The Mexicali Construction Process

FIVE PAGES EXCERPTED FROM
THE NATURE OF ORDER
BOOK 3
PAGES 551-555

In the photographs on page 549 and on the left, we see a small building that was built from hollow wooden columns, hollow beams, and lightweight basket vaults. This early version was built about 1973, but already contains the essence of the idea. In 1976 we began a much more carefully worked out project, described in the next few pages, where this kind of thinking was made available, and tested on a larger scale.

10 / THE PARADIGM OF SMOOTH UNFOLDING AS A TARGET FOR EVERY CONSTRUCTION TECHNIQUE

One of our greatest tasks — I believe — is to invent high-technology versions of such a process, so that it is easier to specify buildings; you start with a set of points in the ground, hardly more than that, and everything is generated from there, but with attention and with adaptation, so that the building becomes unique and so that the adaptation works out naturally.

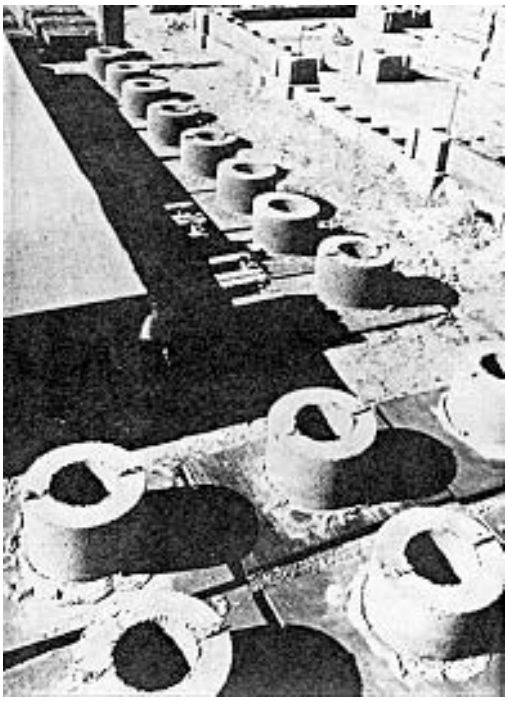
I have only rarely succeeded in such a beautiful unfolding using ultra-modern materials. One of the purest systems I invented that did have this quality was the system for the construction of our houses in Mexicali. We developed special blocks which could be used initially to lay out the building, then cast in with the slab poured over them to form the foundation. These blocks were cast with protruding reinforcing steel which stuck out and could be connected to slab reinforcing next to them. The blocks were placed on the ground and the protruding steel tied to the slab mesh. Then one could simply pour the slab.

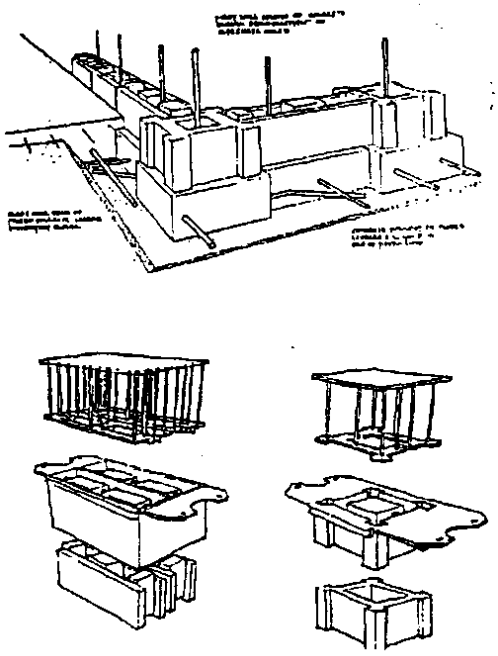
Foundation blocks after molding curing in our yard.

The walls came next. In the walls, the blocks which formed the corners were special corner blocks. These blocks, castellated like a four-sided turret, fixed the corners. Then the ordinary wall blocks fitted into them. The corners determined the position of the wall.

