RECOMMENDATIONS FOR SIZING HORIZONTAL FINAL PIPEWORK

In order to determine the simultaneous coefficient, apply the recommendations from the DTU.
Supply direct flush systems separately.

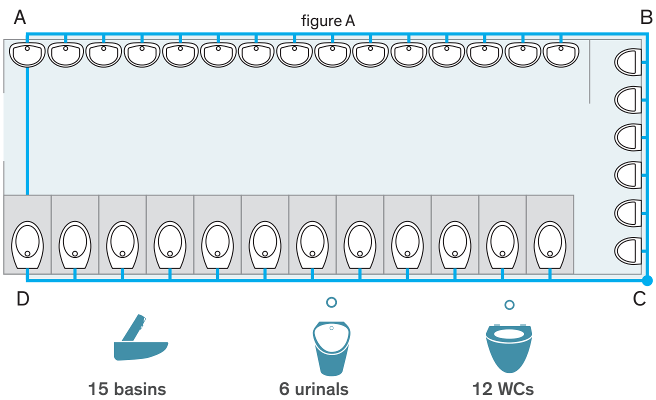
TABLE 2 / CALCULATION RULES FOR CONSIDERING SIMULTANEITY

	BASINS	SHOWERS	URINALS	SIPHON ACTION URINALS	WCs
Base flow rate (Q min.)	**0.05 L/sec.**	**0.10 L/sec.**	**0.15 L/sec.**	**0.25 L/sec.**	**1 L/sec.**
Simultaneous coefficient (Y)	$\frac{0.8}{\sqrt{(x-1)}}$ *	$\frac{0.8}{\sqrt{(x-1)}}$ *	$\frac{0.8}{\sqrt{(x-1)}}$ *	$\frac{0.8}{\sqrt{(x-1)}}$ *	**3 valves installed:** 1 valve operating **4 to 12 valves installed:** 2 valves operating **13 to 24 valves installed:** 3 valves operating **25 to 50 valves installed:** 4 valves operating **more than 50 valves installed:** 5 valves operating.
Design velocity (V)	**2 m/sec.**				

*The formula presented here is with regards to general use.
In the event of intensive use due to spikes in consumption (schools during break time, stadiums during half time, etc.), consult the project manager in order to establish the adequate level of simultaneity.
The constant of 0.8 can therefore be increased to a maximum of 2.

1. Collect installation data for each branch

Example:



2. Calculate the design flow rate per installation branch

Add the base flow rates from the different fittings.
See Q min. calculation table 2.

• ABC branch: basins urinals

Gross flow rate

	Branch	Number of fittings		Min. flow rate (Q min.)		Gross flow rate (Q)
	AB	15 basins	X	0.05 L/sec.	=	0.75 L/sec.
	BC	6 urinals	X	0.15 L/sec.	=	0.9 L/sec.
		21 fittings		Gross flow rate (Q min.)	=	1.65 L/sec.

Simultaneous coefficient

To determine the simultaneous coefficient, follow the recommendations in *table* 2 and apply the formula:

$$Y = \frac{0.8}{\sqrt{(x-1)}}$$

Probable flow rate

The multiply the gross flow rate (Q) with the simultaneous coefficient (Y) in order to determine the probable flow rate.

Gross flow rate (Q)		Simultaneous coefficient (Y)		Design flow rate
1.65 L/sec.	X	$\frac{0.8}{\sqrt{(21-1)}}$	=	0.30 L/sec.

• CD branch: Direct flush systems

Gross flow rate: 1 L/sec.

	Branch	Number of fittings
	CD	12 WCs

Simultaneous coefficient

For direct flush, follow recommendation in *table 2*.
For 12 flush valves installed, there will only be 2 used simultaneously.

Probable flow rate

Min. flow rate		Number of valves counted		Probable flow rate
1 L/sec.	X	2	=	2 L/sec.

3. Choice of pipework diameter: using the Darius Abacus chart

Reading the DARIUS ABACUS

Mark the design flow rate and the design velocity, join these points with a ruler.
The diameter and pressure drops can now be read on the corresponding scales.

