SURFACE WATER, STORMWATER, SOAK PIT & DRIVEWAY RUNOFF

Common queries our Building Advisory and Building Control Officers receive seek clarification on our interpretation on surface water collection including soak pits and driveway runoff. To help you we have summarised the requirements to aid you with the processing of your building consent and avoid confusion on site during your build.

Please note that the below information is intended as a guide only, and you need to ensure you are referring to the relevant legislation to confirm that your building project meets requirements.

Surface water

As with any aspect of building, Selwyn District Council (SDC) refers to the Building Act 2004, the New Zealand Building Code (NZBC), and associated building regulations.

E1 Surface Water of the NZBC which provides a clear description of the objective, functional requirement and performance as follows:

Objective

E1.1 The objective of this provision is to:

a) Safeguard people from injury or illness, and other property from damage, caused by surface water, and
b) Protect the outfalls of drainage systems.

Functional requirement

E1.2 Buildings and sitework shall be constructed in a way that protects people and other property from the adverse effects of surface water.

Performance

E1.3.1 Except as otherwise required under the Resource Management Act 1991 for the protection of other property, surface water, resulting from an event having a 10% probability of occurring annually and which is collected or concentrated by buildings or sitework, shall be disposed of in a way that avoids the likelihood of damage or nuisance to other property.

Definitions

Outfall: That part of the disposal system receiving surface water or foul water from the drainage system. For surface water, the outfall may include a natural water course, kerb and channel, or a soakage system.

Other property: Means any land or buildings or part thereof which are:

a) Not held under the same allotment; or
b) Not held under the same ownership – and includes any road.

Stormwater & soak pits

In consideration of E1, stormwater design local requirements need to be taken into account.

The Environment Canterbury (ECAN) Global Stormwater Consent CRC162164 (commencement date 5/11/2015) governs onsite stormwater design.

Under this Consent, the following criteria must be met:

a) The system shall collect, treat and dispose of stormwater from all rainfall events up to and including a 24 hour duration 2% Annual Exceedance Probability rainfall event (1 in 50 year return period).
b) The base of the stormwater system shall be located at least one metre above the seasonal high water table.

Therefore the key areas to be addressed in all building consent applications are:

	Source of information
a) Means of Compliance (noted on consent application form) - Acceptable Solution (AS1) - Verification Method (VM1) - Alternative Solution	https://www.building.govt.nz/building-code-compliance/e-moisture/e1-surface-water/acceptable-solutions-and-verification-methods/
b) Appropriate outfall (noted on site plan) - Soak pit - Kerb and channel - Land drainage	Project Information Memorandum (PIM) - can be applied for prior to building consent application
c) Catchment area (noted on roof/site plans) - Roof - Hardstand (i.e. concreted areas)	Area measured off the proposed plans
d) Soakage rate (calculations provided in supporting documents) - Litres/min - mm/hour	https://www.building.govt.nz/building-code-compliance/e-moisture/e1-surface-water/acceptable-solutions-and-verification-methods/
e) Soak pit (noted on site/drainage plans) - Size - Location - Construction	https://www.building.govt.nz/building-code-compliance/e-moisture/e1-surface-water/acceptable-solutions-and-verification-methods/

Calculations in your building consent application need to show the correlation between the catchment area, soakage rate and size of the soak pit.

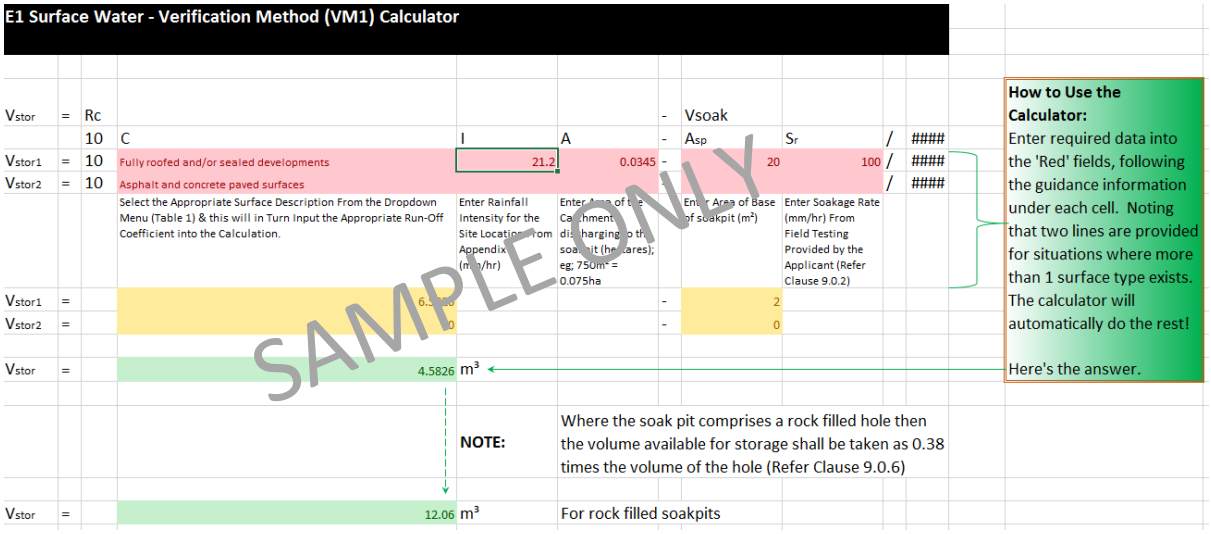
To comply with the NZBC you will need to provide sufficient evidence to satisfy the functional and performance criteria of NZBC Clause E1 Surface Water.