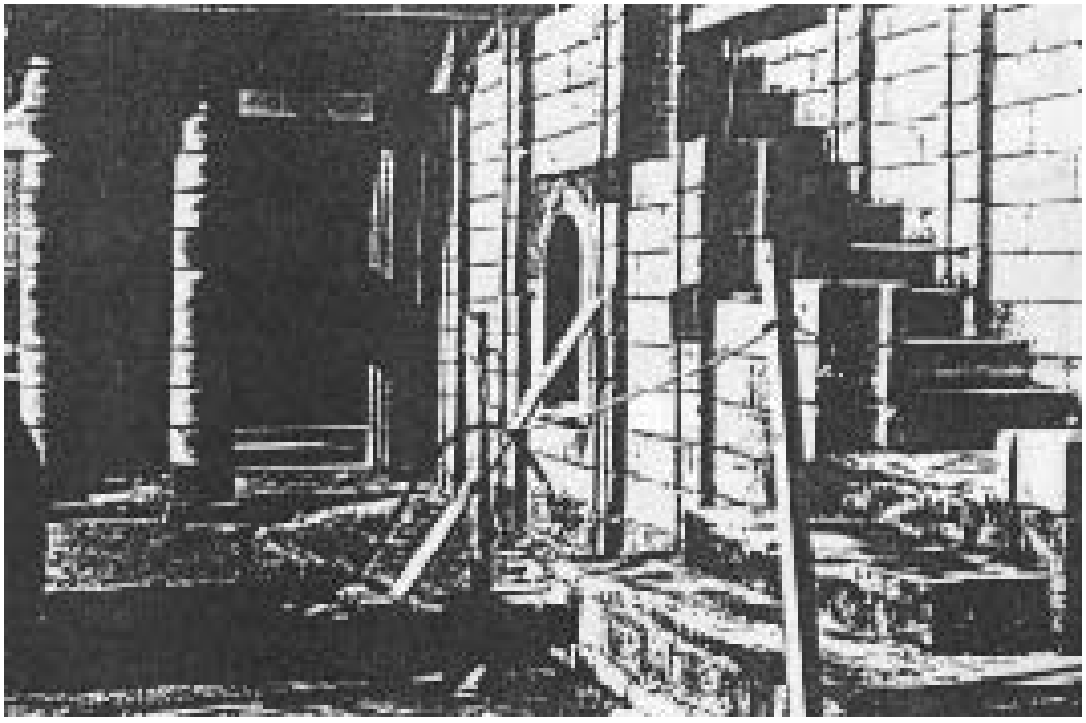
The perimeter beam on the top of the wall was made so that one could "wind-in" the basket lath to form the vaults. Once the wall top was made, two two-by-ten boards were placed. The vaults were woven in relation to these boards. When the vault basket was woven, it took its shape from the weaving, which took its angle from the way the basket lath was woven into this pair of boards. Next burlap was stapled on, then chicken wire. Then an application of a thin very light-weight, frothy concrete went over the burlap to form a half-inch shell. That shell became the formwork for the second, heavier concrete vault. The two boards which had anchored the basket became formwork for the wall-top beam: concrete was poured into these forms and held the vault in place.

So the whole house grew from a beginning in which, to start things off, one merely fixed the outline of the house by laying down corner foun-

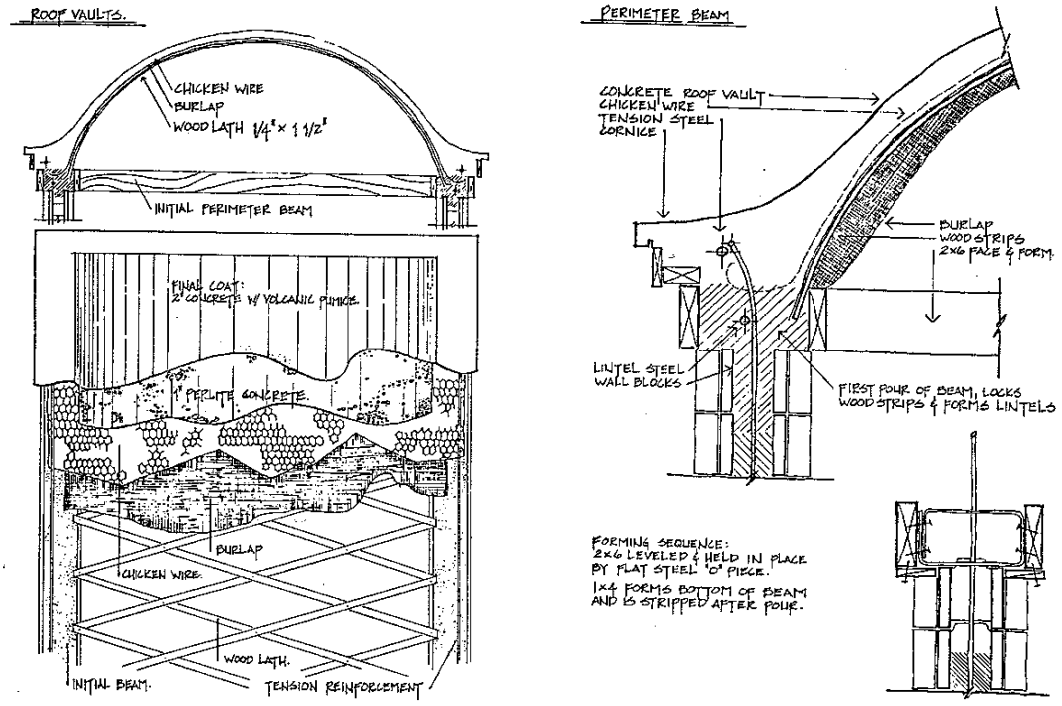




Left: Special blocks for the Mexicali project as we manufactured them. The design of these cylindrical blocks allowed round columns to be made, both beautiful in design and easy and cheap to make, thus allowing ''making'' to go one rather easily. Right: Two of the special molds we made for fabricating blocks. In the illustration on page 551, the foundation blocks with protruding reinforcing steel are clearly visible.



Dry stacked blockwork when walls are almost complete and have had some cells filled.



