

Modelling a tapered pile

Using the cone command in PLAXIS 3D 2013 / 3D AE / 3D Classic

To create a cone for a tapered pile

1. use the command for PLAXIS 3D AE:

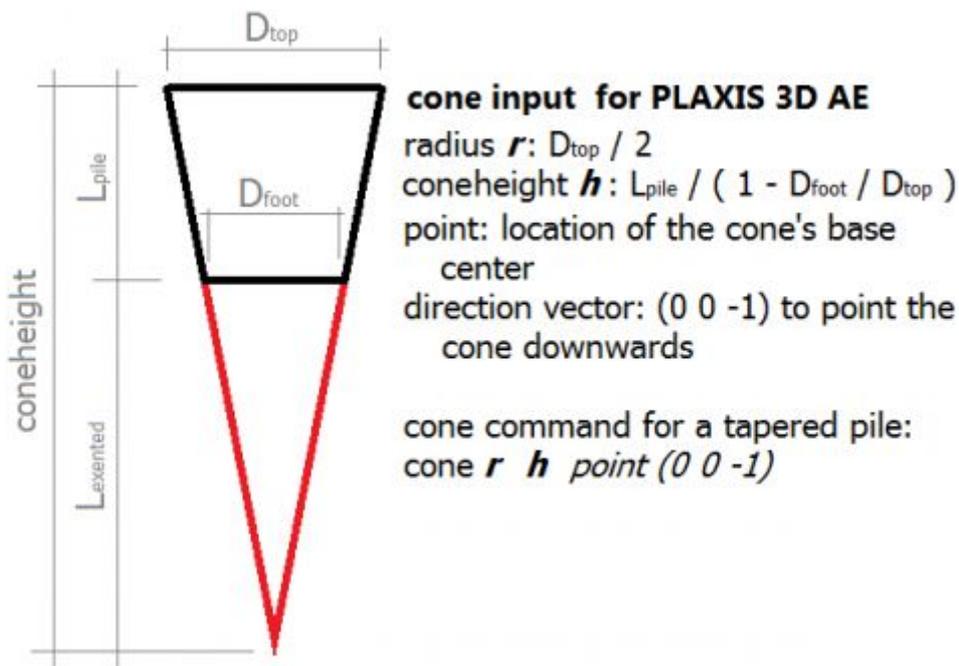
`cone <radius r> <coneheight h> <point> <direction vector>`

or for earlier versions (3D 2013 or earlier), use this command with the *accuracy* parameter:

`cone <radius r> <coneheight h> <accuracy> <point> <direction vector>`

with

- *radius r* = $D_{top} / 2$ (D_{top} is diameter at the top of the pile)
 - *coneheight h* is determined by $h = L_{pile} / (1 - (D_{foot} / D_{top}))$
 - *accuracy* gives the number of segments along the circumference of the cone. Note was needed prior to PLAXIS 3D AE.
 - *point* is the center point for the cone's base
 - *direction vector* tells in which direction the cone should be pointing. For a vertical tapered pile this should be (0 0 -1)
 - Note: the cone command only creates a shell, not the volume.
 - For more details on the cone command, please refer to the *Commands reference* (in the Help menu)
2. at the foot level, insert a horizontal surface larger than the cross sectional area of the tapered pile at this level
 3. now intersect the cone and surface: multiselect the cone and the surface, right click the selection and choose intersect
 4. now remove the redundant parts: the extended surface and the cone part below the pile foot level
 5. make sure to add a surface to cap the cone to create a closed body within the surfaces.
 6. when one wants to model soil-structure interaction, interfaces should be introduced. Select the cone (and the bottom), and apply outside interfaces to all these surfaces



This concludes the geometry creation. To activate the pile for the calculation, make sure to change the soil material inside the pile volume into the pile's material in the appropriate phase including activation of the interfaces.