Soak pit calculations

a) E1/VM1

The VM1 calculator can be used with zero soakage for an alternative solution as a form of evidence to support your application.

The below is an example of a tool to calculate soakage rate:



E1 Surface Water - Verification Method (VM1) Calculator

Vstor	=	Rc				-	Vsoak				
		10	C	I	A	-	Asp	Sr	/	####	
Vstor1	=	10	Fully roofed and/or sealed developments	21.2	0.0345	-	20	100	/	####	
Vstor2	=	10	Asphalt and concrete paved surfaces						/	####	
			Select the Appropriate Surface Description From the Dropdown Menu (Table 1) & this will in Turn Input the Appropriate Run-Off Coefficient into the Calculation.	Enter Rainfall Intensity for the Site Location from Appendix (mm/hr)	Enter Area of the Catchment discharging to the soakpit (hectares); eg; 750m² = 0.075ha		Enter Area of Base of soakpit (m²)	Enter Soakage Rate (mm/hr) From Field Testing Provided by the Applicant (Refer Clause 9.0.2)			
Vstor1	=		6.5			-	2				
Vstor2	=		0			-	0				
Vstor	=		4.5826	m³							
				NOTE:	Where the soak pit comprises a rock filled hole then the volume available for storage shall be taken as 0.38 times the volume of the hole (Refer Clause 9.0.6)						
Vstor	=		12.06	m³	For rock filled soakpits						

How to Use the Calculator:
Enter required data into the 'Red' fields, following the guidance information under each cell. Noting that two lines are provided for situations where more than 1 surface type exists. The calculator will automatically do the rest!

Here's the answer.

SAMPLE ONLY

If you nominate E1/VM1 as your means of compliance then you will be required to provide percolation testing to achieve compliance with that document.

Any deviation from that process would become an Alternative Solution, requiring evidence and supporting documentation to 'satisfy on reasonable grounds' that the Alternative Solution, when installed, will comply with the functional and performance requirements of NZBC Clause E1.

b) Alternative solution

An Alternative Solution to comply with E1 for the sizing of your soak pits, could include the following:

1. Adopting 'zero soakage' into the sizing calculation which will provide the soak pit size for the worst case scenario.
2. Information on soil types and rainfall are available from ECAN which can help with this assessment.
3. When testing has been done across several sites within the same subdivision these results could be calibrated to a 'worst case' or 'best average' for sizing of soak pits in that immediate area.
4. The results of any percolation testing completed by the developer at the time of subdivision could also be utilised to provide additional supporting information to how the soak pits are sized.

Driveway runoff

In line with the NZBC requirements for E1 Surface Water, stormwater runoff from a driveway must be collected and disposed of via an approved outfall.

An approved outfall could be a soak pit (located within the property boundary), a kerb and channel outlet, or a reticulated system (found in some sub-divisions).

Alternatively, the driveway may be formed with direction of fall sufficient to contain the storm water within the property and prevent the run-off entering any buildings on the same site.

Where a kerb and channel outlet is available, driveway stormwater can be directed to a road **provided it does not flow over a footpath.**

Proposed stormwater drainage plans should include site levels showing datum points for the kerb and the building's finished floor level; this is to enable our processing team to assess the direction of fall and whether containment on the property can be achieved.

The examples below provide guidance on what SDC will take into consideration when determining what your property requires to deal with water runoff.

Example 1

Drive (hardstand) stormwater runoff is permitted to run on to the road if a kerb and channel provision is available and the runoff does not cross a foot path – refer picture below.

Example 2

If the run off crosses a footpath driveway stormwater collection will be required – via drainage strip, sump etc – refer picture below.

Vehicle Crossings

It is an SDC requirement to form and seal all vehicle crossings. This will be inspected as part of Practical Completion/Final Inspection prior to issue of CCC.

For details on vehicle crossing prerequisites please refer to the Vehicle Crossing Information Pack on our website.

Sump lids for runoff

A key safety criteria for consideration is whether the sump lid 'lifts'. This could be caused by surcharging or any other lid disturbance events.

As a BCA we have a moral responsibility for safety and ask that sump lids be installed in such a manner that they will not be dislodged easily or flip over.

Further details on the Legislation relating to E1 Surface Water can be viewed at https://www.building.govt.nz/building-code-compliance/e-moisture/e1-surface-water/. You will find the NZ Building Code (legislative requirement) at the beginning of the section with the Verification Method (VM1) and Acceptable Solution (AS1) documents in the pages following.