

Collision Courses: Computers & Codes Clients & Contractors

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May 1, 2019

Severson
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A Professional Corporation

Agenda

- ❑ The Standard of Care
- ❑ Technical Adoption and Preservation in Practice
- ❑ Technical Design in Practice
- ❑ Codes, Clients, & Contractors

Ohio Architect's Code of Conduct

“[S]hall act with reasonable care and competence and shall apply the knowledge and skill which is ordinarily applied by registered architects of good standing, practicing in the same locality.”

- Ohio Admin Code 4703-3-07

Ohio Admin. Code Definitions

"Responsible control" - means that amount of control and detailed professional knowledge of the **content of technical submissions** during their preparation as is ordinarily exercised by a registered architect applying the required professional standard of care, including but not limited to an architect's **integration of information from manufacturers, suppliers, installers, the architect's consultants, owners, contractors, or other sources the architect reasonably trusts** that is incidental to and intended to be incorporated into the architect's technical submissions **when the architect has coordinated and reviewed such information.**

Care vs. Competence

“In practicing architecture, professional engineering, land surveying or landscape architecture, a licensee shall act with **reasonable care and competence**, and shall **apply technical knowledge and skill** which are ordinarily applied by architects, professional engineers, professional land surveyors, or landscape architects of good standing.” (Missouri Code of Conduct.)

Reality of “Shrinking” Accountability

- ❑ Construction Company suffers \$2M+ bid bust based on estimating software error.
- ❑ Court finds that “shrink wrap” limitation of liability limits software liability to the cost of the software.
- ❑ *M.A. Mortenson Co. v. Timberline Software Corp.*, No. 67796-4, 2000 WL 550845 (Wash May 4, 2000),

A Project Story



The Background

- ❑ New Developer – First Project
- ❑ Experienced Engineer, but first as a new firm
- ❑ Architects changed between DD and CD
- ❑ Initial Contract with Developer and then with Architect
- ❑ Project height limits dictates thin floors to be financially viable

The Players

Developer

- ❑ Single owner
- ❑ Trained as architect
- ❑ Past “project manager”
- ❑ First project as owner or developer

Contractor

- ❑ Established builder in concrete construction
- ❑ First ever project elevated mild reinforced slabs
- ❑ First time project manager

The Construction



Design Build Elements

Shoring System



Window Wall System

- ❑ 1 ¼ inch (or maybe 3 ½ inch) vertical tolerance
- ❑ Contract called for on-site measurements
- ❑ All pre-ordered before slabs poured

So what could go wrong?

- ❑ Computer designed slabs 7 inches with 30 foot spans
 - Using non-prevailing software – for first time
 - Some values may have been entered incorrectly
- ❑ Requires load deflection camber in forms
- ❑ Contractor has no experience with non-PT thin slabs
- ❑ Contractor uses wooden forms

What happened?

- ❑ Project 19 months late.
- ❑ 238 days spent “fixing” slab issues
- ❑ Over \$1M hard costs spent on slab fixes
- ❑ Ten years of claims
- ❑ Developer claims \$4.2M+ in damages
- ❑ Contractor seeks \$650K+ in extra costs

Computers & Codes

- Computer reliance and the standard of care:
 - Design dependence on computer
 - Cut & paste

- If the computer says it meets Code, does it meet the standard of care? Where is the factor of safety?

Historic Challenge to Technology Integration

- ❑ Insufficient Investigation
- ❑ Insufficient Commitment
- ❑ Difficulties with Company Integration & Education
- ❑ Incompatibility with Legacy Software
- ❑ Failure to Maintain & Preserve

Keys to Practice Success

- ❑ Evaluation & Intake
- ❑ Training with Standards
- ❑ Implementation within a Plan
- ❑ Maintenance & Preservation

Investigation

The Product

- ❑ Start with “why?”
- ❑ Look for industry endorsements
- ❑ Look for credibility and viability
- ❑ Consider support & resources

The Integration

- ❑ Inventory other products used
- ❑ Assess regular interface with others
- ❑ Assess integration support

Implementation

□ For Practice

- Training & Policies
- Suite of Software Checklist/Plan

□ For Projects

- For You
- From Others

Preservation

Design

- Preserve final design and inputs
- Preserve key milestones
- Avoid preservation of drafts and iterations except when reviewed with others.