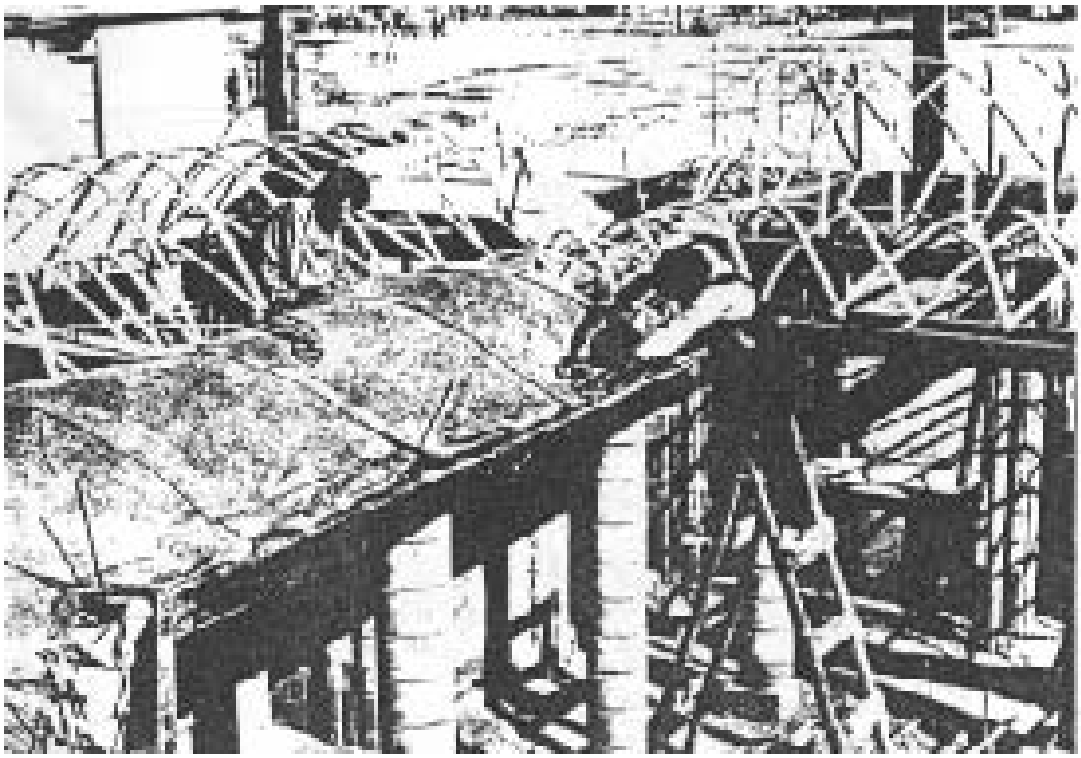
Left: Overview section, showing vault laid over basket of lattice strips. Right: Section through column and perimeter beam showing individually stacked hollow column blocks, reinforcing steel, and the wooden forms for the perimeter beams which stay in place after concrete is poured.

dation blocks. From there, each act followed the previous one, defining the structure as they were performed.

SEQUENCE OF CONSTRUCTION OPERATIONS

1. *Stake out the house with rebars driven into the ground to mark the corners.*
2. *Place corner rebar-blocks over each corner re-bar.*
3. *Place a line of bar blocks between each corner block.*
4. *Place steel and mesh, then pour the slab.*
5. *Place corner turret blocks to form corners.*
6. *Place wall blocks fitting into corner blocks.*
7. *Locate windows and window sills as the walls are going up.*
8. *Place a pair of two-by-tens to form perimeter beams.*
9. *Place reinforcing steel in the beam, place conduit and plumbing lines, and pour the beams.*
10. *Use the perimeter beams to place lattice strip to weave baskets for vaults.*
11. *Once the baskets are woven, fix each crossing of lattice strips with one fine nail to stabilize the flexibility of basket.*
12. *Staple burlap and chickenwire over basket.*
13. *Pour a thin, ultra-light-weight frothy concrete to form a one-inch shell (aggregate is perlite and insulation fiber).*
14. *When the one-inch shell is hard and cured, place a second shell of about three inches in a heavier and denser lightweight concrete.*
15. *Fit window frames and door frames.*
16. *Using special simple sash construction made out of two-by-two material, build sash and doors to fit the openings.*
17. *Place finish material on floors.*
18. *Whitewash the interiors.*
19. *Complete plumbing and electrical fixtures.*

More, and higher-technology versions of this kind of process are needed. It is cheap. It allows houses to be different. It requires no drawings. It is very sophisticated technically.



Stapling the burlap overf the woven baskets once the baskets are complete.

Our manufacture of special interlocking earth-cement blocks designed to be placed in a way that allows unfolding to proceed smoothly and without backtracking.

Fountain and community building, Mexicali. Christopher Alexander, Julio Martinez, Howard Davis, Don Corner, students and families, 1976.

In general, I believe one may say that the most sophisticated techniques are the ones where each operation fits, without trouble, into the output from the previous operations. The technique allows a construction process which goes sequentially from one step to the next, with no backtracking, and without a need for complex drawings because each operation is sufficiently well-defined by the context of the previous operations.

A part of the community of houses built using this technique of unfolding. Without introducing any additional construction cost, each house turns out unique and different according to its situation.