

700 1000

ECONOMIES IN CONCRETE FORMWORK

Formwork, by definition, is a temporary structure used to contain fresh concrete to form it to the required shape and dimensions, and support it until it is able to support itself. Formwork includes the surface in contact with the concrete and all necessary supports.

Formwork is the largest single cost segment of the concrete structural frame, often more than 50 percent. Project specifications can influence formwork design and speed of construction by giving consideration to such items as: stripping time, form selection, tolerances, concrete finish requirements, strength of concrete, and reinforcing steel and accessory requirements.

FLOORS

Repetitive modular dimensions assist in achieving maximum efficiency and tend to reduce the possibility of errors.

Repetitive floor heights produce efficiency in materials and lower cost due to less adjustment in shoring.

Column capitals are part of the floor structural system and expensive to form. Consider the use of shear head reinforcing within the floor slab thickness if practicable. If capitals are necessary, strive to use the same size and shape throughout the project.

Keep the bottom side of flat slabs, joists, and dome systems level for maximum economy. Accomplish sloping of floor surfaces or depressions by varying the structural slab thickness or by use of concrete fill. Vary the top slab surface rather than adjusting formwork beneath the slab.

Show location of electrical and mechanical inserts and penetrations on the structural drawings. Electrical and mechanical attachments to the formwork impede stripping of the formwork. Use sleeves or block-outs to speed construction.

Perimeter overhangs at floors and roofs are expensive to form.

Exact location of construction joints should be the contractor's prerogative. However, permissible areas for such joints should be shown on the structural drawings.

Proper joint location will reduce cost by maximizing form reuse.

BEAMS

Keep the beam size constant for a line of continuous beams and vary the reinforcement from span to span.

Wide flat beams of the same depth as the slab are easier to form than beams projecting below the bottom of the slab.



Beams should be as wide as, or wider than, the columns into which they frame.

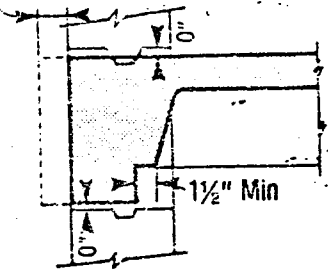
COLUMNS

Standardize column location in uniform pattern in both directions using the same orientation for as many columns as possible.

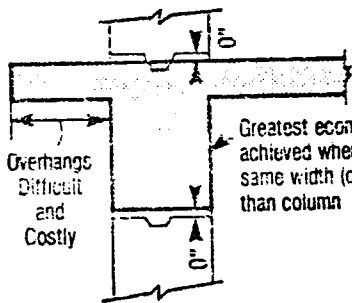
If column sizes cannot be kept the same size throughout the building, change sizes in 2-inch increments, one side at a time (24" x 24" to 24" x 22", then 22" x 22" for example,) thereby permitting gang forming possibilities.

Use the same column shape as often as possible.

Spandrel projections beyond face of column are difficult and costly.

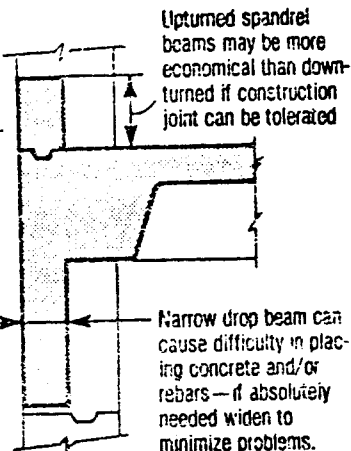


Construction Joint at top and bottom of Spandrel Beams-typical.



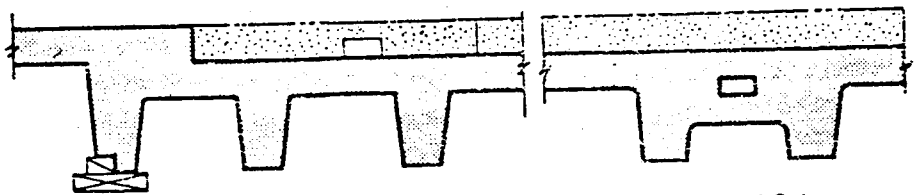
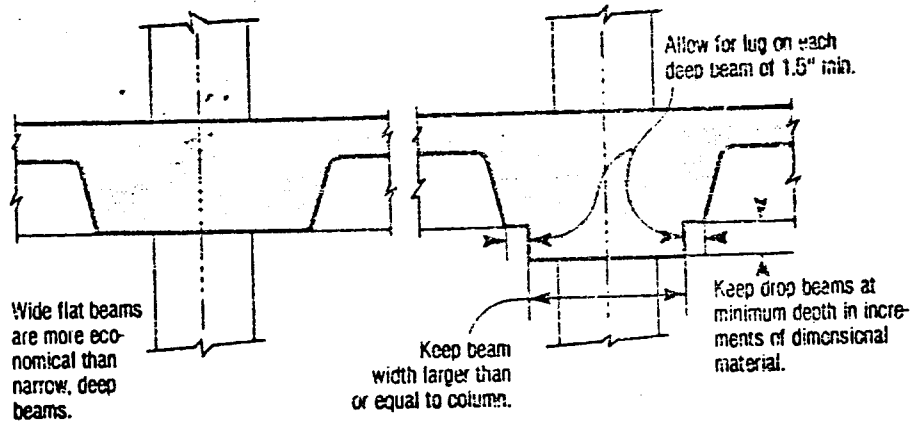
Overhangs Difficult and Costly

Greatest economy achieved when beam is same width (or larger) than column



Upright spandrel beams may be more economical than down-turned if construction joint can be tolerated

Narrow drop beam can cause difficulty in placing concrete and/or rebar - if absolutely needed widen to minimize problems.

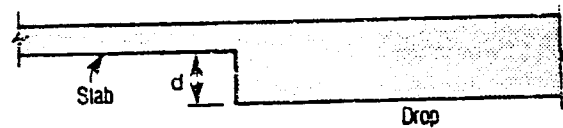


Electrical underfloor duct system can be installed more economically in filled slab due to:

1. Reduced construction time.

2. Lightweight concrete fill increases fire rating.
3. Structural slab can be rough screeded.

Alternate method: Reduce depth of form to allow for underfloor duct system.



For economy, "d" should be some combination of actual lumber dimensions.

Nominal Lumber Dim.	Actual Lumber Dim.
2 x	1 1/2"
4 x	3 1/2"
6 x	5 1/2"
8 x	7 1/4"