

**Lessons Learned: A Symposium on School Design  
LAUSD / USC School of Architecture / J . PAUL GETTY Trust**

**Session: 2C - Construction Type. Regulations**

**Scribe: Henry Buckingham**

**Attendees:**

Arnold Swanloern, Johnson Fain;  
Gail Dupree, AC Martin  
Barbara Helton-Berg, Blurock Arch  
Jorge Soto, Bryant, Palmer, Soto Arch  
Fernando Juarez, Fernando Juarez & Associates, Inc.  
Steven Olson, Architectonica  
Duane Fischer, Langdon Wilson  
Ann Trelease, Trelease Arch  
Keith Palmer, Bryant, Palmer, Soto Arch  
Johnathan Hu, Axiom  
Ken Cordova,  
Robert Mangurian, Studio Works  
Vivian , WLC Arch  
Arturo Fribourg, Escudero-Fribourg Arch  
Alice Kimm, Friedman/Kimm Arch  
Frank Dimster, USC School of Architecture  
Arpy Hatzikian, Design Advisory Committee  
Seth , TDM  
Shuman, LHA Arch;

**Key Issues:**

The subject for this session was **construction type and regulations**. While construction type was the main topic of conversation, subjects that the group continually returned to included budget, code interpretation and coordination with various agencies involved in school construction, primarily the LAUSD and the DSA. It was difficult to separate out cost, code and coordination issues from construction type because they affect one another.

The most common issue in reference to budgets was the appropriateness of the numbers allocated in different situations. Additionally, it was generally agreed that budget problems could be overcome by mitigating inefficiencies that were often built in to the programming of space in LAUSD schools. For example, the across the board requirement of 1 hr. construction, even where code does not require it, was seen as inefficient.

The LAUSD wants new school construction to take community needs into account so that there is a better fit between the school and the community in which it is located. There is a trade off between flexibility of use and the price paid for that flexibility, however, and this should be a consideration when budgets are allocated.

When it came to issues concerning code interpretation, differences between the designers' working assumptions and what was ultimately decided upon by either the DSA or the LAUSD, even if there was initially an agreed, shared interpretation, caused problems in the course of design development. This implies issues not only for designers working with these agencies, but also internal communication and coordination issues within those agencies.

**Key Issues:**

**Cost/ Efficiency:** Is type V the appropriate basis for school construction costs? Can schools be more efficiently programmed so that there is a better fit between construction type and use?

**Code:** Do some construction types not lend themselves to certain code requirements? To what extent does the code need to be analyzed prior to construction type selection?

**Coordination:** Can architects become involved earlier in the process (programming, code interpretation) in order to improve efficiency and reduce uncertainty? Can the communication and collaboration between the designers and the managers be improved?

### **Constraints, Problems, and Design Opportunities:**

#### **Budget Constraints:**

Relative to construction type, each type has inherent constraints, but these became problematic when combined with other issues. For example, while school construction budgets often assume type V construction, this type is not always workable. In the case of one school with three stories of classroom over parking, shear wall construction yielded classrooms deficient in window openings required by code. This same configuration may also make type V construction more expensive than type II. In another example, an adaptive reuse project assumed a budget that was too low when the occupancy change was applied to the existing structure, which was not well suited for the new use. This ultimately resulted in an increased budget.

#### **Program Constraints:**

In reserving flexibility of use for itself, LAUSD creates other problems associated with overbuilding and inefficiency. In one example, the school district did not have the program completely determined, so they wanted to retain the ability of locating K-2 children on the second floor of a school building, even though initially they did not anticipate such a use. This resulted in much stricter requirements for construction (building went from non-rated to 1 hour), and accessibility (dedicated egress from the second floor), and it wasn't clear that these extra measures were even necessary.

#### **Problems with Communication, Collaboration:**

Working out solutions with either the project managers of the LAUSD or the DSA often yielded inconsistent or problematic results: There wasn't always a clear line of communication between the designers and the agencies, and the impact of either agency varied depending on which manager looked at the project. In other words, code interpretation and budget constraints were not always consistent. Furthermore, correspondence tended to be adversarial, assuming a regulator / regulated relationship. In one example, a school under design development, which assumed that exiting balconies and open corridors were permissible for exiting, was not informed of a code change that changed the way the DSA interpreted exiting. This took place during design development and ultimately resulted in costly changes for the designers.

Making the relationship between school designers and the LAUSD/ DSA more of collaboration could improve this situation. Meeting early to work out what the constraints are on any given project was generally agreed to be necessary to make project development a smoother process.

#### **Opportunities:**

An opportunity that many architects seek is the expression of the construction type in the final building. One example mentioned was a campus that included a type II classroom building and type V buildings that housed other uses. The designers worked to make the construction types legible so that the difference between the buildings was easily understood.

Another opportunity that some designers sought was to improve the fit between the use of the building and its final configuration, an objective that was achieved with thorough research early in a project. While the benefits of this approach would seem obvious, some school programs were vaguely defined so that flexibility would be built in. This approach resulted in inefficiencies in some school structures.

While the most common construction types for school buildings were either type V or type II, one architect related their success in cutting costs using type III construction. In another example for a private school, the cost savings of using a (prefabricated) Butler building for a gymnasium was seen as an opportunity that the school district could benefit from. Finally the ability to migrate costs from one area of a project to another, rather than being

**Solution Types:**

**The most common construction types used included:**

Type II that combined CMU with metal braced frames, 1hr sprinklered.

Type V construction, 1 hr rated.

Both of these types were used in three stories of classroom space over ground level or subterranean parking, however type II with a braced frame was seen as the most efficient for this configuration.

**Types also mentioned included:**

Type III, 1hr

**Examples:**

**Examples mentioned included:**

East Valley High School #2 (Type II Steel & CMU)

East Valley High School #1B

East Valley Middle School #1: (Type II Concrete & Metal)

Jefferson Elementary School #2

Manual Arts Elementary School #3

Central Los Angeles Middle School #1

Arlington Heights Elementary School

Alta Loma Elementary School

**Recommendations:**

Make the relationship between the DSA, the LAUSD and the school designers more collaborative than adversarial. Early 'brain storming' meetings should include a free exchange of ideas not bound by convention.

Once a direction is set, architects and project managers from the LAUSD/ DSA should meet early to work out project constraints, code interpretation and budget. This would improve the fit & efficiency of the final product. The conclusions should be documented and shared.

Allow for a discreet phase of project development devoted to code analysis.

When allocating budgets, braced frame construction is a more appropriate basis for calculating costs than shear wall construction.

Costs should be allowed to migrate in project budgets: If money is saved in the parking areas, for example, it should be allowed to migrate to classrooms or playgrounds.

Allow consideration for the use of moment frames.

Allow for deferred approval.

Architects should determine what the exiting requirements are early.

Architects need to take initiative in problem solving rather than being a passive mediator of the forces at play.