Pour Strips Elimination at the Upper Levels in PT Parking Structures

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April 28, 2015
Pour Strips

Pour Strips are provided to temporarily isolate the post-tensioned floor system from restraining columns or walls to reduce the effect of volume changes on the structure.
Pour Strip
Benefits of eliminating the pour strips

- Pour strips require extra mild reinforcement. Elimination of pour strips minimizes the reinforcement.
- Simplified forming - no or fewer re-shoring is required, which frees’ up floor space and reduces obstacles for all trades
- No special concrete mixes are required (mixes that require polypropylene fibers)
- Narrower width of traffic topping is required (typically a 6-ft. wide traffic topping over the pour strip can be reduced to a 2-ft. wide traffic topping at the construction joint)
Benefits of eliminating the pour strips (cont.)

- Elimination of one sealant joint per strip, plus all the orthogonal joints
- Fewer joints mean less maintenance
- Safer working environment as there is no opening (hole) in the slab
- Potential of saving two weeks in schedule, usually at the end of the project
Pour Strips

- Design pour strips as cantilevers to simplify intensive re-shoring operations
- Recommend keeping the pour strips at the first supported level, but eliminate at upper levels
Pour Strips

Per Post-Tensioning Manual, 5th edition, figure 5.25:
About 40 percent of shrinkage or creep takes place within the first 28 days

Fig. 5.25 — Approximate proportion of final shrinkage or creep vs. time
CONTRIBUTION OF DIFFERENT FACTORS TO TYPICAL SLAB SHORTENING*

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHRINKAGE</td>
<td>66 %</td>
</tr>
<tr>
<td>CREEP</td>
<td>11 %</td>
</tr>
<tr>
<td>ELASTIC SHORTENING</td>
<td>7 %</td>
</tr>
<tr>
<td>TEMPERATURE</td>
<td>16 %</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100 %</td>
</tr>
</tbody>
</table>

*For a parking structure in Southern California
Source: Restraint Cracks and their Mitigation in Unbonded Post-Tensioned Building Structure
By Bijan O. Aalami and Florian G. Barth, Post-Tensioning Institute, 1988
## CONTRIBUTION OF DIFFERENT FACTORS TO TYPICAL SLAB SHORTENING WITH A POUR STRIP STRIPE

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>MOVEMENT inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 TO 28 DAYS BASED ON HALF STRUCTURE</td>
<td>BEYOND 28 DAYS BASED ON FULL STRUCTURE</td>
</tr>
<tr>
<td>SHRINKAGE</td>
<td>0.13</td>
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<tr>
<td>CREEP</td>
<td>0.02</td>
</tr>
<tr>
<td>ELASTIC SHORTENING</td>
<td>0.07</td>
</tr>
<tr>
<td>TEMPERATURE</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.22</td>
</tr>
</tbody>
</table>
Pour Strips

In our example the movements are as follow:

• Equivalent movement at each end = 0.95” without pour strip
• Equivalent movement at each end = 0.85” with a pour strip that remains open for 28 days
Pour strip at all tiers

SAP2000

SAP2000 v9.0.8 - File:Frame-3bay_5Story_0.85 - Longitudinal Reinforcing Area (ACI 318-99) - Kip, in, F Units
Pour strip at first supported tier only
Pour strip at all tiers

$\Delta = 0.85''$

$\Delta = 0.85''$

$\Delta = 0.85''$

$\Delta = 0.85''$

$\Delta = 0.85''$
Pour strip at first supported tier only

Δ = 0.95”

Δ = 0.95”

Δ = 0.95”

Δ = 0.95”

Δ = 0.85”
Thank You