Discharge through entire pitch sub-base and external soakaway

Consider Area to be drained = 10080 m²

100 year + 40% climate change

Flow	Time (min)	M5-D 20mm x Z1	Z2 factor	M100-D (mm)	Inflow M³		Outflow M³	Storage M³
	5	7.6	1.862	14.2	199.7		24.7	174.99
	10	10.8	1.926	20.8	293.5		49.4	244.11
	15	12.6	1.958	24.7	348.2		74.1	274.01
	30	16.0	1.998	32.0	451.1		148.3	302.84
	60	20.0	2.030	40.6	572.9		296.6	276.36
	120	24.0	2.014	48.3	682.1		593.2	88.94
	240	29.2	1.978	57.8	815.1		1186.3	0
	360	32.0	1.954	62.5	882.4		1779.5	0
	600	36.6	1.914	70.1	988.6		2965.9	0
	1440	45.6	1.842	84.0	1185.3		7118.1	0

Ratio r = 0.4 (For locality)   Climate change allowance = 40%

Outflow   _Infiltration through pitch sub-base_

Infiltration rate: 0.0004896 m/min

Soakaway details: 80 m wide   126 m length   0.38 m deep
Assume void ratio 0.4   .: 1532 m³

Available storage under pitch (based on 1:100 fall): 182.00 m³

Available storage within drainage system: 95.00 m³

Available storage area = 277.00 m³

Surface area: 10080 m²

Additional external soakaway

Infiltration rate: 0.0002652 m/min

Soakaway details: 10 m wide   3 m length   1 m deep
Assume void ratio 0.95   .: 29 m³

Surface Area: 30 m²

Eff volume: 307.00 m³ > 302.84 m³ OK

Additional storage volume required: -4.16 m³

Half drain down time (soakaway only): 3681.8 secs   1.02272 hours

Total Storage required = approx. 303m³. Storage provided under the pitch = 277m³. Approximately 26m³ of additional storage will be required.
An external soakaway to the south of the pitch with dimensions 10m x 3m x 1m depth with 95% void ratio provides sufficient additional storage to accommodate the additional flows.
This volume will accommodate flows from all modelled 1 in 100 year + 40% climate change events.
In order to meet building regulation stanards, a half drain-down time of 24 hours should be achieved. This requirement is met at the site.