• ABC branch: basins & urinals

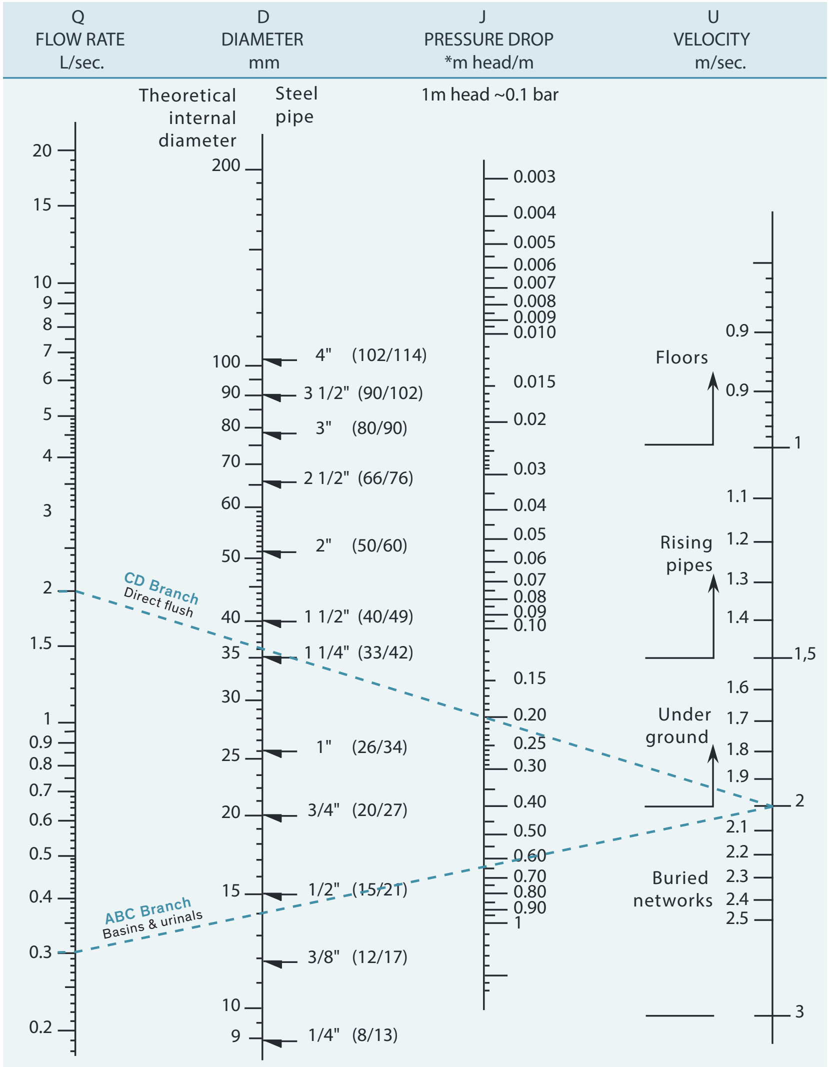
(V) Design velocity = 2 m/sec.
(Q) Design flow rate = 0.30 L/sec.

- Ø minimum interior of final horizontal pipework: 14mm

- **CD branch: direct flush**

(V) Design velocity = 2 m/sec.
(Q) Design flow rate = 2 L/sec.

- Ø minimum interior of final horizontal pipework: 36mm



4. Pressure drop

In line with the rules of use, the pressure drop should be checked in the whole installation so as to confirm the choice of diameter.

There are 3 types of pressure loss to consider:

- Regular (or linear) pressure drops concerning the installation. They are linked to friction in the pipework.
  The material (copper, multilayer, PEX, iron) used for the pipework also plays a role.
- Slopes (or variation in altitude) in the installation.
- Specific (or individual) pressure drops are linked to the equipment (water meter, pressure reducers, boilers, group thermostatic mixing valves, elbows etc.).
  Contact manufacturers for more information.

Then check that the residual dynamic pressure is sufficient at each point-of-use.

If the drops in pressure are too significant to supply the furthest valve, choose a larger diameter or use a tank with a pressure pump (contact manufacturers).