TENDON AND STRAND DEFINITION

This clarifies the definition of “strand” and “tendon” and their input in ADAPT Floor Pro.

“Strands” used in post-tensioning are made up of seven wires. There is a central straight wire with six wires wrapped around it in a spiral form. Strands come in various diameters. The common strands used in post-tensioning are 12 mm and 15mm “nominal” diameters (sometimes referred to as 13mm and 14.7mm). The cross-sectional area of these strands are: for 12mm between 98 and 99 mm². For 13mm the cross-sectional area is 152 mm².

A tendon contains one or more strands. In the following a typical tendon used in UAE is shown with three strands.
This page and the page that follows, provide additional information on tendon geometry. Note that “tendon diameter” does not affect the analysis and design of a project. CGS governs the analysis and design. Tendon diameter and the “z” parameter are used only in the generation of the shop drawings.

9-11-99

Tendon input parameters
prior to mapping

$A_t = \text{area of steel in each tendon}$

$z = \text{distance of tendon center to center of steel, this is zero for mono strand}$

$F_{se} = \text{effective force in prestressing steel}$

This is a user input

Hence, force in tendon = $F_{se} \times A_t$

$F_{tendon}$
Tendon layout

9-11-99

cover

cos

Tendon duct

cover

multistrand

cos

cos

(a) Tendon cover & cos

Input to Program

Tendon dia

$z = \text{EQ} \times \text{EQ}$

$z$ is distance between center of geometry of Tendon duct and center of force in tendon.

Analysis based on $z$, but placement and interference on center of geometry