

DESIGN OF SLAB REGIONS AT WALL SUPPORTS IN FLOOR PRO

First draft March 21, 2007

This Technical Note describes how the Floor Pro program handles the design of floor regions that are over, or within the immediate vicinity of wall supports. It covers the slab design subsequent to a successful analysis of the floor system, where the program checks the floor for code compliance and the calculation of reinforcement.

DESCRIPTION OF CONDITIONS

Figure 1 is a partial view of a design strip showing a support line, its tributary and two walls. The following apply to the treatment procedure described.

- ❖ There is no restriction on the support line to either cross or clear the walls.
- ❖ There is no restriction on the relationship between the support line and the position or number of supports. The figure shows no supports.
- ❖ The walls can be partially or entirely within the design strip.
- ❖ There is no limitation on the number of walls.

CREATION OF WALL-SPECIFIC DESIGN SECTIONS

In addition to the generation of the regular design sections, the program generates several additional sections that are determined by the number and position of the walls. Figure 2 shows the position of design sections that are specific to the presence of the walls. There will be two additional sections at each tip of a wall, or wall groups. A "wall tip" is defined as the closest point on a wall outline to a normal to the support line.

There will be one design section (marked 1) a distance "a" from the tip of the wall. The second section will be a distance "a" from the wall tip, but within the outline of the wall (marked 2).

The distance "a" is a value read by the program from its initialization file (wall_tip_section_clearance). The default value of the program for is as follows:

Wall_tip_section_clearance = 2 inch ; 50 mm

CREATION OF STANDARD DESIGN SECTIONS

The remainder of design sections will be generated in the standard manner of the program. As illustrated in Fig. 3 these will extend from one end of the support line to the other end without considering the presence of the walls. In Fig. 3, the wall-specific sections are marked "1" and "2." The standard sections are marked "i." For clarity, the sections that pass through one or more walls are shown with thick lines.

DESIGN OF SECTIONS THAT PASS THROUGH ONE OR MORE WALLS

For design, regardless of the building code used, and whether the floor is conventionally reinforced or post-tensioned, the sections that pass through a wall will be code checked for "serviceability" condition only, if so requested by the user. In other words, these sections will not be code checked for "strength" condition. The underlying argument is that a wall supported slab region would not collapse.

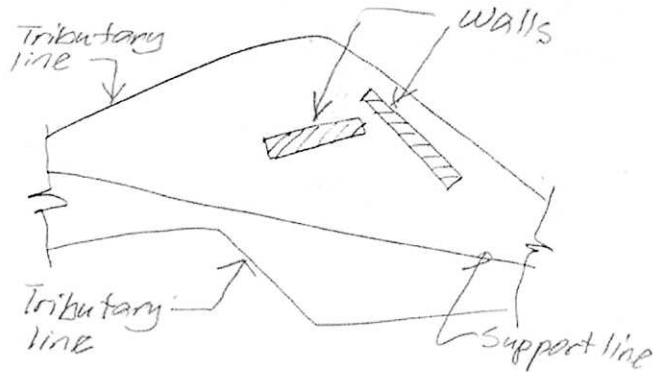


FIGURE 1 DESIGN STRIP WITH WALLS

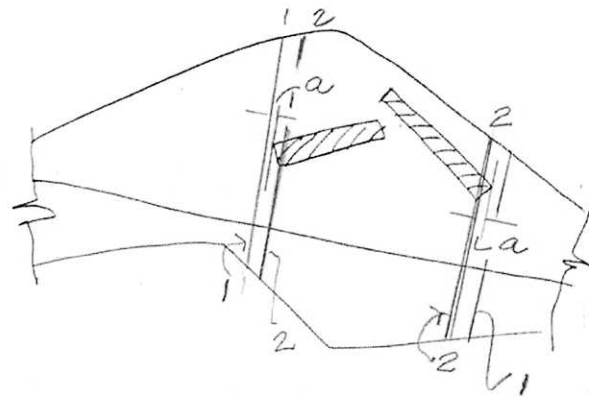


FIGURE 2 WALL-SPECIFIC DESIGN SECTIONS

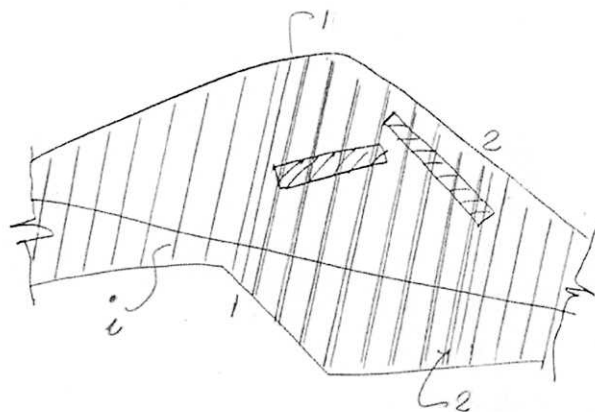


FIGURE 3 ENTIRE DESIGN SECTIONS