changes the way the concrete performs?

That doesn't make sense.

Get the Contractor Involved Earlier

I don't think the answer is particularly complicated.

Get the contractor involved earlier.

If a project is going to use a concrete mixture that is significantly different from what has historically been used in that market, let's talk about it before the first placement.

What cement are we using? What SCMs? Has this mixture been used successfully before? Has the cement source changed? How does it bleed? What is the expected setting and finishing window? What happens when it's 95 degrees instead of 70? What happens in January instead of July?

And let's put some concrete on the ground.

A meaningful test placement or mockup can tell the project team things that a mix-design submittal simply cannot. A piece of paper can tell me compressive strength, w/cm ratio and mixture proportions. It can't tell a finisher exactly how that concrete is going to behave at 2:30 in the afternoon when the sun is out, the wind picks up and there are another six trucks waiting at the gate.

That is constructability.

It needs to be part of the discussion.

ACI recognized the importance of this long before Type II became part of our everyday conversation. ACI 302.1R says concrete for floors should have predictable setting characteristics and recognizes that cement-admixture combinations can create problems with setting and surface crusting. It also recommends that the concrete contractor have an opportunity to review the proposed mixture and participate in a sample placement to verify workability, finishability and setting time.

That raises a question I think our industry needs to answer:

CaughtDid we consistently do that when we transitioned to Type II?

Based on what ASCC is hearing from contractors, I think the answer in many cases is no. In some markets, the cement changed while the specifications, schedules and expectations placed on the contractor remained essentially the same. In other cases, contractors tell us they didn't know a significant material change had occurred until they started seeing different behavior in the concrete.

ACI 302 already recognizes something contractors know from experience: materials that meet the same specification don't necessarily behave the same in the field.

That's exactly why communication, contractor involvement and meaningful field evaluation matter.

We also need better communication when materials change during a project. If a cement source, SCM or other significant component changes, the contractor needs to know. Finding out because today's concrete suddenly isn't behaving like yesterday's concrete is too late.

If we change a significant component of the concrete, we need to understand what that change means before production—not after there is a problem.

Again, risk must follow responsibility. A contractor can't reasonably be expected to manage the risk associated with a material change if they weren't given the opportunity to understand and evaluate that change.

We Need a Better Process

Type II won't be the last major material change our industry deals with.

New cements, new SCMs, new admixtures and new technologies are coming. If we don't learn something from this transition, we are going to find ourselves having this same conversation again.

Maybe we need to look outside our own industry for a model.

Think about how the FDA approaches bringing a new drug to market. I'm certainly not suggesting concrete needs a 10- or 15-year approval process or that we create another regulatory system. But there is something worth learning from the process.

New drugs don't go directly from the laboratory to millions of people. There is a defined progression of testing, increasing scale, documentation, transparency and real-world evaluation. Problems discovered along the way become part of the information used to determine what happens next.

Why couldn't our industry develop its own version of that process?

A new cement or significant change in a cementitious system could start with laboratory evaluation, move to controlled field placements, then larger regional projects and eventually broader implementation.

Contractors need to be involved in that field testing because constructability cannot be determined from laboratory performance alone. We need to evaluate not only strength and durability, but also pumping, placing, bleeding, setting, finishing, curing, surface performance and variability under real jobsite conditions.

Just as important, the information needs to be shared.

What worked? What didn't? What changed? What did contractors experience in different climates and markets?

That transparency gives the entire industry an opportunity to adjust before a material is being used on millions of square feet of concrete.

This is where I want to challenge our trade associations.

ACI, ASCC, NRMCA, the cement industry and the other organizations representing the people who design, manufacture, produce and construct with concrete need to sit at the same table and develop a standard process for introducing significant material changes into the marketplace.

Not another 100-page document that sits on a shelf.

A practical process that establishes minimum expectations for laboratory testing, field trials, contractor involvement, communication, documentation, transparency and scaled implementation.

And then we need to hold ourselves accountable to using it.

Innovation and material changes are going to continue. Our industry needs a process that allows us to understand what those changes mean before the contractor is expected to figure them out with a truck at the pump and a crew standing on the slab.

Opening the Vise

The concrete industry is changing. Owners are establishing new expectations, and the materials being used to meet those expectations are changing with them.

ASCC understands the reasons behind those changes.

What we cannot do is allow all of the resulting risk to continue flowing downstream until it reaches the concrete contractor.

The owner has responsibilities. The designer has responsibilities. The cement manufacturer and concrete producer have responsibilities. And the concrete contractor has responsibilities.

We need to identify those responsibilities before the concrete is on the ground, not after there is a problem.

Because when the truck backs up to the pump, all the decisions made upstream become very real.

The contractor still has to make it work.

And if we want to loosen the vise contractors currently find themselves in, our industry needs to remember one simple principle:

Risk must follow responsibility.