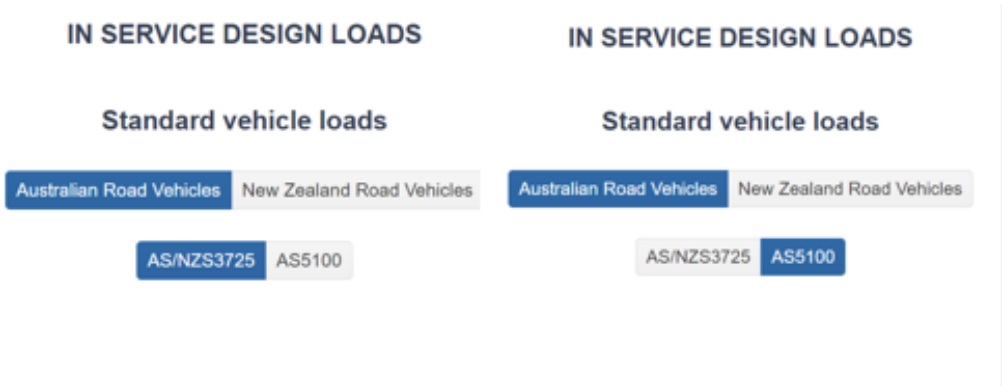
PIPECLASS3
Peace of mind for sustainable infrastructure

USER TIP: Assumptions Used for Distribution of In-Service Loads

A major update in **PIPECLASS3** is the inclusion of the ability to apply AS5100.2:2017 distribution of loads.

PipeClass 2 provided for adopting the footprints and loads of vehicles nominated in AS5100 however maintained the calculating of load on the pipe using the distribution method and calculations in the product specific design standard AS3725:2007 Design for installation of buried concrete pipes.

Choosing the method of distribution is simple. In the In-Service Design Load section you can toggle between AS/NZS 3725 and AS5100, your choice governing the method of distribution.



Understanding the difference between the two methods of distribution is essential.

Choosing AS3725:

The wheel footprint are consistently 200mm x 500mm for all load cases.

The distribution length is calculated utilising the formulae

$A = L1L2 = (b + 1.45H)(a + 1.45H)$

Where $L1 = (b + 1.45H)$

$L2 = (a + 1.45H)$

Choosing AS5100:

The wheel footprint is

250mm x 400 mm for W80 and A160

200mm x 400mm for S1600 and M1600

The area of distribution is calculated utilsing the formulae

$A = L1L2$ = (b -140 +1.2H)(a-140 + 1.2H)

Where $L1 = b$ -140 +1.2H

$L2$ = a-140 + 1.2H

The choice determines the area of distribution of load on the pipe.

The adoption of the AS5100 distribution significantly increases the estimated working live load on the pipe as it reduces the area of distribution due to the angle which the load is distributed through the fill. Although the CPAA recognises it is Road Authority choice to adopt AS5100 distribution for major highways, it is a very conservative approach for buried structures of relevantly small proportions such as concrete pipe. Added conservatism is due to the fact that bedding factor (load reduction due to installed soil support) is limited to 1.5 for all live loads in AS3725. The different approaches to design of products covered by specific Australian Standards is recognised in AS5100 Part 1 Scope and general principles where it states that it does not apply to culverts and other structural components that are covered specifically by other Australian Standards.

It is suggested that adoption of AS/NZS 3725 load distribution is appropriate and should be utilised for buried soil supported pipes in subdivision and local roads.