Software

- Software
- Hardware

Another Project Story



The Project

- ❑ City Hall Project at cost of \$38M
- ❑ “Fast Track” Project
- ❑ Multi-Prime Contracting with 23 Contractors
- ❑ City uses Construction Manager – until terminated 50% into construction and taken in-house

So What Happened?

- ❑ Architect adds newly hired project manager six weeks before completion of construction documents
- ❑ New project manager unilaterally changes rounding factor in design
- ❑ Building won't "close" in shop drawings
- ❑ Takes six months to identify issue and the rains have then begun

Policies & Training

- ❑ Technical Manual/Policy
- ❑ Regular Staff Training
- ❑ New Staff Orientation
- ❑ Project Kickoff for Reinforcement and Intentional Variation

Keys to Project Success

- ❑ Identify the software/programs in the Professional Service Agreement
- ❑ Implement the Technology as Part of Plan of Action
- ❑ Follow QA/QC review from non-software basis at key milestones and at final design.
- ❑ Maintain final “program” **and software** consistent with document retention policies.

Identification

The Parties have agreed to use the following software/programs for the Project:

-
-

As such software/programs have been jointly selected, any programming issues with such software shall not create any liability for any party.

AIA Trust Disclaimer

Hard copies of the construction documents carrying Consultant's professional stamp shall represent the instruments of service and deliverable under this project. All other copies (printed or electronic) are for convenience only and shall not be relied on for any purpose. The use of any electronic drafting programs or other software in the preparation of the instruments of service is at Consultant's sole option for its own benefit and is not intended to create any rights or expectations on the part of Client.

Clients & Contractors

- ❑ Balancing client objectives of cost with performance and the standard of care.
- ❑ Does the contractor capacity for success impact the standard of care for engineers.

Informed Consent as the Key

- ❑ It's the client's project!
- ❑ Client should be advised of options and merits with its informed consent or "direction" to follow.
- ❑ The direction must be documented:
 - Counter-signed.
 - Confirming notification.
 - Meeting minutes (distributed).

Informed Consent

Client and Consultant have reviewed the design options and strategies consistent with the Client's program, budget, and site. Such options have both advantages and disadvantages. After consideration of the options and based on its own evaluation, Client has directed the Project design to proceed as set forth below:

Contractor Assumption of Risk

Contractor has reviewed the Project site and Project plans and specifications and warrants that it has the capacity to complete the Project as planned for the Project Budget and within the Project Schedule.

A Final Story



The Project

- ❑ New Hospital Building Among Existing
- ❑ Public Hospital
- ❑ \$750M Budget
- ❑ Ultimate cost \$882M

- ❑ Outside Owner's Representative Retained **Before** Architect

The “Reviews”

- ❑ By Owner’s Representative Throughout
- ❑ Contractor and Key Trades Retained for Constructability Review Beginning at 50% CD
- ❑ Outside Professional Peer Review at 90% CD
- ❑ Internally by Senior/Named Architect
- ❑ Handoff of BIM Model to Contractor Based on Foregoing at 100% CD stage

Really?

- ❑ Framing Subcontractor paid \$1.2M for Constructability Review
- ❑ Framing Subcontractor Completely Changes Team from Pre-Construction to Construction
- ❑ Framing Subcontractor Claims 200% Cost Overrun (\$20.4M) for Design Discrepancies/Lacking Information
- ❑ City settles for \$7.6M. Now what?

The BIM Control & Handoff

AIA E202

- ❑ Levels of Development
- ❑ Defined Accountability
- ❑ Retention of Intellectual Property Rights

AIA E203

- ❑ Transmission & Ownership
- ❑ Protocols
 - Digital Data
 - BIM
- ❑ Special Provisions

So How About . . .

Control of the Digital Project Model shall pass from the Designer to Contractor on _____.

___ At the time to transfer, Contractor confirms that the Model is complete and sufficient for purposes of completing its Scope of Work and Contract obligations.

___ Within ___ days of the transfer, Contractor shall confirm that the Model is complete and sufficient for purposes of completing its Scope of Work and Contract obligations.

A Wish

All plans, specifications, and manufacturers instructions are to be applied together such that if it is required or provided in one, it is required and implied in all.

Contractor shall plan its work sufficiently in advance its schedule to provide reasonable time for evaluation and response to any submittals, shop drawings, or requests for information without impacting the Project.

Contractor shall not be entitled to any compensation for late submission of such issues.

Your Questions & Comments

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